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Environmental Assessment

Grand Mesa National Forest Mechanized (Mountain Bike) Travel Restriction

Grand Valley Ranger District, Grand Mesa, Uncompahgre and Gunnison National
Forests
Mesa and Delta Counties, Colorado



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Grand Mesa National Forest Mechanized Travel Restriction

**Environmental Assessment
Mesa and Delta Counties, Colorado**

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SUMMARY

The Grand Mesa, Uncompahgre and Gunnison National Forests propose to restrict mechanized travel to designated trails. The area affected by the proposal includes only the Grand Mesa National Forest as managed by the Grand Valley Ranger District. This action is needed to address a recreation niche that was overlooked in previous analyses; prevent continued resource damage from a proliferation of user-created routes; and, further, identify a base system of routes that can be built upon in the future as resource protections, funding and user group cooperation allow.

There is a history of travel management decisions and restrictions on the Grand Mesa National Forest. Recently it was noted that a new situation was occurring that was not adequately addressed in any of the previous travel analysis regarding non-motorized, mechanized travel. The GMUG recognizes mechanized travel such as mountain biking as a desirable non-motorized recreational experience. This analysis provides the GMUG the opportunity to disclose the effects of restricting mountain bike (and other mechanized equipment) use to an existing and/or proposed system of routes.

As part of the public involvement process, the GMUG sent out approximately eighty letters with maps to interested parties, user groups, businesses, and Local, State, Federal and Tribal entities; sent press releases to all area newspapers (at least three published); provided a radio interview (KVNF); and posted information to the GMUG's website. Twenty-five comments were received primarily from mountain bikers and associated groups. The key issues brought forward relate to safety and user experience.

These issues led the agency to develop alternatives to the proposed action including:

- No Action Alternative- Mechanized travel allowed to continue cross-country anywhere on the Grand Mesa National Forest.
- Alternative 1 (Proposed Action)-Restrict mechanized travel to existing routes (addresses resource concerns).
- Alternative 2 Restrict mechanized travel to existing routes and authorize approximately 26.9 miles of new mechanized routes (addresses resource concerns and user experience).
- Alternative 3- Restrict mechanized travel to existing routes, authorize approximately 26.9 miles of new mechanized routes and add seasonal closures in the Kannah Creek area (addresses resource concerns, user experience and safety).

Implementing any of the action alternatives would result in fewer impacts to natural and physical resources while still addressing recreation demand.

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

- Whether or not to restrict mechanized travel to designated routes; and
- If mechanized travel is restricted to designated routes, decide which alternative (or combination of alternatives) to implement.

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CHAPTER 1. PURPOSE OF AND NEED FOR ACTION

1.0 Document Structure

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

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

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

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

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

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at Grand Valley Ranger District Office, Grand Junction, Colorado.

1.1 Grand Mesa Travel Restriction History

There has been extensive analysis done regarding travel management on the Grand Mesa National Forest as described below.

In December 1994, the Forest Supervisor of the Grand Mesa, Uncompahgre, and Gunnison National Forests (GMUG) signed a Decision Notice and Finding of No Significant Impact which changed travel management on the Grand Mesa National Forest from cross-country travel to travel on designated routes only and further identified the routes that were to be open or closed to motorized travel.

The Decision Notice/Finding of No Significant Impact was appealed by several individuals and groups, including the Colorado Off-Highway Vehicle Coalition (COHVCO). As required by regulation, informal disposition meetings were held to seek to resolve the appeals. A Settlement Agreement was reached between the Forest Supervisor and COHVCO. The Forest committed to "evaluate re-opening to motorized recreation use: a) 100 miles of the 299 miles of non-system trails closed in the 1994 decision, and b) those water user access roads and trails in the Grand Mesa National Forest necessary to access their water facilities.

The Forest Service began the subsequent analysis in late 1995. An Environmental Assessment was published in December 1996 which analyzed reopening 101.7 miles of routes. Upon review of comments, the Forest Supervisor directed the District to complete a comprehensive route-by-route study in 1997.

In late 1999, after two years of working with local motorized groups, water users and citizens, a proposed action that met the spirit of the settlement agreement was sent out again for public comment. During this time, the team was confronted with several new challenges and policy direction which required new and additional analysis to support a decision. An Environmental Assessment was issued in August of 2002 and sent out for public comment. In December 2003 a Decision Notice & Finding of No Significant Impact was signed to implement the *Grand Mesa Travel Management Plan* (a.k.a. "100 Mile EA").

Additional travel restrictions were considered in relation to big game. In April 2004 a second Decision was signed to allow the *Grand Mesa, Uncompahgre and Gunnison National Forests Amended Land and Resource Management Plan* to be amended based on the 2003 decision for elk habitat effectiveness reduction.

In the fall of 2005, after 10 years of monitoring impacts associated with off-route game retrieval in the 1994 decision, motorized downed-game retrieval with all terrain vehicles (ATVs) off of designated routes was discontinued on the Grand Mesa National Forest. This also aligned the Grand Mesa National Forest with both the Uncompahgre and Gunnison National Forests.

Although the focus of the above travel plans were related to motorized travel, the plans also documented the need to provide recreation opportunities for other users. The 1994 decision identified 25 lakes and/or reservoirs, primarily in the Griffiths/Bull Creek Area that would be managed as "Walk-In-Fisheries". In addition to the Crag Crest National Recreation Trail, the Mesa Lakes and Ward Creek Trail Systems were identified for Hiking. The plans also identified the historical use and the importance to continue management of the Kannah Creek Basin Area to provide a "primitive back county experience" with an emphasis on equestrian use.

During the late 1980's and early 90's, a large system of Mountain Bike Trails were being developed and promoted on BLM lands throughout the Grand Valley, most notably the Kokepelli Trail. As the popularity and use of Mountain Bikes grew in the valley, the interest in finding places to ride on the Grand Mesa, especially during the "heat" of the summer, also began to increase. However, at the time in which the 1994 travel plan was being developed, mechanized travel (mountain bike) opportunities and use across the Grand Mesa was fairly limited. As a result of local publications and informal promotions, the majority of mountain bike use atop the Grand Mesa occurred on the Lands End/Anderson Road loop and the West Bench Trail out of the Mesa lakes area.

As interest in mountain bike use on the Grand Mesa National Forest increased, the ranger district began exploring areas to accommodate future mountain bike growth. Based on accessibility, sustainability, and to provide a non-motorized single track experience which would not conflict with other historic uses, the district began to look at the Flowing Park and Scales Lake areas for possible future developments. The district felt that the elevation and terrain of these areas provided the best alternatives for mountain bike use in the middle of the

summer when valley temperatures were most limiting and also provided opportunities for the development of trails for a “family” experience.

Since the development of the initial travel plan, there have been significant technological advances in the design of mountain bikes as well as the development of new “specialty” bikes to provide for a range of interests. These advances have allowed a greater number of mountain bikers to access areas that were seldom used or used previously by only the most advanced riders. The design of new bikes for specific experiences (i.e. “free riding”) has resulted in the creation of new routes to meet the specific desire of the new use.

The GMUG recognizes mechanized travel such as mountain biking as a desirable non-motorized recreational experience. Much of the existing Grand Mesa National Forest transportation system was designed around access for timber harvest, range management and water developments. Historically, the transportation system has been “adopted” for recreational use instead of being “designed” with recreation as its primary focus; therefore, most recreational user groups feel that the system does not fully meet their particular recreational desires. This analysis provides the GMUG the opportunity to disclose the effects of restricting mountain bike (and other mechanized equipment) use to an existing and/or proposed system of routes.

Certain areas of the Grand Mesa National Forest fill specialized recreation niches like Kannah Creek Basin which is a hub for semi-primitive non-motorized equestrian recreation opportunities. This is an area where different non-motorized management activities may conflict. It is felt that mechanized travel on the Grand Mesa may also have a unique recreation niche just as the equestrian use and motorized uses do in other areas of the forest. This niche has been identified during the development of alternatives with the public and is further discussed in Chapter 2.

1.2 Purpose and Need for Action _____

The GMUG has identified a need to require non-motorized, mechanized use to travel on designated routes only on the Grand Mesa National Forest. The purpose of the agency’s action is to address a mode of travel that was silent in previous analyses; prevent continued resource damage from a proliferation of user-created routes; and, further, identify a system of routes that can be built upon in the future as resource protections, funding and user group cooperation to address future demand for mechanized travel.

The project responds to the general direction outlined in the *Amended Land and Resource Management Plan Grand Mesa, Uncompahgre and Gunnison National Forests* (1991) (GMUG LRMP) by providing for non-motorized recreation opportunities and aligns with other travel management proposals and decisions (Gunnison National Forest and Uncompahgre National Forest) on the GMUG.

1.3 Proposed Action _____

The action proposed by the Forest Service to meet the purpose and need is to restrict non-motorized, mechanized travel to designated routes on the Grand Mesa National Forest, Colorado. The proposed restriction would also prohibit use of mechanized transport on

designated non-motorized winter (over-snow) areas. Three action alternatives have been developed to meet this need and are described in detail in Chapter 2.

1.4 Decision Framework ---

Given the purpose and need, the authorized officer reviews the proposed action, the other alternatives, and the environmental effects in order to make the following decisions:

- Decide whether or not to restrict mechanized travel to designated routes; and
- If mechanized travel is restricted to designated routes, decide which alternative (or combination of alternatives) to implement including approval of new trails, if applicable.

1.5 Authorizing Actions ---

1.5.1 Laws

National Trails System Act (82 Stat. 919, as amended, 16 U.S.C. 1241 (Note), 1241-1249) establishes a National Trail System containing national recreation, scenic, historic, and connecting or side trails for the purpose of providing trail recreation opportunities. It prescribes administrative and development matters and encourages the use of volunteers in the trail program. It also establishes provisions for agreements to carry out the purposes of the act.

National Forest Roads and Trails Act (78 Stat. 1089, as amended; 16 U.S.C. 532-538) recognizes that construction and maintenance of an adequate system of roads and trails within and near the National Forest is essential to meeting the increasing demands for timber, recreation, and other uses. It authorizes and establishes procedures related to right-of-ways, easements, construction, record keeping, and agreements.

1.5.2 Regulations

Travel Management (36 CFR Part 212, Subparts A, B, and C) Subpart A establishes requirements for administration of the forest transportation system, including roads, trails, and airfields, and contains provisions for acquisition of rights-of-way; Subpart B describes the requirements for designating roads, trails, and areas for motor vehicle use and for identifying designated roads, trails, and areas on a motor vehicle use map (MVUM); and Subpart C provides for regulation of use by over-snow vehicles on NFS roads, on NFS trails, and in areas on NFS lands.

Prohibitions section (36 CFR Part 261) establishes prohibitions necessary to manage and control use on a National Forest System road or trail. It includes general prohibitions and prohibitions in areas designated by order. It is anticipated that to implement this decision a Forest Order would be necessary citing this CFR.

1.5.3 Policy

Forest Service Handbook (FSH) 2309.18 (11, 12) (WO Amendment 2309-18-2008-3)

Plan and develop trails based on decisions documented in the applicable land management plan.

Many of the general objectives for trails are in the applicable land management plan or in more detailed travel management decisions.... Recognize the need for more detailed analysis when resource conditions change, new recreation opportunities are discovered, conflicts among uses arise, or new public issues emerge.

Forest Service Manual (FSM) 2353.02

1. Provide trail-related recreation opportunities that serve public needs and meet land management and recreation policy objectives.
2. Provide trail recreation opportunities that emphasize the natural setting of the National Forest and are consistent with land capability.

FSM 2353.03 (2, 3, and 4)

Provide a diversity of trail opportunities for experiencing a variety of environments and modes of travel consistent with the National Forest Recreation role (FSM 2302 and 2303) and land capability.

FSM 7712

Conduct transportation analysis at appropriate scales using the best available science that considers access needs and concerns. Coordinate the analysis with other ecosystem assessments and analyses.

FSM 7712.02

The objectives of transportation analysis are as follows:

1. To identify transportation management opportunities and priorities.
2. To assess transportation management needs, long-term funding, and expected ecosystem, social, and economic effects.
3. To establish transportation management objectives and priorities.

FSM 7712.03

Forest Service regulations implementing the Forest and Rangeland Renewable Resources Planning Act, as amended by the National Forest Management Act, require integration of transportation planning into an interdisciplinary effort that produces Regional, Forest, and site-specific project plans. In planning for and analyzing the transportation system, perform the following:

1. Assess economic costs and benefits along with social and ecological factors when identifying forest transportation facility options.
2. Assess effects of forest transportation facility options on ecological processes and ecosystem health, diversity, and productivity.
3. Consider the needs of all parties when developing transportation system opportunities in areas of intermingled ownership.

4. Consider long- and short-term uses, including possible mechanized, non-mechanized, and off-highway vehicle uses, when analyzing forest transportation facilities.
5. Actively engage the public in transportation analysis.

1.5.4 Forest Plan Direction

The Amended LRMP, dated September 1991, for the GMUG National Forests is consistent with the proposed action for the protection of soils, vegetation and wildlife habitat by restricting non-motorized, mechanized travel to designated routes. The LRMP also provided for applicable stipulations to be utilized for protection of specific surface resources as addressed in Section III, pages 9a-200; however, none of these were specific to non-motorized, mechanized travel.

The Forest Plan guides natural resource management activities and establishes management standards and guidelines for the GMUG. The following multiple use management area prescriptions are designated for the Grand Mesa National Forest:

1B - Emphasis on ski area. Management integrates ski area development with resource management to provide healthy tree stands, vegetation diversity, forage production for wildlife/livestock and opportunities for non-motorized recreation.

2A- Emphasis is on Semi-primitive motorized recreational activities in a natural appearing environment. Range management minimizes conflicts between recreationists and livestock. Vegetation treatment enhances diversity.

2B- Emphasis is on roaded natural and rural recreation opportunities. Major travel routes maintain or improve visual quality. Range management minimizes conflicts between recreationists and livestock. Vegetation treatment enhances visual quality, recreation setting and diversity.

3A-Emphasis is on semi-primitive non-motorized recreation opportunities. Vegetation treatment enhances visual quality and diversity. User density is controlled by access.

4B- Emphasis is on wildlife habitat management for management indicator species. Semi-primitive non-motorized, Semi-primitive motorized and roaded natural recreation opportunities are provided. Livestock grazing is compatible with wildlife habitat management. Vegetation treatment enhances diversity.

4D- Emphasis is on aspen management. Area is managed to maintain or improve aspen and provide wood fiber, wildlife habitat, visual quality and diversity. Semi-primitive non-motorized, Semi-primitive motorized and roaded natural recreation opportunities are provided. Livestock grazing is compatible.

5A- Emphasis is on big-game winter range in non-forested areas. Semi-primitive non-motorized, Semi-primitive motorized and roaded natural recreation opportunities are provided. Vegetation treatment enhances diversity. Livestock grazing is compatible, but favors wildlife habitat.

6B – Emphasis is on management for livestock grazing. Range condition is maintained through use of forage improvement practices, livestock management, and

regulation of other resource activities. Motorized recreation on roads is to prevent stress on big-game animals. Vegetation treatment enhances diversity.

7A- Emphasis is on timber production on slopes less than 40%. Semi-primitive motorized and roaded natural recreation opportunities are provided. Vegetation treatment enhances diversity.

1.6 Public Involvement ---

The Notice of Opportunity to Comment was published in the *Grand Junction Daily Sentinel* on January 12, 2009. The Notice of Opportunity to Comment asked for public comment on the proposal from January 12 to February 12, 2009. In addition, as part of the public involvement process, the GMUG sent out approximately eighty letters with maps to interested parties, user groups, businesses, and Local, State, Federal and Tribal entities; sent press releases to all area newspapers (at least three published); provided a radio interview (KVNF); and posted information to the GMUG's and to Agency's Schedule of Proposed Actions websites. Twenty-five comments were received primarily from mountain bikers and associated groups.

Using the comments from the public, user groups, other agencies, and GMUG staff, the interdisciplinary team developed a list of issues to address. Other comments received were addressed in Section 2.2 Alternatives Considered but Eliminated from Detailed Study or in the project file.

1.7 Issues ---

The Forest Service separated the issues into two groups: key and non-key issues.

1.7.1 Key Issues

Key issues were defined as those directly or indirectly caused by implementing the proposed action. The Forest Service identified the following internal and external key issues during scoping:

Table 1.7.1. Key Issues.

Resource Element	Issue	Where Addressed
Safety	Non-motorized, mixed-use on steep trails (especially in limited sight-distance areas like Kannah Creek, Battlements and other downhill experience area where speeds can be excessive) creates a safety hazard for other users, particularly equestrian users.	Alternative 3 has, in part, been developed to address this safety issue.
User Experience	By restricting mechanized travel to designated routes, differing user groups, based on the GMUG's travel hierarchy (see Chapter 2 for definition), may experience conflicts over routes.	All alternatives recognize the difference in user expectations and desired experiences. Alternative 3 addresses user conflicts. Refer to Chapter 3, Environmental Effects.

1.7.2 Non-key Issues

Non-key issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." Non-key issues are addressed below. Comments received from the public and how they were addressed in this analysis are included in the project file.

Table 1.7.2. Non-key Issues.

Resource Element	Non-key Issue	Why Issue Is Not Addressed in this document
Recreation Opportunity	Address winter travel on the Grand Mesa National Forest in a timely manner.	Winter Travel is outside the scope of this decision.
	The scope of the EA should be broadened to include single track motorized experiences.	Single track motorized (motorcycle) experiences are outside the scope of this analysis. All terrestrial motorized travel on the Grand Mesa has already been addressed in previous NEPA decisions (2004 Decision) where it was felt that this recreation niche had many locally available opportunities on the Uncompahgre National Forest and other public lands. New system motorcycle trails would be considered in a separate analysis if proposed and funded (surveys, NEPA, construction, continued maintenance).
	Opportunity for mountain biking is being reduced unfairly compared to other user groups' (motorized) opportunities.	Each use has been considered individually. Several NEPA endeavors and Travel Rules between 1994 and 2005 have restricted motorized use on the Grand Mesa National Forest to designated routes. This EA is responding to a need that has occurred since those NEPA decisions have been implemented. Mountain bikes <u>are</u> allowed on all summer motorized and non-motorized trails except for those hiking trails specifically prohibiting their use (including hiker only trails which also prohibit horses).
User Experience	Motorcycles and ATVs impact trails used by mountain bikes by loosening the soil, generating washboards and ruts and widening the trail.	Motorcycle/ATV impacts to trails open to motorized vehicles is outside scope of this analysis and has already been considered in previous NEPA analysis.

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CHAPTER 2. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.0 Introduction ---

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

To clarify this proposed action and subsequent analysis the following definitions will be used:

Mechanized travel is described in this document as any non-motorized vehicle defined as “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). To clarify, mechanized vehicles are human-powered means of transport generally with some type of wheeled, mechanized device. Examples include, but are not limited to, bicycles, mountain bikes, unicycles, and tricycles. This mechanized definition does not apply to “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 261.2).

Travel hierarchy allows multiple types of travel on the same route even if certain uses are not recommended or provide desired user experience. For example an ATV trail is open to motorcycles, mountain bikes, horses and hikers although it may have been designed for use by ATVs. The GMUG’s travel hierarchy is generally described as follows:

Type of route*	Open to							
	Passenger vehicles	Full-sized high clearance	Jeep (Off Highway Vehicle >50" wide)	ATV (Off highway vehicle < 50" Wide)	Motorcycle (Single track motorized)	Mechanized (Single track non-motorized, currently envisioned as a mountain bike)	Horse	Hiker
Road	√	√	√	√	√	√	√	√
Jeep trail			√	√	√	√	√	√
ATV Trail				√	√	√	√	√
Single track motorized					√	√	√	√
Bike trail (single track non-motorized)						√	√	√
Hiking/horse trail							√	√
Hiking trail								√

2.1 Alternatives Considered in Detail

The GMUG recognizes mechanized uses, including mountain biking as a desirable non-motorized recreational experience. Much of the Grand Mesa National Forest transportation system was designed around access for timber harvest, range management and water developments.

The Forest Service considered, in detail, four alternatives, including the No Action and Proposed Action alternatives, in response to issues raised internally and by the public.

The development of the alternatives considered previous travel management decisions, management emphasis areas, and future opportunities:

- Previous travel management NEPA decisions have encouraged all non-motorized users to stay on designated system routes. Designated system routes are those routes the Forest Service identifies, numbers, establishes a maintenance level (and therefore a fiscal obligation), and signs as a designated route; thereby encouraging use by the public.
- It was noted in the December 2003 decision that the following areas were considered for non-motorized recreational opportunities: Scales Lake area, Flowing Park and Indian Point, Flattops, Kannah Creek area and Griffiths/Bull Creek/West Bench areas.
- Certain areas of the Grand Mesa National Forest fill specialized recreation niches like Kannah Creek Basin which is a hub for primitive and semi-primitive non-motorized

* May include exceptions under each mode of travel depending on site-specific conditions.

equestrian recreation opportunities. This area is an area where different non-motorized management activities may conflict.

Alternative 1 only considers existing system routes as they relate to previous NEPA decisions. However, Alternatives 2 and 3 are based on consideration of items above and trying to address recreation demand for mechanized use. Under these alternatives, the “Scales Lake Complex” evolved as true opportunity for summer mechanized travel. Because the climate is mild in the Grand Valley, there is a long season and vast opportunity for mechanized travel on nearby public lands. However, during the hot summer months more users seek the cooler high country on top of Grand Mesa. The Scales Lake Complex includes old logging routes which have been receiving some use by mechanized users. Not all routes were considered sustainable due to other environmental concerns primarily associated with wet areas. The Scales Lake Complex also includes loops of various length and difficulty which appeal to more diverse user groups such as families. The “Flowing Park Area” is also considered for additional opportunity to connect existing and under-construction system mechanized routes to the Mesa Top trailhead to make use of existing facilities and create additional and sometimes more challenging loop opportunities.

Alternative 3 goes a step further and considers the Recreational Opportunity Spectrum particularly as it relates to Kannah Creek Basin, what our management emphasis has been historically (backcountry/primitive/semi-primitive with equestrian use and horse camps in the fall), and how an increase in mechanized use may contribute to conflicts of historical uses.

2.1.1 No Action Alternative

Under the No Action alternative, current Travel Management Plans would continue to guide management of the project area. Mechanized uses would continue to occur throughout the Grand Mesa National Forest without specific direction. This alternative would not be consistent with current National policy and direction and other travel management plans on the GMUG.

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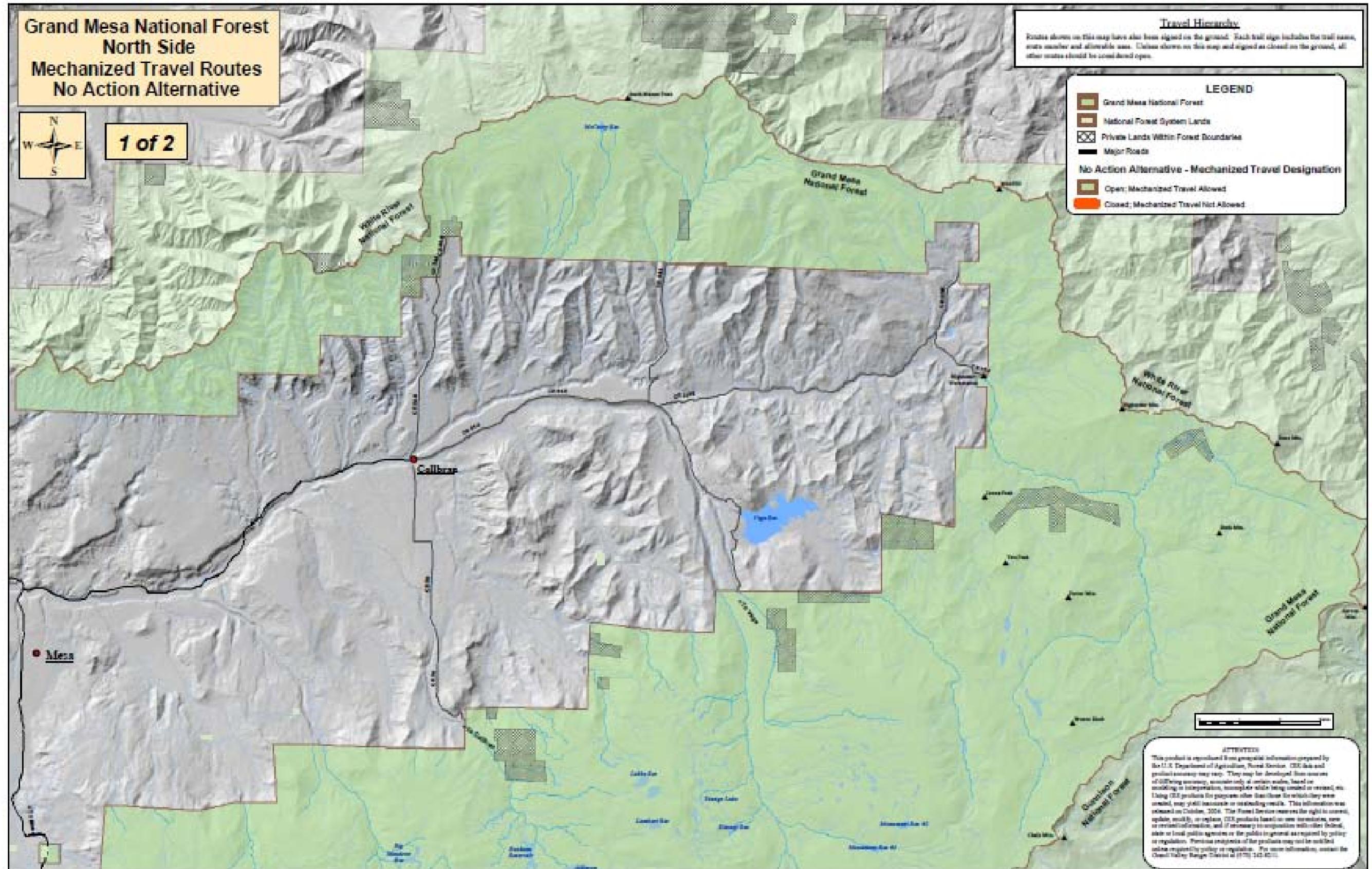


Figure 1. No Action Grand Mesa North.

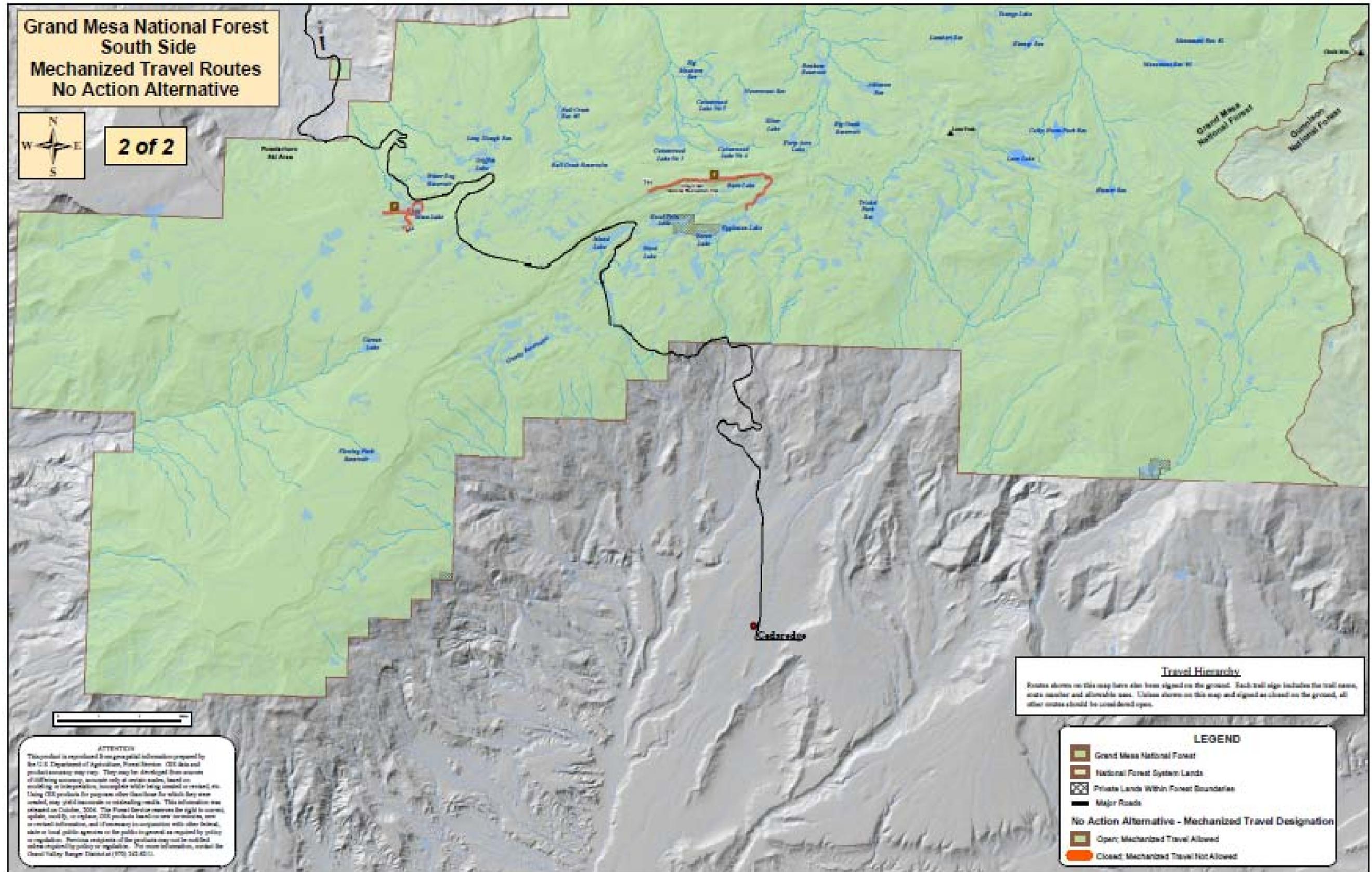


Figure 2. No Action Grand Mesa South.

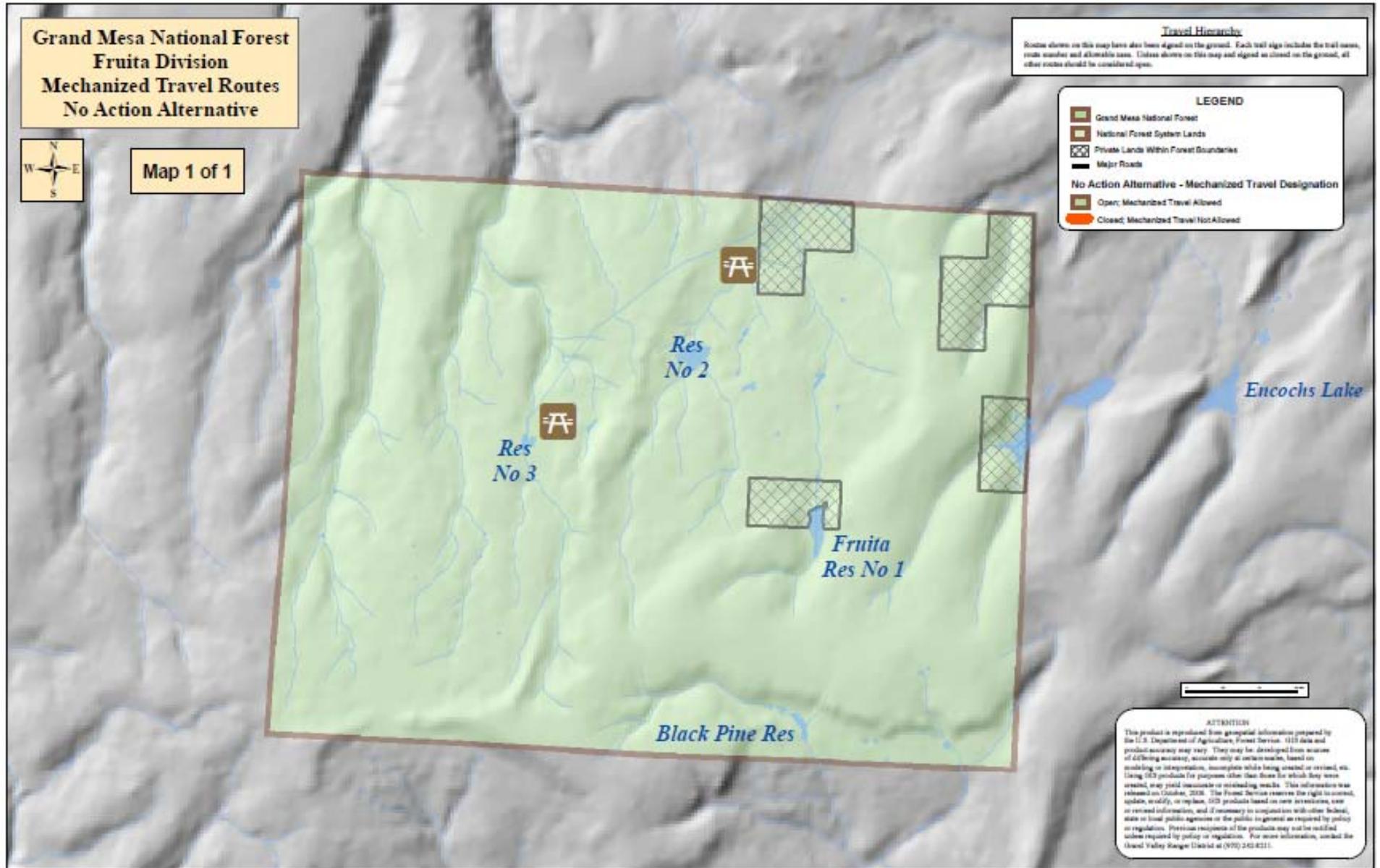


Figure 3. No Action Fruita Division.

2.1.2 Common to All Action Alternatives

The FS proposes to restrict non-motorized, mechanized travel (including “mountain bikes”) to designated routes. Restrictions would apply on the Grand Mesa National Forest, Colorado. Designated routes are defined as those numbered motorized routes that appear on the *Grand Mesa National Forest’s Motor Vehicle Use Map* or numbered non-motorized as routes identified in section 3.6 of this document which are portrayed on official *Visitor Use Maps*. The following applies to descriptions generally used in this document:

- *Trail*: A route less than 50” in wide that is identified and managed as a trail.
- *Road*: A motor vehicle route over 50 inches, unless identified and managed as a trail.
- *Route*: A route is defined as a road or trail.

The restriction would also prohibit use of mechanized transport on designated winter (over-snow) trails. Mechanized travel would not be allowed on groomed ski trails.

The routes open to mechanized use on the Fruita Division would be the same for all action alternatives as shown on Fruita Division map.

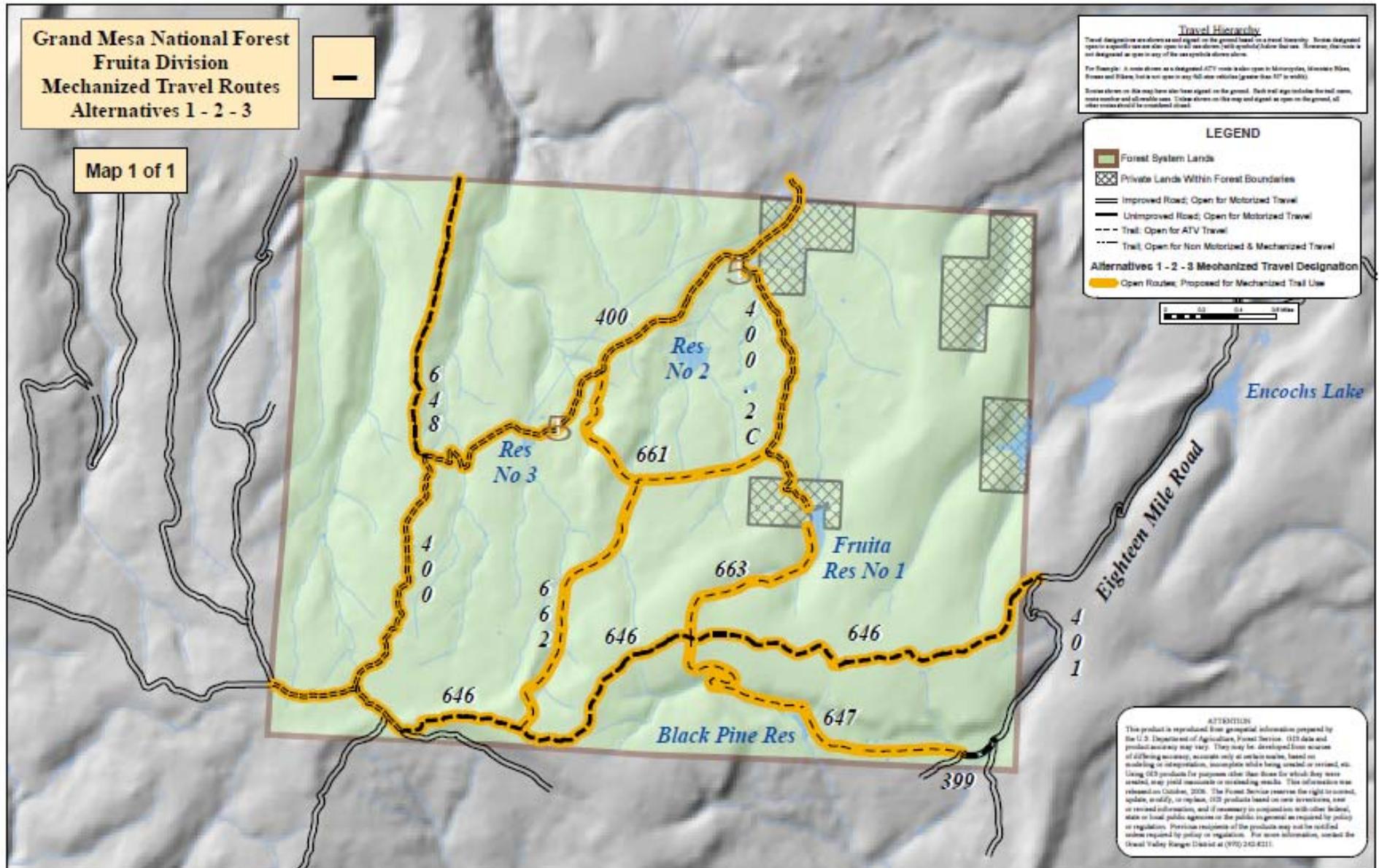


Figure 4. Fruita Division.

2.1.3 Alternative 1 – Proposed Action (Existing Designated Routes)

Routes open to mechanized use would be approximately 306 miles and would include the following:

- Formally restricting mechanized travel to currently designated (National Forest system) routes.
- Hiker only trails (Mesa Lakes, Ward Lake Complex, Crag Crest and others) would not be included (approximately 15 miles) as decisions for these trails have already been issued.
- No off route use would be allowed including those trails currently being utilized that are not “National Forest System” routes.
- Closing/obliterating all existing and future “non-system” or “user-created” mechanized routes would continue to occur.
- Mechanized travel would not be allowed on groomed ski trails during winter season.

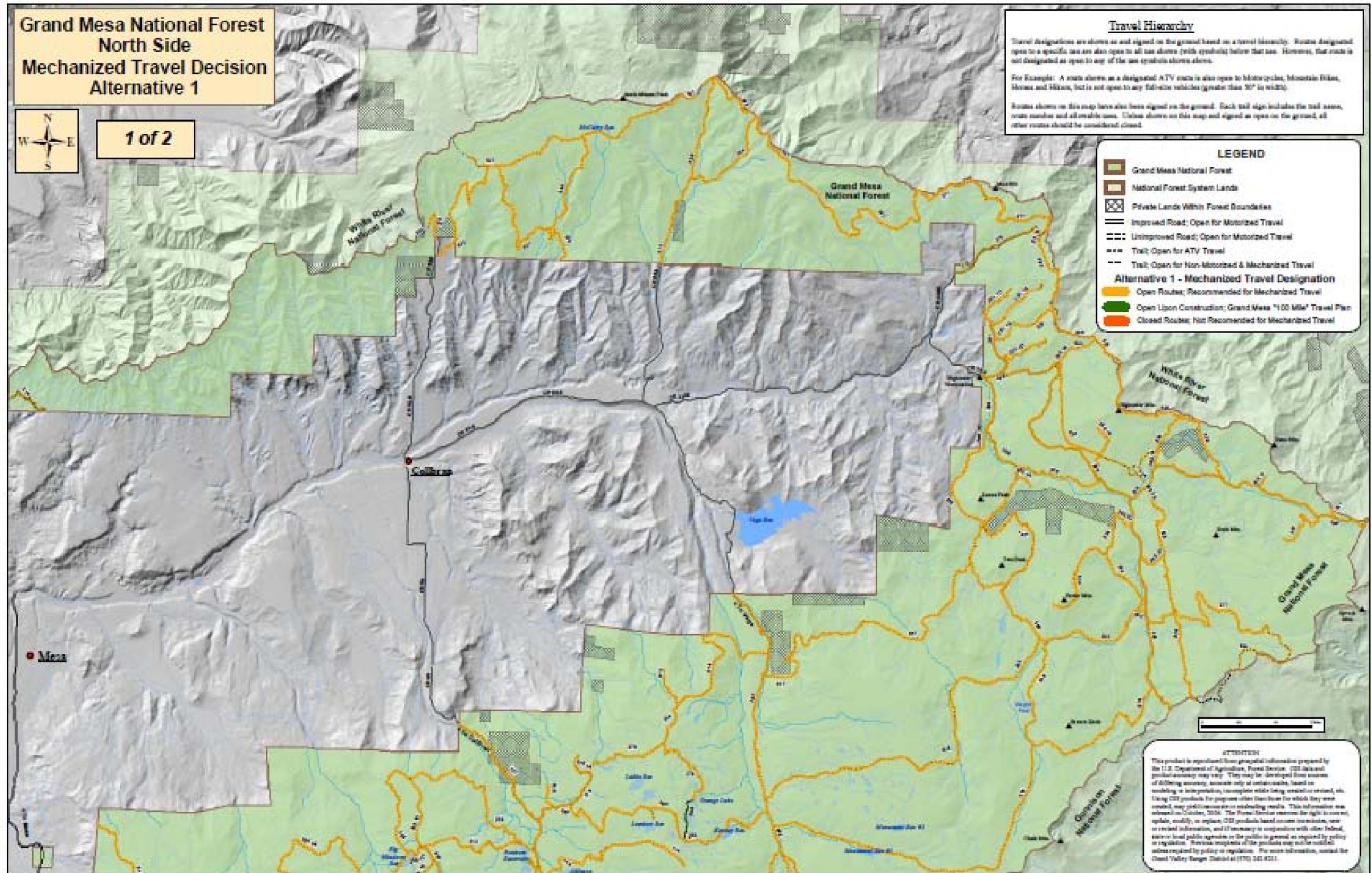


Figure 5. Alternative 1 Grand Mesa North.

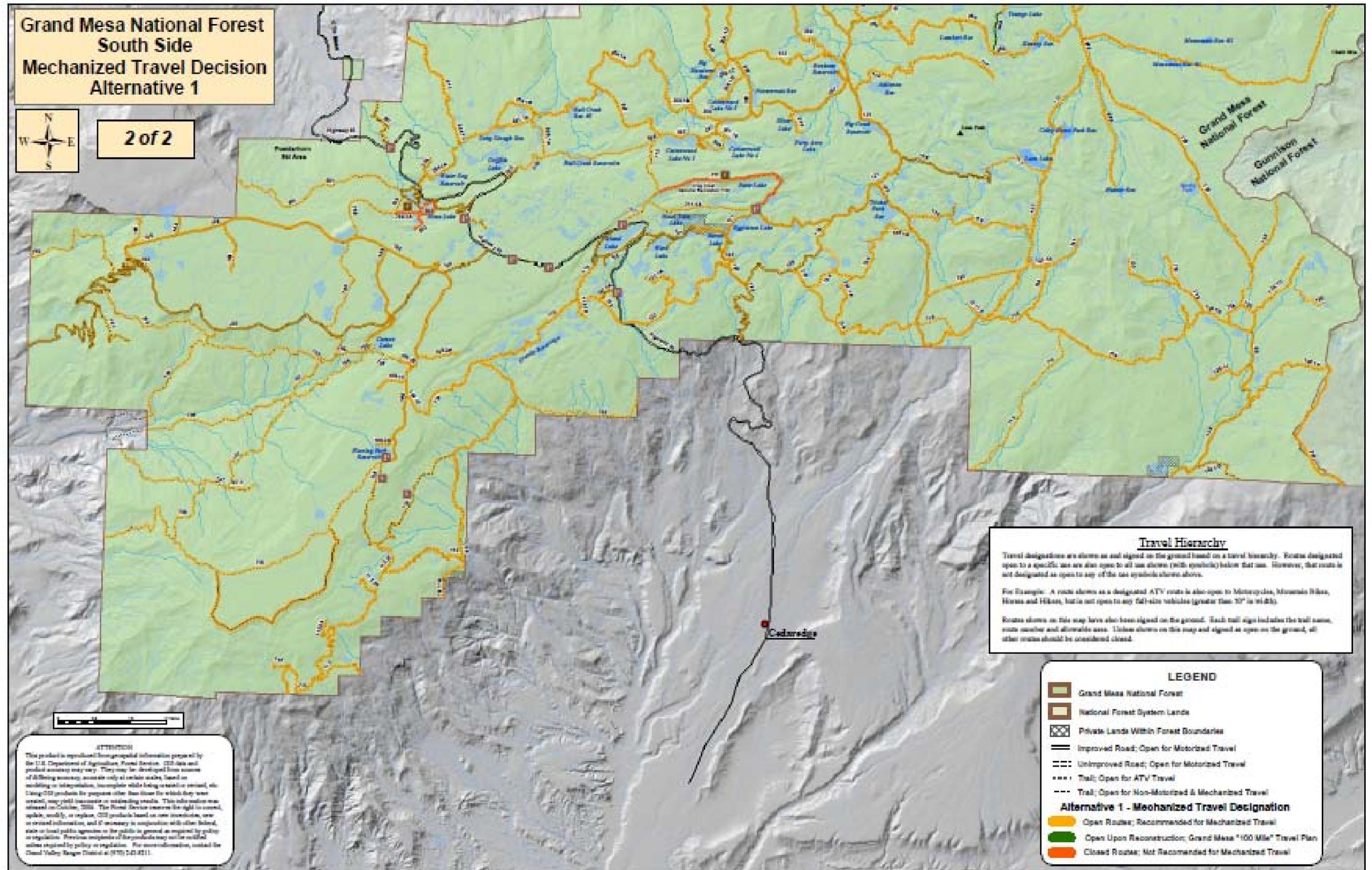


Figure 6. Alternative 1 Grand Mesa South.

2.1.4 Alternative 2 (Additional Routes)

Routes open to mechanized use would include approximately 27* additional miles above Alternative 1.

Alternative 2 would include the following:

- Formally restricting mechanized travel to currently designated routes.
- Designating use of selected Nordic ski trails (approximately 16.1 miles) for summer use by mechanized travel. This area will be referred to as the “Scales Lake Complex”. These routes would not be open until all appropriate surveys and trail work occurred to ensure resource protection and appropriate trail construction specifications are met.
- Constructing approximately 7 miles of new mechanized trails in the Flowing Park Area which includes constructing a connector trail to allow access to Flowing Park area from Mesa Top Trailhead.
- Designating an approximately 3.5 mile-long non-system trail along the Mesa Creek drainage as a non-motorized system trail open to mechanized uses, horses and hikers.
- Hiker only trails (Mesa Lakes, Ward Lake Complex and Crag Crest) would not be included (approximately 15 miles) as decisions for these trails have already been issued.
- Closing/obliterating of all existing and future “non-system” or “user-created” mechanized routes would continue to occur.
- Mechanized travel would not be allowed on groomed ski trails during winter season.

* Note the scoping notice had a decimal point in the wrong place which made this number significantly higher.

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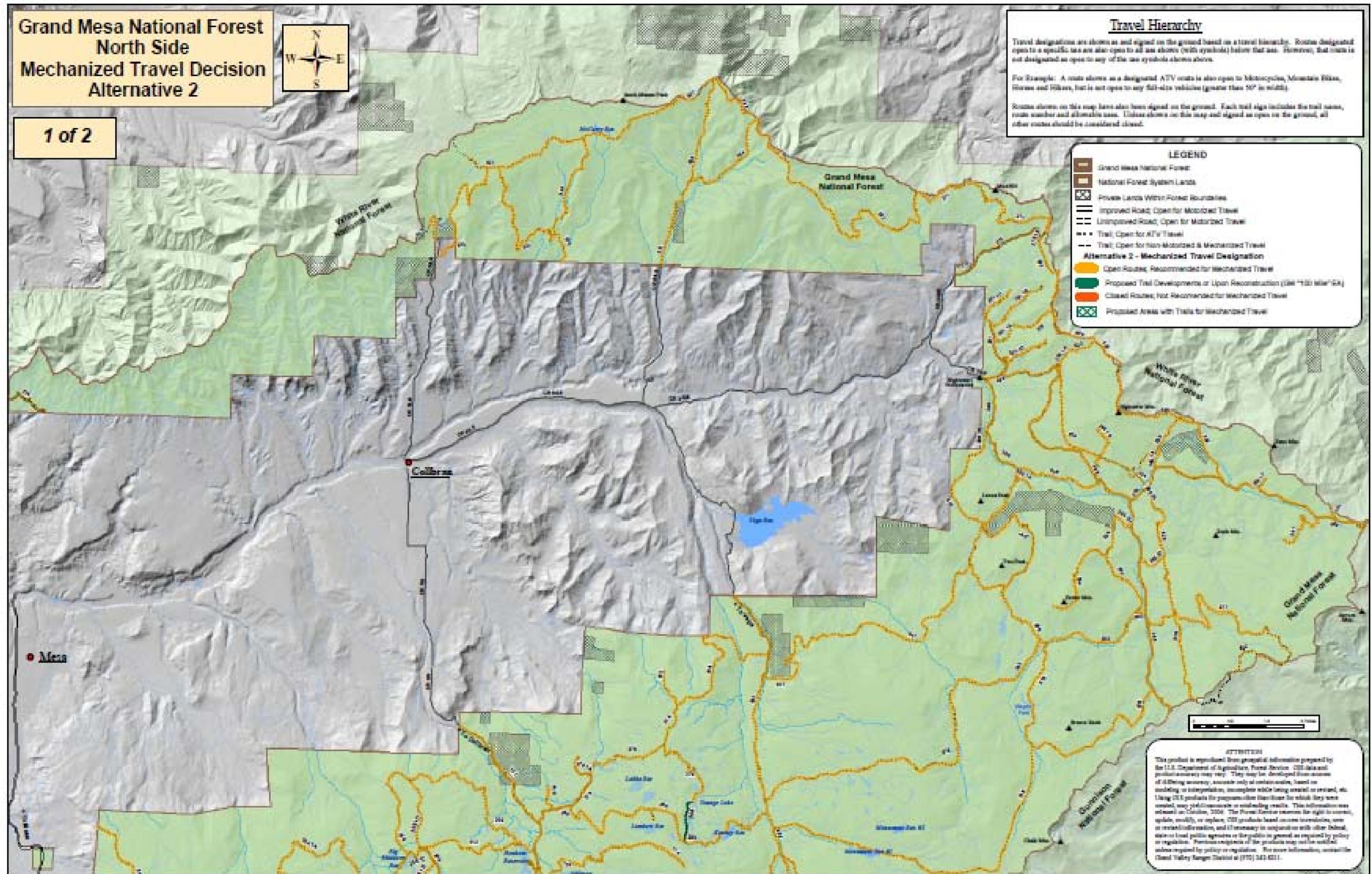


Figure 7. Alternative 2 Grand Mesa North.

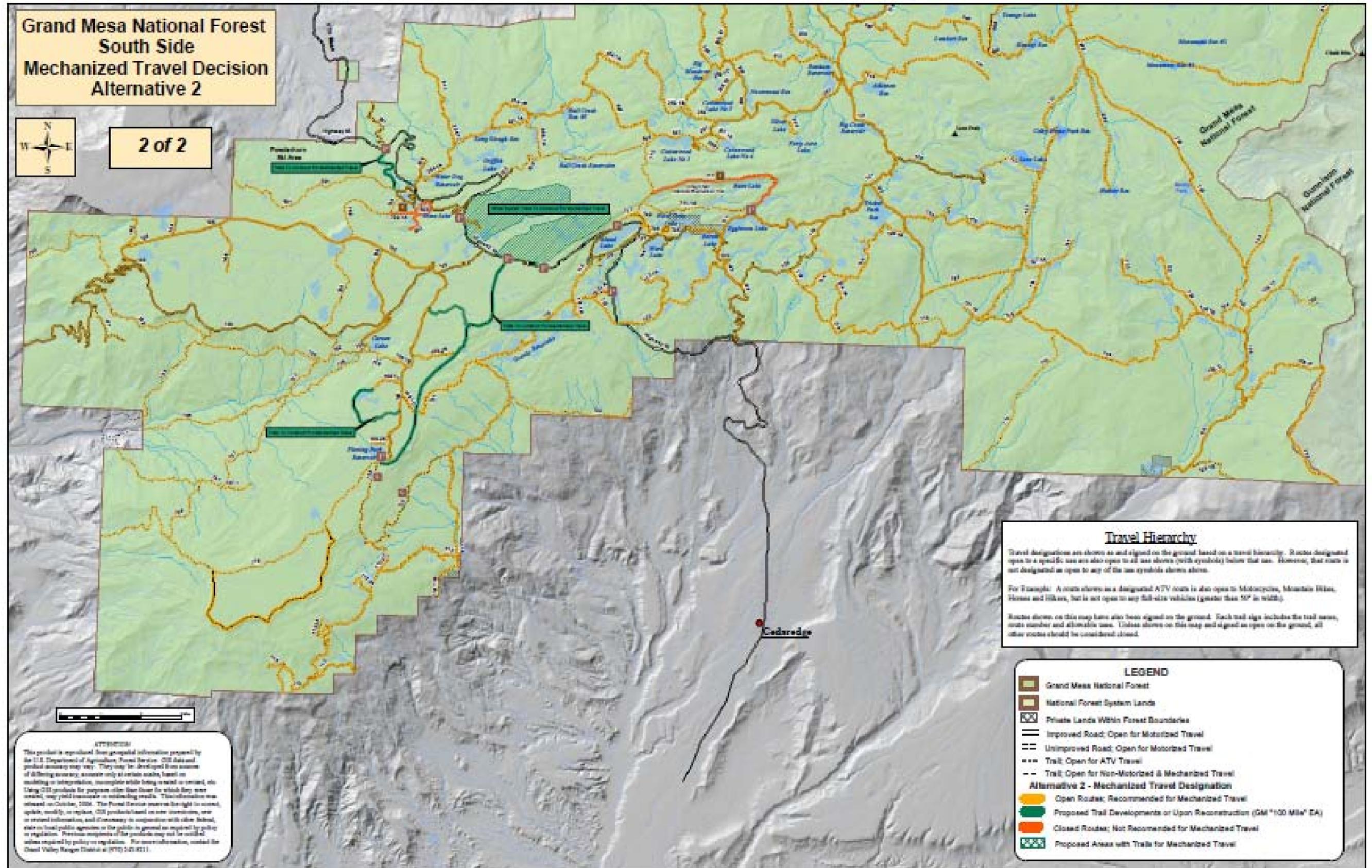


Figure 8. Alternative 2 Grand Mesa South.

2.1.5 Alternative 3 (Additional Routes with Seasonal Restriction)

Alternative 3 is similar to Alternative 2 in miles of routes open to mechanized use and new trails except would include the following additional restriction: Implement seasonal trail restriction to mechanized travel within the Kannah Creek Basin during the fall season when equestrian use is the heaviest (approximately October 1 annually) for the safety of both user groups and to preserve the management emphasis of semi-primitive backcountry. This seasonal restriction would affect approximately 34 miles of trail in the 23,000 acre Kannah Creek Basin.

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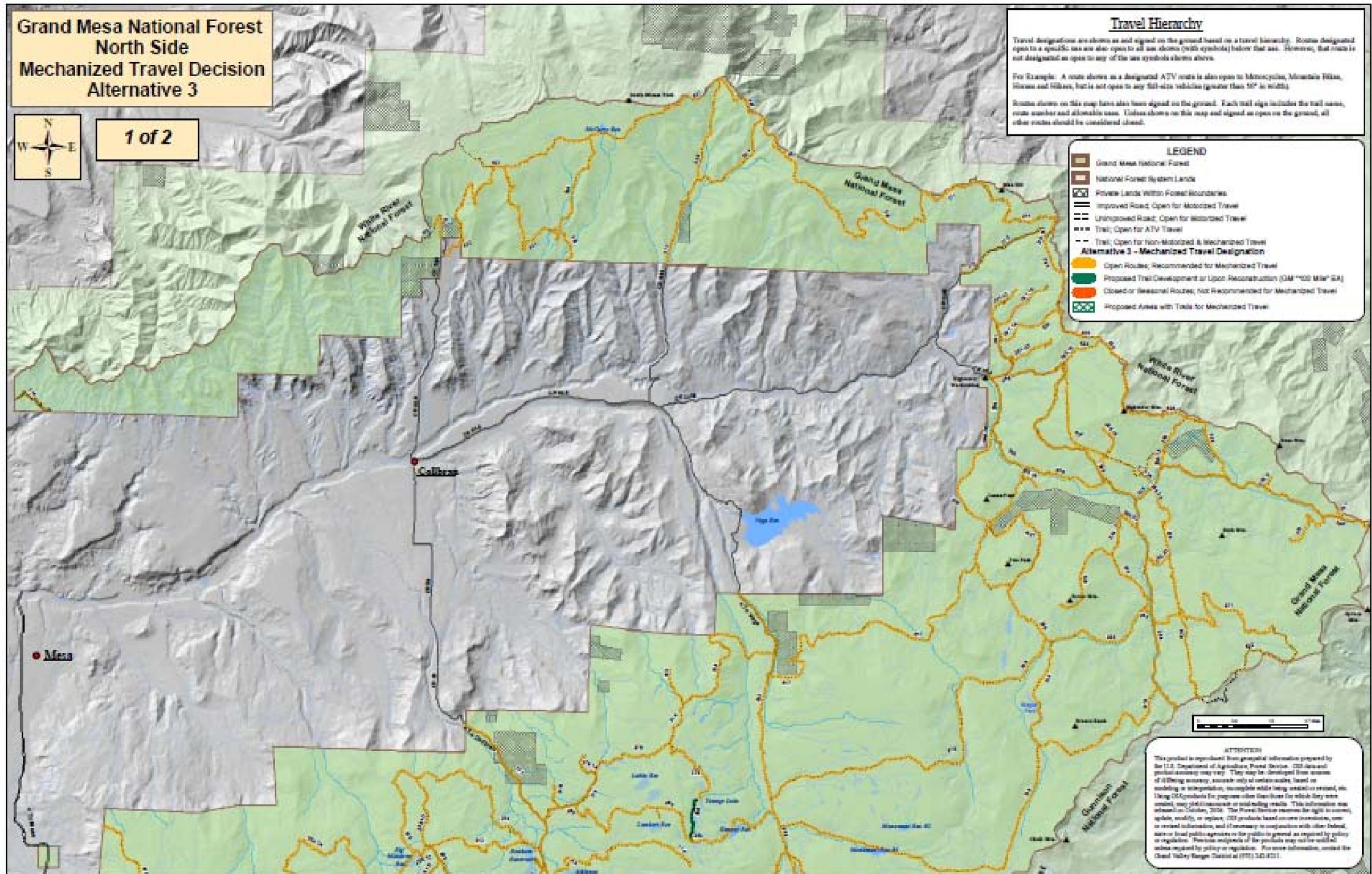


Figure 9. Alternative 3 Grand Mesa North.

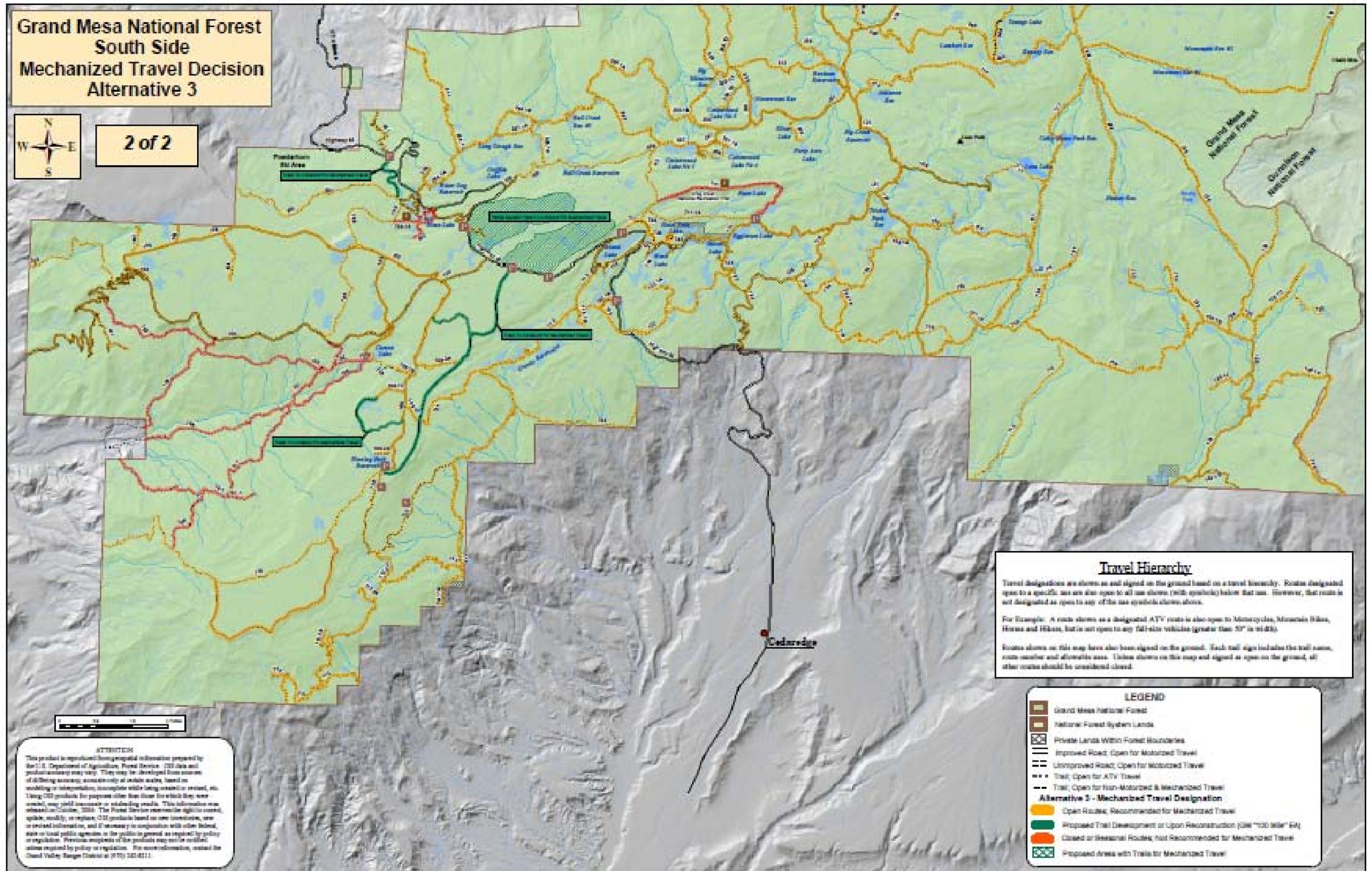


Figure 10. Alternative 3 Grand Mesa South.

2.1.6 Design Criteria for Alternatives

The Forest Service also developed the following design criteria to be used in conjunction with the alternatives.

Table 2.1.6. Design Criteria for Alternatives

Resource Element	Design Criteria	Applicable to			
		No Action	Alternative 1	Alternative 2	Alternative 3
Education & Information	Direct educational and volunteer resources at mechanized users in an attempt to eliminate undesirable contacts with other users in the Kannah Creek drainage	Yes	Yes	Yes	No
	Mount an educational campaign directed toward the user groups responsible for creating unauthorized trails.	No	Yes	Yes	Yes
	Encourage mountain bike and other user groups to get involved in the public land management process.	Yes	Yes	Yes	Yes
	Encourage mountain bike user groups to self-police to prevent unauthorized trails and volunteer to rehabilitate unauthorized trails in the Lands End and "Old Powderhorn" areas.	No	Yes	Yes	Yes
Cooperation	Encourage a partnership of local residents, the COPMOBA organization/other local mountain bike organizations and the Grand Valley Ranger District to rehabilitate damaged areas and then monitor these areas for unauthorized uses.	No	Yes	Yes	Yes
Monitoring	Monitor reported incidents occurring between different user groups to ensure problems are not escalating.	Yes	Yes	Yes	Yes

Resource Element	Design Criteria	Applicable to			
		No Action	Alternative 1	Alternative 2	Alternative 3
Trail Design	Route new trails to avoid wetland areas in accordance with Watershed Conservation Practices Handbook.	Yes	Yes	Yes	Yes

2.2 Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate a reasonable range of alternatives and to briefly discuss the reasons for eliminating those alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided input for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of restricting non-motorized, mechanized use to designated routes on the Grand Mesa National Forest to prevent further resource damage from a proliferation of user-created routes; duplicative of the alternatives considered in detail; or determined to be components that would cause unnecessary environmental harm. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

2.2.1 No Initial Mechanized Travel Restrictions

An alternative was suggested that no initial mechanized travel restrictions be implemented. It was felt this restriction should be a last-resort after education efforts and a partnership of user groups rehabilitating damaged areas proved ineffective.

This alternative is not considered in detail because there currently are no groups coming to the Forest Service proposing to spend the time and/or money to rehabilitate areas that have been damaged by other users. User-created routes would continue to proliferate while rehabilitation was occurring. This alternative does not reflect policy, direction or compatibility with other Travel Management decisions on the GMUG. Additionally, this suggested alternative does not reflect LRMP standards and guidelines or address resource and economic viability for implementation.

2.2.2 Restrict Mechanized Travel below the Rim of Grand Mesa

An alternative was suggested that would restrict mechanized use to designated routes in areas below the rim of the Grand Mesa to prevent user created trails and their negative impacts. Opportunities for gravity powered mountain bike use to create undesirable trails would be eliminated. Decommissioning of all existing and future “non-system” routes below the rim of the Grand Mesa would occur.

This alternative is not considered in detail because all action alternatives already consider the effects of travel on designated routes only below the rim of Grand Mesa. Additionally, this suggested alternative implies that impacts from off-route mechanized travel are only being

realized “below the rim” which is not accurate. Implementation of this alternative would be confusing and extremely difficult for the Forest Service to enforce.

2.2.3 Open Link Connecting Cobbett Lake and Crag Crest Trail West Parking Lot to Mechanized Travel

An alternative was suggested that would open a link between Cobbett Lake and the west parking lot for the Crag Crest Trail to mechanized travel.

This alternative is not considered in detail at this time as the trail link above is associated with hiker-only trail systems (including Crag Crest). Encouraging additional uses of this trail system would also require the additional analysis and decisions which are outside the scope of this effort.

2.2.4 Open “Extra Credit” Trail to Mechanized Travel

An alternative was suggested that would include opening a trail known by some local users as “Extra Credit” to mechanized travel which was part of original reclaimed highway alignment.

This alternative is not considered in detail at this time as the trail above is has very steep banks that drop directly on to state highway creating a very hazardous condition to both highway and trail users. Encouraging use of this trail system would require additional analysis and total re-alignment to mitigate safety hazard.

2.3 Comparison of Alternatives _____

This section provides a summary of the effects of implementing each alternative considered in detail. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 2.3 Comparison of Alternatives.

Resource	No Action	Alternative 1 (Proposed Action)	Alternative 2 (Additional Routes)	Alternative 3 (Additional Routes w/ Restrictions)
Air Quality				
	Slight increases in traffic on existing roads may occur as trends in recreation use change over the years yielding slight increases in fugitive dust & exhaust emissions.	Same as No Action.	Same as No Action.	Same as No Action.
Soils, Watershed & Vegetation				
	<p><u>Gentle slopes</u> limit erosion potential. Vegetation may be damaged directly from mechanized travel.</p> <p><u>Steep slopes</u> where there is limited ground cover may be susceptible to erosion and compaction from continued cross-country mechanized travel. Vegetation may be damaged directly from mechanized travel.</p> <p><u>Dense vegetation</u> particularly woody vegetation is less desirable for cross-country mechanized travel and its presence minimizes compaction potential.</p> <p><u>Wetlands and Fens</u></p> <ul style="list-style-type: none"> • Sedimentation in <u>waterbodies</u> may occur 	<p><u>Soils Affected by Proposed Trails</u>-Not applicable.</p> <p><u>Waterbodies</u>-No effect.</p> <p><u>Wetlands and Fens</u>-No effect.</p>	<p><u>Soils Affected by Proposed Trails</u>-Removal of vegetation and exposure of soil further subject it to erosion and compaction. Proper trail design would minimize damage.</p> <p><u>Waterbodies</u>- No effect.</p> <p><u>Wetlands and Fens</u>-Future development of mechanized trails would remove minimal vegetation and expose soil adjacent to these areas. Proper trail design would further minimize soil erosion and vegetation damage.</p>	Same as Alternative 2.

Resource	No Action	Alternative 1 (Proposed Action)	Alternative 2 (Additional Routes)	Alternative 3 (Additional Routes w/ Restrictions)
	<p>from continued cross-country mechanized travel directly or indirectly from travel paths adjacent to waterbodies. Aquatic/ riparian vegetation may be damaged directly from mechanized travel.</p> <ul style="list-style-type: none"> • Sedimentation may occur from continued cross-country mechanized travel from travel paths in/adjacent to wetlands. Aquatic/ riparian vegetation may be damaged directly from mechanized travel. 			
Threatened and Endangered Species				
Canada lynx	No Effect	Same as No Action	May Affect, Not Likely to Adversely Effect	May Affect, Not Likely to Adversely Effect
Greenback cutthroat trout	Unrestricted mechanized travel may have negative effects to cutthroat trout habitat on stream crossings.	No effect	Same as Alt 1	Same as Alt 1
Sensitive Species				
No Impacts to these species	<ul style="list-style-type: none"> • American marten • Pygmy shrew • American wolverine • Fringed myotis • Townsend’s big- 	<ul style="list-style-type: none"> • American marten • Pygmy shrew • American wolverine 	<ul style="list-style-type: none"> • American marten • Pygmy shrew • American wolverine 	Same as Alternative 2

Resource	No Action	Alternative 1 (Proposed Action)	Alternative 2 (Additional Routes)	Alternative 3 (Additional Routes w/ Restrictions)
	<ul style="list-style-type: none"> • eared bat • American three-toed woodpecker • Bald eagle • Boreal owl • Flammulated owl • Lewis' woodpecker • Northern goshawk • Olive-sided flycatcher • Purple martin 	<ul style="list-style-type: none"> • Fringed myotis, Townsend's big-eared bat • American three-toed woodpecker • Bald eagle • Boreal owl • Brewer's sparrow • Flammulated owl • Lewis' woodpecker • Northern goshawk • Northern harrier • Olive-sided flycatcher • Purple martin • Boreal toad • Northern leopard frog • Bluehead sucker • Mountain sucker • Colorado River Cutthroat trout 	<ul style="list-style-type: none"> • Fringed myotis • Townsend's big-eared bat • American three-toed woodpecker • Bald eagle • Boreal owl • Brewer's sparrow • Lewis' woodpecker 	
<p>May Adversely Impact Individuals of these species</p>	<ul style="list-style-type: none"> • Brewer's sparrow • Northern harrier • Boreal toad • Northern leopard frog, • Bluehead sucker 	<p>None</p>	<ul style="list-style-type: none"> • Flammulated owl • Northern goshawk • Northern harrier • Olive-sided 	<p>Same as Alternative 2</p>

Resource	No Action	Alternative 1 (Proposed Action)	Alternative 2 (Additional Routes)	Alternative 3 (Additional Routes w/ Restrictions)
	<ul style="list-style-type: none"> • Mountain sucker • Colorado River Cutthroat trout 		flycatcher <ul style="list-style-type: none"> • Purple martin • Boreal toad • Northern leopard frog • Bluehead sucker • Mountain sucker • Colorado River Cutthroat trout 	
Management Indicator Species				
Merriam’s wild turkey	No change in habitat or population trends	Same as No Action	Same as No Action	Same as No Action
Brewer’s sparrow	Effects of mountain biking are relatively unknown. Existing situation of no restrictions to mountain biking has more potential for impacts to Brewer’s sparrow than any of the action alternatives.	No change in habitat or population trends	Same as Alternative 1	Same as Alternative 1
Red-naped sapsucker	No change in habitat or population trends	No change in habitat or population trends	Very small change in habitat , no change in population trends	Very small change in habitat, no change in population trends
Rocky Mountain elk	No change in habitat or population trends	No change in habitat or population trends	Very small change in habitat , no change in population trends	Very small change in habitat, no change in population trends
Northern goshawk	No change in habitat or population trends	No change in habitat or population trends	Very small change in habitat , no change in population trends	Very small change in habitat no change in population trends
American marten	No change in habitat or population trends	No change in habitat or population trends	No change in habitat or population trends	No change in habitat or population trends

Resource	No Action	Alternative 1 (Proposed Action)	Alternative 2 (Additional Routes)	Alternative 3 (Additional Routes w/ Restrictions)
Colorado River cutthroat trout	Habitat effects; no change in population trends	No change in habitat or population trends	Very small change in habitat , no change in population trends	Very small change in habitat, no change in population trends
Brown trout	Habitat effects; no change in population trends	No change in habitat or population trends	Very small change in habitat, no change in population trends	Very small change in habitat, no change in population trends
Rainbow trout	Habitat effects; no change in population trends	No change in habitat or population trends	Very small change in habitat , no change in population trends	Very small change in habitat, no change in population trends
Brook trout	Habitat effects; no change in population trends	No change in habitat or population trends	Very small change in habitat , no change in population trends	Very small change in habitat no change in population trends
Recreation				
	Does not meet policy direction regarding travel in Chapter 1. Is inconsistent with pending Gunnison and existing Uncompahgre National Forest Travel Management Plans.	Meets policy, direction and is consistent with other plans. Does not fully address user demand for mechanized use.	Meets policy, direction and is consistent with other plans. Address user demand for mechanized use with new routes.	Meets policy, direction and is consistent with other plans. Addresses user demand for mechanized use with new routes. Implements a seasonal restriction which maintains backcountry management emphasis of equestrian use in Kannah Creek Basin.
Transportation System & Safety				
	Shortages in funding for maintenance of trails. All other transportation elements would remain the same.	Same as No Action.	Due to the increase in numbers and miles of mechanized trails there would be continued shortages in funding for	Similar to Alternative 2 except for an additional seasonal safety/ management restriction in the Kannah Creek

Resource	No Action	Alternative 1 (Proposed Action)	Alternative 2 (Additional Routes)	Alternative 3 (Additional Routes w/ Restrictions)
			construction and maintenance of trails. However, there is also the opportunity for more partnerships with user groups. All other transportation elements would remain the same.	Basin.
Heritage Resources				
	Inadvertent negative impacts.	No effect	Same as Alternative 1	Same as Alternative 1
Other Forest Management Activities				
Range & Special Uses	No effect	Same as No Action	Same as No Action	Same as No Action

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CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

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

3.0 Existing Activities in Analysis Area _____

The environmental baseline includes a summary of past and present impacts of federal, state, and private actions and other human activities in the analysis area.

3.0.1 Water Development

Domestic and agricultural water developments have been extensive across the Grand Mesa National Forest. Construction of reservoirs, ditches, and domestic water sources has resulted in regulation of most free-flowing waters and naturally impounded waters on the Grand Mesa. Current water policies do not support strategies to protect and maintain flows. At least fourteen fens on the Grand Mesa have been impacted by flooding (Austin 2008). Surface water diversions for agriculture and municipal use are expected to continue and increase.

3.0.2 Livestock Grazing

Livestock grazing has been a common practice on the lands of western Colorado for many decades. Historic over-grazing has been reported as a factor in the decline or loss of riparian areas, as well as modifying some forest understory habitats, particularly aspen forests. Changes in grazing management were initiated as part of allotment management plan revisions in the 1980s. These revisions have aided in the reduction of grazing impacts to wetlands and riparian areas and resulted in greater stability for these habitats.

3.0.3 Fire Management

Prescribed fire activities and hazardous fuels reductions have been concentrated in the shrubland and oakbrush communities on south-facing slopes of the Battlement Mesa, north of Collbran, Colorado, as well as in the Kannah Creek watershed on the western slopes of the Grand Mesa. The objective of reestablishing fire intervals in these plant communities is to reduce natural fuel buildup and improve browse for big game species. The frequency of wildfires on GMUG may increase as vegetation communities continue to develop and fuels consequently increase. The potential impacts of wildfires may be severe to sensitive species, affecting individuals directly and indirectly by destroying occupied habitats. A fire use amendment to the Forest Plan has recently changed fire suppression efforts to be determined on a case-by-case basis for naturally started fires.

3.0.4 Timber Management

Past timber harvests of Engelmann spruce, subalpine fir, and aspen have occurred across the Grand Mesa. Historic timber management practices have had varying impacts to sensitive

species, ranging from directly removing suitable habitats to providing regenerated habitat types.

Aspen has recently been experiencing decline due to insects and disease on Grand Mesa. Beetle kill in conifers is also prevalent in Colorado. These events may lead to increased timber harvest in these forest types on the Grand Mesa.

3.0.5 Recreation

Historic recreational opportunities within the project area include fishing, hunting, and firewood gathering. Light dispersed camping occurs during the summer months with heavy dispersed camping occurring during the fall big game hunting seasons. In the last few decades motorized winter and summer recreation activities have become common. Mountain biking is a relatively new activity. Most mechanized use has been primarily been occurring on existing system routes.

3.0.6 Oil and Gas Development

The Grand Mesa has 5 active gas wells and NEPA-approved gas development which may result in an additional 20 well pads containing up to 50 wells. There is no immediate plan to drill these additional wells.

3.1 Air Quality

3.1.1 Affected Environment

A more detailed report regarding air quality may be found in the project file. Air quality in the analysis area is affected by activities currently conducted within the area. The analysis area for direct, indirect, and cumulative effects is defined here as the Grand Mesa National Forest with approximately a 40-mile radius buffer which includes both Class I and Class II airsheds.

In the vicinity of the analysis area, the primary sources of air pollution include: gravel pits, gas and coal-fired electrical power generating plants, various sources associated with oil and gas production, crematoriums, landfills, gravel crushers/processing equipment, asphalt plants, smoke from grass and forest fires, fugitive dust from roadways/natural wind-blown dust and vehicle emissions. The primary pollutants of concern associated with these existing sources are oxides of nitrogen (NO_x), carbon dioxide (CO), sulfur dioxide (SO₂), and particulate matter with an aerodynamic diameter less than 10 microns (PM₁₀) and with an aerodynamic diameter less than 2.5 microns (PM_{2.5}). The combustion of fossil fuels is the primary source of NO_x, CO and SO₂ emissions. Vehicle traffic and wind erosion contribute to PM₁₀ emissions.

The analysis area is designated a Class II area, as defined by the Federal Prevention of Significant Deterioration (PSD) provision of the Clean Air Act. The PSD Class II designation allows for moderate growth or degradation of air quality within certain limits above baseline air quality. The standards for significant deterioration are more stringent for Class I areas than for Class II. Federal Mandatory Class I Areas located near analysis area include West Elk Wilderness, Black Canyon of the Gunnison National Park and Maroon Bells-Snowmass Wilderness Area. However, no activities related to motorized travel would occur in these

areas. Due to the nature of the project (i.e., public vehicle travel on designated routes), no specific permit requirements apply to gaseous emissions.

Fugitive Dust associated with accessing trail opportunities

Emissions associated with vehicle traffic would include fugitive particulate emissions as a result of travel on unpaved roads. Fugitive dust particles are generally large enough that long-range transport of these emissions does not occur. Fugitive dust generated from road and trail use is expected to be short-term and localized.

While occasional fugitive dust occurs from mechanized travel, EPA has not established criterion to allow estimation of any meaningful effect and will therefore not be analyzed.

Vehicle Exhaust associated with accessing trail opportunities

Nitrogen oxides form when fuel burns at high temperatures, such as in motor vehicle engines. Emissions associated with vehicle traffic would include NO_x and CO emissions from vehicle tailpipes.

Carbon monoxide (CO) is a product of motor vehicle exhaust. High concentrations of CO generally occur in areas with heavy traffic congestion such as cities (USEPA, 1999). Locally, the analysis area has a background concentration of 6.41-27.13 tons/year/square mile (USEPA, 1999). Nationally, CO concentrations have consistently declined over the last 30 years. Therefore, CO emissions will not be further addressed as the declining trend is expected to continue.

Climate Change associated with accessing trail opportunities

Approximately 14% of U.S. NO_x emissions (a contributor to climate change) come from vehicle traffic (EIA, Nov 2007). NO_x has approximately 310 times the global warming potential of carbon dioxide equivalency. However the percentage of NO_x emitted is very low compared to other green house gases and even considering the greater global warming potential vehicle emissions (NO_x) count for less than 1% of total U.S. global warming potential. See Cumulative Effects section for discussion.

3.1.2 Environmental Effects All Alternatives

Fugitive Dust associated with accessing trail opportunities

Fugitive dust emissions from vehicles on unpaved roads are calculated from a formula based on AP 42, Fifth Edition, Volume I, Chapter 1 Section 13.2.2 with assumptions provided in project file.

The expected fugitive PM_{2.5} and PM₁₀ emission factors respectively would be 0.1725 lbs/VMT and 0.01681 lbs/VMT. These emissions would occur throughout the project area. Any dust generated by vehicles at a given location would be localized and short-term. Fugitive dust emissions would also occur from wind-blown erosion, however, because of the large expanses of forested and vegetated areas on the public lands, wind-blown dust is considered to be negligible.

Vehicle traffic and associated emissions would increase slightly as a result of the increased future demand and use of roads for all alternatives.

Vehicle Exhaust associated with accessing trail opportunities

Vehicle exhaust emissions were estimated for NO_x. Vehicle miles traveled would be greatest during the 3-4 month long use season (primarily summer through fall); therefore, vehicle miles traveled will be estimated for use for the purposes of comparison only. Actual vehicle miles traveled will be much lower the rest of the year.

Calculation of the emissions using an EPA methodology results in an estimated 2.64 lbs. of NO_x produced per day, or about 0.001 tons per day. These emissions would be distributed over the project area. These emissions estimates represent highest expected road use days and are not considered substantial enough to warrant concern.

Exhaust emissions from vehicles would be short term and localized. These emissions are not regulated.

Vehicle traffic and associated emissions would increase slightly as a result of the increased future demand and use on the transportation system under any of the alternatives. None of the alternatives are expected to cause or contribute to violations of State or Federal air quality standards, and would not result in adverse effects on ambient air quality within the project area.

Table 3.1.2. Summary of Air Quality Effects

Air Quality Element	All Alternatives
Fugitive Dust	<p>Slight increases in traffic on existing roads may occur as trends in recreation use change over the years yielding slight increases in fugitive dust emissions.</p> <p>0.069 tons of PM_{2.5} and 0.007 tons of PM₁₀ emissions per day were estimated to occur on the designated unpaved motorized routes. These emissions are not considered significant.</p>
Exhaust	<p>Slight increases in traffic on existing roads may occur as trends in recreation use change over the years yielding slight increases in vehicle exhaust emissions.</p> <p>0.001 tons of NO_x emissions per day were estimated to occur.</p>

3.1.3 Cumulative Effects

Vehicle traffic and associated emissions in the analysis area would increase slightly as the demand for recreation or other uses on the Grand Mesa National Forest increases under any of the alternatives. However, these increases are not considered significant. These increases are not expected to cause or contribute to violations of State or Federal air quality standards, and would not likely result in adverse effects on ambient air quality within the project area.

While any of the alternatives including the no action alternative for this analysis would incrementally contribute to climate change whenever motorized traffic levels increase, the extent of the change is directly attributable to current and future demand for activities on the Grand Mesa National Forest. These changes are not discernable between alternatives or even

on a national scale due to the limited size of the analysis area and the unknown vehicle miles traveled by the general public. There would be no climate change effects from fugitive dust.

3.2 Soils, Watershed & Vegetation

3.2.1 Affected Environment

The analysis area (Grand Mesa National Forest) contains widely varying terrain with gentle to steep, wooded slopes of Engelmann spruce, sub-alpine fir, and aspen, along with relatively flat, boulder-strewn grassy meadow areas and year-round and seasonal reservoirs and ponds. The lower elevations include oakbrush, pinyon-juniper, sagebrush and adobe badlands habitats.

Approximately 1% of the Fruita Division and 1.3% of Grand Mesa portion of the analysis area is surface water (predominantly reservoirs and streams). Approximately 7% of the Fruita Division is unmapped for soils and vegetation. Additionally, about 4.3% of the Grand Mesa is a combination of wet/saturated soils which may support wetlands or fens.

Areas currently used for cross-country mechanized travel include steep slopes with minimal vegetation (such as along the flanks of the Grand Mesa), old roads/skid trails, gently sloped areas with minimal woody vegetation (such as meadows), areas cleared for winter travel, current trail/road alignments, etc.

Soils and vegetation present within the analysis area are summarized in Table 1 of the specialist report in the project file.

3.2.2 Environmental Effects No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No new routes would be constructed; however effects would continue to occur from unrestricted travel. See below for a summary of effects. More details are available in Table 1 of the specialist report in the project file. Effects to soils and vegetation are primarily related to slope and vegetation density.

Gentle Slopes

Gentle slopes limit erosion potential. Vegetation may be damaged directly from mechanized travel.

Steep Slopes

Steep slopes where there is limited ground cover may be susceptible to erosion and compaction from continued cross-country mechanized travel. Vegetation may be damaged directly from mechanized travel. Steep slopes without vegetation may be susceptible to erosion and compaction from continued cross-country mechanized travel.

Dense Upland Vegetation

Dense vegetation particularly woody vegetation is less desirable for cross-country mechanized travel and its presence minimizes compaction potential.

Waterbodies

Sedimentation may occur from continued cross-country mechanized travel directly in waterbodies or indirectly from travel paths adjacent to waterbodies. Aquatic/riparian vegetation may be damaged directly from mechanized travel. As budget allows, existing routes would be relocated out of wet areas for sustainability reasons.

Wetlands and Fens

Mechanized travel is expected to be minimal in wetlands and fens due to the wet boggy nature and thick vegetation making travel difficult.

Sedimentation may occur from continued cross-country travel from travel paths in/adjacent to wetlands. Aquatic/riparian vegetation may be damaged directly from mechanized travel.

3.2.2 Environmental Effects All Action Alternatives

Under any of the action alternatives mechanized travel would be restricted to designated routes. Under the Proposed Action these are all existing routes. Under Alternatives 2 and 3 there would be up to 7 miles of new non-motorized trail construction and approximately 21 miles of trail designation in formerly disturbed areas which may require clearing or maintenance resulting in a total of less than 6.5 acres of disturbance within the analysis area in addition to the existing routes in the proposed Action. See below for a summary of effects by soil type (Table 3.2.2). For a more detailed description of effects by soil/vegetation type see Table 1 of the specialist report in the project file. Effects of all aspects for Alternatives 2 and 3 summarized below would be negligible because new trails (both to be constructed and designated from existing disturbance) are found on low-angle slopes which are more resistant to erosion.

Soils/Vegetation Affected by Proposed Trails

Alternative 1 would have no new effect on soils/vegetation as travel would be restricted to existing roads and trails. Alternatives 2 and 3 would result in designation and future development of mechanized trails which would remove vegetation and expose soil further subjecting it to erosion and compaction. Proper trail design would minimize soil and vegetation damage. Due to the very small acreage of new disturbance planned there would be negligible effects to both soil and vegetation. Acreages of disturbance are more applicable to individual wildlife species habitat (not particular soils) and are further addressed in terms of impacts later in Chapter 3 of this document. Soil types affected are summarized in Table 3.2.2 below.

Table 3.2.2 Summary of Effects by Soil Types Affected by Proposed Trails

Soil or Rock Type	Associated Vegetation	Effects from Action Alternatives
Afley, warm Rock outcrop association	Hairgrass/ bluegrass	Alternative 1 would have no effect on these soils/ vegetation. Alternatives 2 & 3 would result in designation & future development of mechanized trails which would remove vegetation and expose soil. Proper trail design would minimize soil and vegetation damage.
Booneville, Needleton family-Doughspon complex	Mixed conifer	Alternative 1 would have no effect on these soils/ vegetation. Alternatives 2 & 3 would result in designation & future development of mechanized trails which would remove vegetation and expose soil. Proper trail design would minimize soil and vegetation damage.
Cryaquolls and Borohemists	Fen-associated vegetation	Alternative 1 would have no effect on these soils/ vegetation. Alternatives 2 & 3 would result in designation & future development of mechanized trails which would remove vegetation and expose soil adjacent to these areas. Proper trail design (including rerouting around wet areas) would minimize soil erosion and vegetation damage adjacent to wetlands.
Cryoboralfs, Cryocrepts, and Rubble land	Minimal	Alternative 1 would have no effect on these soils/ vegetation. Alternatives 2 & 3 would result in designation & future development of mechanized trails which would remove vegetation and expose soil. Proper trail design would minimize soil and vegetation damage.
Grand Mesa-Elkwallow-Doughspon Complex	Engelmann spruce/ subalpine fir, aspen where well drained.	Alternative 1 would have no effect on these soils/ vegetation. Alternatives 2 & 3 would result in designation & future development of mechanized trails which would remove vegetation and expose soil. Proper trail design would minimize soil and vegetation damage.
Irson-Namela-Doughspon, well drained complex, extremely stony	Aspen, serviceberry, snowberry.	Alternative 1 would have no effect on these soils/ vegetation. Alternatives 2 & 3 would result in designation & future development of mechanized trails which would remove vegetation and expose soil. Proper trail design would minimize soil and vegetation damage.
Needleton-Scout families complex	Subalpine fir/ Engelmann's spruce, Douglas-fir, widely spaced aspen.	Alternative 1 would have no effect on these soils/ vegetation. Alternatives 2 & 3 would result in designation & future development of mechanized trails which would remove vegetation and expose soil. Proper trail design would minimize soil and vegetation damage.

Waterbodies

No new trails are proposed in this soil/vegetation type under any of the action alternatives, therefore there would be no effect.

Wetlands and Fens

Alternative 1 would have no effect on wetland and fen soils/vegetation. Alternatives 2 & 3 would result in designation and future development of mechanized trails which would remove vegetation and expose soil adjacent to these areas. Proper trail design which includes routing new trails to avoid wet areas would minimize soil erosion and vegetation damage adjacent to fens and wetlands. Due to the very small acreage of new disturbance planned near these features there would be negligible effects to water quality in these areas.

3.2.3 Cumulative Effects

All new management activities are analyzed as they are proposed; however, existing disturbances on a landscape scale are often hard to quantify especially where activities occur in unidentified places (such as unrestricted cross-country travel) and the baseline data reflects long-term management activities (range, water developments, timber harvest) that have previously impacted the soil/water/vegetation resources. Activities associated with water development, livestock grazing, fire, timber harvest and unrestricted cross-country travel would continue to cause soil and vegetation disturbance resulting in altered productivity, vegetation type conversions, soil compaction/erosion and sedimentation of waterways.

3.3 Threatened & Endangered Species _____

Under the Endangered Species Act, a Biological Assessment (BA) must be prepared for federal actions that are “major construction activities” to evaluate the potential effects of the proposal on listed or proposed species. The contents of the BA are at the discretion of the federal agency, and would depend on the nature of the federal action (50 CFR 402.12(f)). This summary discloses the potential effects of the Grand Mesa Mechanized travel proposed action and alternatives on aquatic and terrestrial Forest Service federally listed threatened or endangered species. A copy of the BA is in the project file.

3.3.1 General Affected Environment

The affected area for threatened and endangered species is the entire Grand Mesa National Forest. The analysis area contains widely varying terrain with gentle to steep, wooded slopes of Engelmann spruce, sub-alpine fir, and aspen, along with relatively flat, boulder-strewn grassy meadow areas and year-round and seasonal reservoirs and ponds. The lower elevations include oakbrush, pinyon-juniper, sagebrush and adobe badlands habitats. The following table summarizes listed species and their relationship to the project area:

Table 3.3.1 Federally Listed Species for the GMUG National Forest

Status	Common Name	Scientific Name	Suitable Habitat Affected or Species Present Within the Project Area?
Birds			
Threatened	Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	No
Mammals			
Threatened	Canada Lynx	<i>Lynx canadensis</i>	Yes
Fish			
Endangered	Bonytail Chub	<i>Gila elegans</i>	No*
Endangered	Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	No*
Endangered	Humpback Chub	<i>Gila cypha</i>	No*
Endangered	Razorback Sucker	<i>Xyrauchen texanus</i>	No*
Threatened	Greenback Cutthroat trout	<i>Oncorhynchus clarki stomias</i>	Yes
Insects			
Endangered	Uncompahgre Butterfly	Fritillary <i>Boloria acrocne</i>	No
Plants			
Threatened	Uinta Basin Cactus	Hookless <i>Sclerocactus glaucus</i>	No

* Water depletions may affect these species

Based upon the project area location and habitats affected, the potential effects of the proposed action to federally listed species are limited to the Canada lynx and Greenback cutthroat trout. There would be no effect to any other listed species or habitat, and they would not be further evaluated.

3.3.2 Affected Environment Canada Lynx

In the Southern Rocky Mountain Geographic Area lynx habitat is likely found in the subalpine and upper montane forest zones between 8,000 and 12,000 feet in elevation. Subalpine forests are typically dominated by subalpine fir and Engelmann spruce. Within the upper montane forest, spruce-fir forests transition to lodgepole pine, aspen, or mixed stands of pine, aspen and spruce. Engelmann spruce remains dominant on cooler, more mesic mid elevation sites, intermixed with aspen, lodgepole pine, and Douglas-fir. Lynx habitat in the

Southern Rockies is naturally fragmented, a function of elevation, aspect, and moisture regimes.

Mature and old growth successional stages of the above mentioned forest types are preferred denning habitats of lynx, especially where areas of large rock outcrops, large deadfall, or thickets are present. Primary prey for the lynx in North America is the snowshoe hare, especially during winter months. During the summer, grouse and small mammal species are also taken. Snowshoe hares are most abundant in early seral stage (approximately 20-40 years old) lodgepole pine and mature coniferous forests of lodgepole pine or spruce-fir supporting a dense tree or shrub understory (Koehler 1990).

Because of their structure, mature and late succession spruce-fir forests provide dense ground and snow level cover and forage necessary to support higher densities of snowshoe hare. Mature and late succession spruce-fir forests also provide excellent habitat for both the snowshoe hare and the red squirrel, an important alternate prey species of the lynx (U.S.D.A Forest Service et al. 1999). Mixed conifer-aspen forest, particularly those with dense regeneration or with an extensive shrub and woody debris understory, may be important for snowshoe hares and other prey species. Extensive stands of pure aspen may not provide quality hare habitat due to little winter habitat characteristics (ground and snow level cover). Also potentially important are high elevation sagebrush and mountain shrub communities found adjacent to or intermixed with forest communities, offering potential alternate prey species. Riparian and wetland shrub communities may support important prey as well.

Extensive stands of pure aspen may not provide quality hare (primary prey) habitat due to deficiencies in winter habitat characteristics. However, when mixed with spruce/fir, aspen (especially younger stands) they may substantially contribute to prey productivity (Ruediger et al. 2000). Lynx transplanted into Colorado were frequently located in well developed riparian and valley wetland shrub habitats of the upper montane and subalpine zones. These ecotones may provide quality foraging habitat for lynx.

Environmental Baseline

The Canada Lynx was listed as threatened in March 2000. In August 2004, the Second Edition of the Canada Lynx Conservation Assessment and Strategy (LCAS) was released, to provide a consistent and effective approach to conserve Canada lynx on federal lands. Following release of the LCAS, both Forests mapped lynx analysis units (LAUs) and habitat within them, based on Regional direction. Habitat was mapped based on existing vegetation information, including vegetation type, canopy closure and size of trees. The LCAS includes direction about limiting the amount of unsuitable habitat within a LAU (less than 30%), as well as maintaining at least 10% of the suitable habitat as denning habitat. There are 5 LAUs within the Analysis Area. All five meet the direction for suitable habitat; none have more than 30% unsuitable. Percent denning habitat is above 10% for all of the LAUs. Existing conditions of the LAUs are displayed in Table 3.3.2.

Table 3.3.2. LAU Existing Condition

LAU	Total LAU acres	Currently Suitable habitat	Currently unsuitable acres	Acres denning habitat	Percent denning habitat	Non-lynx habitat
Cottonwood Lakes	33,987	24,769	82	16,719	67%	9,136
Green Mountain	39,027	24,149	38	12,912	53%	14,840
Island Lake	25,642	16,782	100	10,205	60%	8,760
Kannah Creek	24,040	12,125	229	4,741	38%	11,686
South Mamm Peak	21,327	11,370	67	3,032	27%	9,890
Mesa Lakes	23,224	17,843	51	9,586	54%	5,330
Ruth Mountain	34,533	22,305	154	8,307	37%	12,074
The Flattops	43,133	28,444	4	18,830	66%	14,685

Lynx have been reintroduced to southwestern Colorado, beginning in 1999. Tracking of these lynx indicate that lynx are using or moving through both Forests, but only a few of the relocations lie within or adjacent to the project area (CDOW 2005).

The Recovery Outline (USDI FWS 2005a) identifies core areas, secondary areas and peripheral areas, based on historical and current occurrence records, as well as confirmed breeding. The Southern Rockies (Colorado and Wyoming) were identified as a Provisional Core Area. This designation was identified because this area contains a reintroduced population. Reproduction has been documented but it is too early to determine whether a self-sustaining population would result.

3.3.3 Environmental Effects Canada Lynx No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No new routes would be constructed; therefore, no direct or indirect effects to lynx or lynx habitat would occur from mechanized travel under this alternative.

ESA Determination: No effect.

3.3.4 Environmental Effects Canada Lynx Proposed Action

All existing activities as described in Section 3.0 would continue to occur. The proposed action would not construct any new routes; therefore, there are no discernable direct or indirect effects to lynx or lynx habitat. There would be no change from baseline conditions.

3.3.5 Environmental Effects Canada Lynx Alternatives 2 and 3

Alternatives 2 and 3 would create approximately 14 miles of new trail construction above the true environmental baseline of currently existing mountain bike trails/routes. Another 13 miles of Nordic ski trails would be designated for summer use.

Of the 14 miles of new trail construction, approximately 1 acre of winter foraging lynx habitat would be directly affected. Approximately 1 acre of “other foraging” lynx habitat would be directly affected.

Indirect effects to lynx may result from a potential increase in recreational use in some areas, once new routes are designated, such as in Nordic ski areas and the new Mesa Top loop. This may lead to displacement of individual lynx; however, the use would be during the summer, which is not a critical time period for lynx.

ESA Determination: May Affect, Not Likely to Adversely Effect.

Rationale: Mountain bike use during the summer is already occurring on the existing roads and trails, as well as cross-country. This use is currently not restricted in any travel management decision, but would be restricted to designated routes only with a decision for any of the action alternatives. Summer is not a critical time period for lynx, and some lynx make large scale movements during this time period. The slight changes in patterns of mountain biking use from this travel management decision would have a very small (discountable) effect to the Canada lynx or its habitat.

3.3.6 Cumulative Effects Canada Lynx

Natural gas development is occurring at a fast rate on private, BLM, and state lands surrounding the Battlement Mesa and Grand Mesa. Some of the development is also slated for the National Forest in the Green Mountain LAU and the Battlement Mesa linkage area. Gas development, including pipelines, well pads and roads are occurring in many areas in and adjacent to the Grand Mesa NF. Energy development may result in small temporary or permanent losses of lynx habitat and increased traffic mortality.

Water development from private water users is being planned on the National Forest, which may result in a small permanent loss of lynx habitat and temporary increase in traffic.

3.3.7 Affected Environment Greenback Cutthroat Trout

Greenback cutthroat trout were common in the late 19th century, ranging along the Front Range from Wyoming to New Mexico, the species began to decline when settlers arrived in the area. Mining in its native river basins led to sediment in and toxicity of the water. These factors, along with agricultural water diversions and over-fishing, led to the decline of many greenback cutthroat trout populations. Additionally, the introduction of non-native species was also detrimental to the greenback cutthroat. Other subspecies of cutthroat were introduced to greenback habitat, further damaging populations due to hybridization.

Environmental Baseline

Several small populations were discovered in cold, clear tributaries to the Arkansas River and South Platte River drainages between 1957 and 1970 making possible the 1978 listing of the subspecies as endangered under the 1973 Endangered Species Act. Recovery efforts for the

greenback cutthroat by the U.S. Fish and Wildlife Service are ongoing and seemed to have made it possible to upgrade its status to threatened. However, it was recently determined that due to limited study of the original stock most greenbacks in the Arkansas River and South Platte River drainages reintroduction program were actually the similar Colorado River Cutthroat Trout (Young 2002). Ironically, on the Western Slope of Colorado the opposite occurred. Through more advanced genetic testing, populations of what were thought to be pure strains of Colorado River cutthroat trout have been found to be pure or nearly pure strains of cutthroat have the Greenback (GB) lineage. While the genetics are still being sorted out by fisheries professionals, The Fish and Wildlife Service is considering cutthroat of the GB lineage that are at least 80% pure to be subject to requirements of the Endangered Species Act.

Habitat preferences for greenback cutthroats are assumed to be the same as for Colorado River cutthroat trout. A description of the habitat preferences can be found in the MIS section for Colorado River cutthroat trout or in the BE/BA in the project record.

Suitable habitat for Greenback cutthroat occurs throughout the project area. Populations of various purity have, to date, been identified in East and Middle Forks of Big Creek, Brush Creek, East and West Forks of Brush Creek, Buzzard Creek, Coon Creek, and Hawxhurst Creek. Additional populations may be identified as genetic testing continues in the area.

3.3.8 Environmental Effects Greenback Cutthroat Trout No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. Due to their restrictive habitat, greenback cutthroat trout have short home ranges; therefore, even a small impact to available habitat could have an effect on local populations (Heggenes et al. 1991). Unrestricted travel by mountain bikes is likely having negative effects to cutthroat trout habitat on stream crossings.

3.3.9 Environmental Effects Greenback Cutthroat All Action Alternatives

There are no new mechanized routes proposed within the water influence zone (concern being increased sedimentation) or crossing streams occupied by greenback cutthroat trout. The action alternatives would have no effect to the species or its habitat.

ESA Determination: There would be no effect to greenback cutthroat.

3.3.10 Cumulative Effects Greenback Cutthroat Trout

Numerous land use actions (e.g., oil and gas activity, recreational activity, livestock grazing, road building, housing development, etc.) on State and private lands surrounding the Grand Mesa National Forest are reasonably certain to occur over the next several years. Greenback cutthroat trout habitat could be directly affected through possible habitat degradation and loss, adding to the cumulative effects of potential trout habitat degradation occurring throughout the Forest.

3.4 Sensitive Species

This is a summary of the Biological Evaluation (BE) which analyzed and determined the likely effects of the alternatives on Region 2 Forest Service sensitive species (FSM 2670.31-2670.32). Forest Service policy requires that a review of programs and activities, through a biological evaluation (BE), be conducted to determine their potential effect on threatened and endangered species, species proposed for listing, and sensitive species (FSM 2670.3).

The following list includes sensitive species, or their habitats, that are located in the Analysis area, or which are located adjacent to lynx habitat and could potentially be affected. A pre-field review was conducted of available information to assemble occurrence records, describe habitat needs and ecological requirements. Sources of information included Forest Service records and files for each forest, which have used state heritage database programs, state wildlife agency data, and scientific literature to determine potential presence of sensitive species on each unit.

The entire list of sensitive species for the forest is shown in Table 3.4.

Table 3.4. Sensitive Species Potentially Occurring in the Grand Mesa National Forest

Species Common Name	Species Scientific Name	Status	Habitat Description	Habitat or Species Potentially Occurring within Analysis Area
MAMMALS				
Fringed myotis	<i>Myotis thysanodes</i>	Sensitive Species	Inhabits caves, mines, and buildings in low elevation conifer and oakbrush shrublands up to 7,500 feet. Forages over associated riparian habitat.	Habitat – Yes Species - Likely
American marten	<i>Martes americana</i>	MIS & Sensitive Species	Inhabits mature spruce/fir and mixed conifer forests.	Habitat – Yes Species - Yes
Pygmy shrew	<i>Sorex hoyi</i>	Sensitive Species	Moist boreal environments, forest generalist, all captures of this species in Colorado have occurred above 9,600 feet.	Habitat – Yes Species - Yes
River otter	<i>Lontra canadensis</i>	Sensitive Species	Riparian habitats that traverse a variety of other habitats, mainly large river systems.	Habitat – No Species - No

Species Common Name	Species Scientific Name	Status	Habitat Description	Habitat or Species Potentially Occurring within Analysis Area
Spotted bat	<i>Euderma maculatum</i>	Sensitive Species	Restricted to cliff or rock faces in arid canyons associated with waterways in ponderosa pine or Douglas fir at 6,000-8,000 feet.	Habitat – No Species - No
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Sensitive Species	Forages in semi-desert shrubland, pinyon-juniper woodlands and open montane forests. Roosts in caves, mines, buildings and crevices.	Habitat – Yes Species - Likely
Wolverine	<i>Gulo gulo</i>	Sensitive Species	Inhabits undisturbed high boreal forests and tundra near timberline.	Habitat – Yes Species - No
Rocky Mountain bighorn sheep	<i>Ovis canadensis canadensis</i>	Sensitive	Steep, high mountain terrain preferring habitat dominated by grass, low shrubs, rock cover and areas near open escape	Habitat- Yes Species- No
Desert bighorn	<i>Ovis canadensis nelsoni</i>	Sensitive	Deserts, canyons at lower elevations	Habitat-no Species-no
BIRDS				
American three toed woodpecker	<i>Picoides dorsalis</i>	Sensitive Species	Species is resident in mature and old growth stands of spruce/fir.	Habitat – Yes Species - Yes
American peregrine falcon	<i>Falco peregrinus anatum</i>	Sensitive Species	Species nests on high cliffs overlooking rivers/lakes and forages over forests and shrublands.	Habitat – Yes Species - No
Bald eagle	<i>Haliaeetus leucocephalus</i>	Sensitive Species	Nests along large lakes and rivers; winters in a variety of habitats	Habitat – Yes Species - No
Black swift	<i>Cypseloides niger</i>	Sensitive Species	Species nests on high cliffs near or behind large waterfalls and forages high above the Analysis over conifer forests.	Habitat – No Species - No

Species Common Name	Species Scientific Name	Status	Habitat Description	Habitat or Species Potentially Occurring within Analysis Area
Boreal owl	<i>Aegolius funereus</i>	Sensitive Species	Mature spruce/fir or spruce/fir-lodgepole forests.	Habitat - Yes Species - Yes
Brewer's sparrow	<i>Spizella breweri</i>	MIS and Sensitive Species	Inhabits sagebrush dominated shrubland; may also be found in alpine willow stands.	Habitat - yes Species - Yes
Columbian sharp-tailed grouse	<i>Tympanuchus phasianellus columbianus</i>	Sensitive Species	Inhabits sagebrush dominated shrublands, intermixed with grasslands and mountain shrublands.	Habitat - No Species - No
Flammulated owl	<i>Otus flammeolus</i>	Sensitive Species	Nests in cavities in aspen and aspen mixed with conifer habitat to 10,000 feet, foraging close to nest sites, may forage over shrublands.	Habitat – Yes Species – Yes
Gunnison Sage-grouse	<i>Centrocercus minimus</i>	Sensitive Species	Late-successional sagebrush	Habitat – Yes Species -No
Lewis' woodpecker	<i>Melanerpes lewis</i>	MIS & Sensitive Species	Inhabits lowland and foothill riparian areas and nests in decadent cottonwoods up to 8,000 feet.	Habitat – Yes Species - possible
Loggerhead shrike	<i>Lanius ludovicianus</i>	Sensitive Species	Species inhabits open country with available lookout perches, especially semi-desert shrublands.	Habitat – No Species - No
Northern goshawk	<i>Accipiter gentilis</i>	MIS & Sensitive Species	Mixed hardwoods and conifers in stands of mature timber above 7,500 feet.	Habitat – Yes Species - Yes
Northern harrier	<i>Circus cyaneus</i>	Sensitive Species	Nests and forages in dense portions of open montane grasslands and wet meadows.	Habitat – Yes Species - Yes
Olive-sided flycatcher	<i>Contopus cooperi</i>	Sensitive Species	This species breeds primarily in mature spruce/fir or Douglas fir forests.	Habitat – Yes Species - Yes

Species Common Name	Species Scientific Name	Status	Habitat Description	Habitat or Species Potentially Occurring within Analysis Area
Purple martin	<i>Progne subis</i>	Sensitive Species	Species forages in open grassy parks, shores of lakes, meadows and around ponds; prefers aspen habitat near open water or wet meadows. Nests in mature aspen stands.	Habitat – Yes Species - Yes
Sage sparrow	<i>Amphispiza belli</i>	Sensitive Species	Low-elevation sagebrush habitat in >30 ac. patches	Habitat – Yes Species - likely
AMPHIBIANS				
Boreal toad	<i>Bufo boreas boreas</i>	Sensitive Species	Subalpine forest habitats with marshes, wet meadows, streams, beaver ponds, and lakes.	Habitat – Yes Species - Yes
Northern leopard frog	<i>Rana pipiens</i>	Sensitive Species	Wet meadows, marshes, beaver ponds, and streams.	Habitat – Yes Species - Yes
FISHES				
Bluehead sucker	<i>Catostomus discobolus</i>	Sensitive Species	Colorado River Basin Drainage: Variety of habitat, headwater streams to large rivers.	Habitat – Yes Species – Yes
Mountain sucker	<i>Catostomus platyrhynchus</i>	Sensitive Species	Headwaters downstream to mid-elevation, low gradient, slow-moving water	Habitat-No Species-No
Colorado River cutthroat trout	<i>Oncorhynchus clarki pleuriticus</i>	MIS & Sensitive Species	Headwater streams and lakes.	Habitat – Yes Species - Yes
Flannelmouth sucker	<i>Catostomus latipinnis</i>	Sensitive Species	Deep slow flowing pools in large rivers	Habitat – No Species - No
Roundtail chub	<i>Gila robusta</i>	Sensitive Species	Colorado River Basin Drainage: Variety of habitat, usually in slow flowing water adjacent to fast moving water	Habitat – No Species - No
INSECTS				

Species Common Name	Species Scientific Name	Status	Habitat Description	Habitat or Species Potentially Occurring within Analysis Area
Great Basin silverspot	<i>Speyeria nokomis nokomis</i>	Sensitive Species	Inhabits wetlands fed by springs or seeps; host plant violets at 5,200-9,000 feet.	Habitat – Yes Species - No
Hudsonian emerald	<i>Somatochlora hudsonica</i>	Sensitive Species	Boggy ponds 7,600-10,600 feet.	Habitat - Yes Species - No
PLANTS				
Lesser panicled sedge	<i>Carex diandra</i>	Sensitive Species	Fens, calcareous meadows 6,100-8,600 feet.	Habitat – Yes Species - No
Lesser bladderwort	<i>Utricularia minor</i>	Sensitive species	Fens, wetlands	Habitat-Yes Species-Yes
Sphagnum moss	<i>Sphagnum angustifolium</i>	Sensitive species	Fens, wetlands	Habitat-Yes Species-Yes
Slender cottongrass	<i>Eriophorum gracile</i>	Sensitive	Fens, wet meadows and pond edges from 8,100-12,000 ft. Found on Grand Mesa.	Habitat- Yes Species- Yes
Rocky Mountain thistle	<i>Cirsium perplexans</i>	Sensitive Species	Found on barren gray shale slopes 4,500-7,000 feet. Rock, cliff, and canyon habitat.	Habitat – Yes Species -Yes
Harrington's beardtongue	<i>Penstemon harringtonii</i>	Sensitive Species	Found 6,800-9,200 feet in open sagebrush or, less commonly, pinyon-juniper habitat. Not documented in Mesa or Delta County.	Habitat – Yes Species - No
DeBeque phacelia	<i>Phacelia scopulina var submutica</i>	Sensitive Species	Found at low elevation 4,700-6,200 feet, on steep clay slopes in the Wasatch Formation.	Habitat – Yes Species - Yes
Sun-loving meadowrue	<i>Thalictrum heliophilum</i>	Sensitive Species	Sagebrush and pinyon juniper habitat in underdeveloped soils, light colored clays with shale fragments; 6,300-8,800 feet	Habitat – Yes Species - Yes

Species Common Name	Species Scientific Name	Status	Habitat Description	Habitat or Species Potentially Occurring within Analysis Area
Wetherill milkvetch	<i>Astragalus wetherillii</i>	Sensitive Species	Big sagebrush and pinyon juniper habitat. Steep slopes, canyon benches, and talus below cliffs. On sandy clay soils derived from shale and sandstone 5,250-7,400 feet.	Habitat – Yes Species - No

All species in the above list with a “NO” in the Habitat column will not be considered further, and all alternatives would have “No impact” on these species. All wildlife species above with a “Yes” in the Habitat column will be evaluated for effects from the proposed action, unless species is known **NOT** to occur on the Grand/Battlement Mesa specifically. No plant species will be evaluated, as all designated routes are either existing roads or trails and the plants would not be impacted. New trails are not proposed in any sensitive plant habitats.

For more information on life histories and status of the above sensitive species, conservation assessments are available at: <http://www.fs.fed.us/r2/projects/scp/assessments/index.shtml>.

3.4.1 Affected Environment American marten

Considered secure in Colorado, marten occur throughout Alaska, Canada and the lower 48 states except for the Midwest and the South. In Colorado, they occur in most areas of coniferous forest habitat in the high mountains (Fitzgerald et al. 1994). Marten are considered common in subalpine forest, Douglas-fir, lodgepole pine and high elevation riparian habitats (Hoover and Wills 1984). Specifically, marten cover habitat occurs within mature and late-successional subalpine (spruce-fir) forest; Douglas-fir; lodgepole pine and high elevation riparian forests. They prefer late-successional or mixed-age stands with over 30%, and preferably 40-60%, canopy cover. The species prefers interior forest and will avoid open areas more than 100 to 250 meters wide. Marten remain active year-round and rely upon downed logs, woody debris, brush piles and rootwads to access the subnivean environment in search of food.

Marten are generally tolerant of human disturbance but are vulnerable to habitat loss or modification (NatureServe 2005, Ruggiero et. al 1994). Threats to marten include timber harvest that reduces canopy cover and removes structure from the forest floor, and trapping for pelts. Marten are susceptible to over-harvest (NatureServe 2005).

3.4.2 Environmental Effects American marten No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed; therefore there would be no loss of marten habitat.

3.4.3 Environmental Effects American marten Proposed Action Alternative

Under the Proposed Action there would be no additional routes constructed, and no loss of marten habitat.

Determination: There would be no impact to marten from this alternative.

3.4.4 Environmental Effects American marten Alternatives 2 and 3

There would be direct habitat removal effects on approximately ½ acre total within the newly constructed routes. There is a small possibility that marten could be displaced somewhat away from the new trails, if the recreational use is heavy. Marten are naturally curious, so this is not highly likely with occasional recreational use.

Determination: Given the very small possibility of displacing marten away from the trails on only 1 acre of marten habitat, alternatives 2 and 3 would have no impact on marten.

3.4.5 Cumulative Effects American marten

Marten habitat would continue to be impacted by current and future timber sale activity in their habitat on the Grand Mesa until species-desired canopy-cover is achieved. Spruce beetle mortality is also affecting marten habitat.

3.4.6 Affected Environment Pygmy shrew

Considered imperiled in Colorado, pygmy shrews are Colorado endemics with relatively unknown status, trend and distribution, other than documented occurrences in Grand, Gunnison and Larimer Counties (NatureServe 2005). Prior to 1961, this species was not known to occur south of Montana (Fitzgerald 1994). Pygmy shrew range in Alaska and Canada is extensive; pygmy shrew occurrence in Colorado is one of two disjunct populations in the lower 48 states (the other is the Appalachians) (NatureServe 2005).

Pygmy shrews use a variety of moist habitats, preferring grassy openings within a boreal forest matrix (NatureServe 2005). A specimen was collected in 1961 west of Fort Collins and another specimen was found near Rabbit Ears Pass. It is possible that this species occupies suitable habitat throughout the mountains of northern and central Colorado; however, populations may be discontinuous relicts from glacial times (Fitzgerald et al 1994). All captures of this species in Colorado have occurred above 9,600 feet which would coincide with many of the trails on top of the Grand Mesa. The species has been found in subalpine forests, clear-cut and selectively logged forests, forest-meadow edges, boggy meadows, willow thickets, aspen-fir forests, and subalpine parklands.

3.4.7 Environmental Effects Pygmy shrew No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed.

3.4.8 Environmental Effects Pygmy shrew Proposed Action Alternative

There would be no additional routes constructed, and no loss of pygmy shrew habitat. Therefore, there would be no impact to pygmy shrew from this alternative.

3.4.9 Environmental Effects Pygmy shrew Alternatives 2 and 3

There would be pygmy shrew habitat removal on approximately 1 acre total within the newly constructed routes.

Determination: Due to the very small loss of habitat, spread throughout 14 miles of new trail, there would be no impact to the pygmy shrew.

3.4.10 Cumulative Effects Pygmy shrew

As very little is known about this species, it can be assumed that any activities as described in Section 3.0 where vegetation is removed above 9600 feet in subalpine forests, logged forests, forest-meadow edges, boggy meadows, willow thickets, aspen-fir forests, or subalpine parklands may remove or alter some habitat components for this species.

3.4.11 Affected Environment North American wolverine

Considered critically imperiled in Colorado, the North American wolverine occurs over a large range in northern Canada and Alaska, where populations are in good condition. Wolverines have been extirpated from most of its historic range in the contiguous 48 states, with promising signs of semi-recovery in selected western states. Outside of Alaska, Montana has the largest population in the U.S. Numbers have apparently declined steadily in the U.S. beginning in the latter half of the 1800s (NatureServe 2005). In Colorado, records from the 19th century indicate that populations were never very high. Ruggiero et al. (1994) doubted that wolverines were ever common in Colorado and current population levels are not self-sustaining. Relatively recent CDOW surveys failed to find any definitive wolverine signs in the State (Fitzgerald et al. 1994).

Suitable habitat includes alpine and arctic tundra and boreal and mountain forests (primarily coniferous). Wolverines use habitats with snow on the ground in winter. Riparian areas may also be important winter habitat. Home range sizes in Alaska and Montana vary from 94 to 388 km² for females to 422 to 666 km² for males (Fitzgerald et al. 1994, Ruggiero et al. 1994).

When inactive, wolverines occupy dens in caves, rock crevices, under fallen trees, or in thickets. Young are born in March or April in natal dens among rocks or tree roots, in hollow logs, under fallen trees, or in dense vegetation, including sites under snow.

Over much of its distribution, the primary mortality factor for the wolverine is trapping (Ruggiero et al. 1994). Habitat has been degraded through timber harvesting, ski area construction, road construction, and general human disturbance (NatureServe 2005). Refugia, large areas that are not trapped and free from land-use impacts, can serve as sources of dispersing individuals and have been shown to be effective at ensuring the persistence of wolverine on the Analysis in Montana (Ruggiero et. el. 1994). Activities that increase the presence of early seral stages on the Analysis may enhance ungulate populations, which

provide important food for wolverines. However, the presence of roads and clearcuts alters wolverine use of the Analysis and these areas are generally avoided (Ruggiero et al. 1994).

It is unlikely for a wolverine home range to occur within or near the Analysis area, given wolverine's intolerance to human activity. Parts of the Grand Mesa and vicinity may have once provided refugia habitat for wolverine, but are now heavily used by people year-round.

3.4.12 Environmental Effects North American wolverine No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed.

Given the level of human uses within the Analysis Area year-round, it is highly unlikely that a wolverine might use all or part of the Grand Mesa as part of a larger home range.

Determination: Because it is unlikely for wolverine to occur within the heavily used GMNF, the proposed project would have no impact on wolverine.

3.4.13 Environmental Effects North American wolverine All Action Alternatives

Given the level of human uses within the Analysis Area year-round, it is highly unlikely that a wolverine might use all or part of the Grand Mesa as part of a larger home range.

Determination: Because it is unlikely for wolverine to occur within the heavily used GMNF, the proposed project would have no impact on wolverine.

3.4.14 Cumulative Effects North American wolverine

Cumulative effects to potential wolverine and their habitat within the Analysis area and vicinity include increasing recreational use (back-country skiing, high performance snowmobile use in difficult terrain, snowshoeing, off-route hiking, ATV and other 4WD use, and mountain biking), which threaten the integrity of any potential security habitats for species intolerant to human intrusion.

3.4.15 Affected Environment Fringed Myotis

This bat is a western species, ranging from the Isthmus of Tehuantepec in Mexico north to British Columbia, Montana, and Wyoming. In Colorado, they apparently occur as scattered populations at moderate elevations on the Western Slope, along the foothills of the Front Range and mesas of southeastern Colorado. Maximum elevation of known populations is 7,500 feet. The fringed myotis is a species of coniferous forest and woodland at moderate elevations in Colorado. Records of occurrence are few and the species isn't common in the State, but is perhaps widely distributed. Typical vegetation of their habitat includes ponderosa pine, pinyon/juniper, greasewood, saltbush and scrub oak. Habitat features of primary concern are roosting sites, particularly those used for hibernacula and nurseries. Those sites include mines, buildings, caves, and other structures. Available roosting sites within the project area include natural cracks and crevices in rock outcrops and rim rock.

There are no mineshafts, buildings, or caves. Individual trees used for day roosting could include both live and dead trees with cracks or sloughing bark.

Hibernation occurs in caves and buildings. There have not been any site-specific surveys conducted within the project area to determine the presence of this species. No population data is available on the current status and trend of this species on the Forest.

3.4.16 Environmental Effects Fringed Myotis No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed. Much of the Grand Mesa National Forest is higher than known populations of fringed myotis exist, therefore, habitat is limited.

3.4.17 Environmental Effects Fringed Myotis Proposed Action Alternative

Under the Proposed Action there would be no direct or indirect effects to fringed myotis from restricting mountain bike use to the currently existing roads and trails. Additionally, much of the Grand Mesa National Forest is higher than known populations exist.

Determination: No impact

3.4.18 Environmental Effects Fringed Myotis Alternatives 2 and 3

Alternatives 2 and 3: There would be no impacts to fringed myotis from the newly created mountain bike routes on the top of the Grand Mesa, as they are not within suitable habitat.

Determination: No impact

3.4.19 Cumulative Effects Fringed Myotis

Cumulative effects to possible fringed myotis within the analysis area include disturbances to potential roosting sites such as that which may be found in conjunction with private residences or other buildings or removal of trees with sloughing bark such as in timber sales or fuels treatments.

3.4.20 Affected Environment Townsend's big-eared bat

This is a bat of western North America, ranging from southern British Columbia to southern Mexico. Townsend's big-eared bats can be found throughout Colorado except in the eastern plains. Its distribution seems to be determined by the availability of roosts such as caves, mines, tunnels, crevices and masonry structures, and suitable roosting sites are one of the primary limiting factors to this species.

The Townsend's big-eared bat is generally solitary or gathers in small groups, although during the summer females may form larger maternity colonies. In Colorado they occur in mines, caves and structures in woodlands and forests at elevations up to 9,500 feet.

Surveys have not been conducted to determine the presence of the Townsend's big-eared bat within the Analysis area. No data is available on the current status and trend of this species on the Forest. Populations of Townsend's big-eared bat are highly susceptible to disturbance

in their nursery and hibernacula. Roost sites need to be protected for species conservation. Those sites include mines, buildings, caves, and other structures. There are not very many mineshafts or caves within the Analysis Area, but there are many structures and buildings. Available natural roosting sites within the Analysis area include natural cracks and crevices in rock outcrops.

3.4.21 Environmental Effects Townsend's big-eared bat No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed. There would be no direct or indirect effects to Townsend's big-eared bat from unrestricted mechanized use.

3.4.22 Environmental Effects Townsend's big-eared bat Proposed Action Alternative

There would be no direct or indirect effects to Townsend's big-eared bat from restricting mountain bike use to the currently existing roads and trails.

3.4.23 Environmental Effects Townsend's big-eared bat Alternatives 2 and 3

There would be no impacts to Townsend's big-eared bat from the newly created mountain bike routes on the top of the Grand Mesa, as they are not within suitable habitat.

Determination: No impact.

3.4.24 Cumulative Effects Townsend's big-eared bat

Destruction or disturbance of roost sites in buildings or structures or in rock crevices may be detrimental to possible Townsend's big-eared bat populations.

3.4.25 Affected Environment American three-toed woodpecker

Considered vulnerable in Colorado, three-toed woodpeckers have a circumpolar distribution in boreal forest habitat. Globally, this species is considered stable, yet these woodpeckers are locally distributed and occur nowhere in abundance. Limited North American Breeding Bird Survey (BBS) data indicate a relatively stable population (NatureServe 2004). In Colorado, these woodpeckers occur in a scattered distribution, reflecting the scattered distribution of older spruce and fir forests with decadent trees (Kingery 1998). Wiggins (2004) mentions strong decreases in abundance in the Southern Rocky Mountains of Colorado.

Colorado Breeding Bird Atlas (BBA) data (Kingery 1998) and Wiggins (2004) indicate a strong habitat preference for spruce-fir forests, with only a handful of occurrences from ponderosa, lodgepole and aspen habitats. Wiggins (2004) found that old growth lodgepole pine habitat is also important in Colorado. Two other important habitat components are abundant insect populations and diseased trees (resulting from fire and/or insect epidemics). In Colorado, observations ranged from 7,000 to 12,000 feet with most occurring above 9,000 feet (Kingery 1998).

Three-toed woodpeckers nest in cavities in snags or live trees with dead heartwood. In the Rockies, three-toed woodpeckers will move into recently burned habitats or into insect infestations, but generally they stay in spruce-fir habitats (Wiggins 2004, Kingery 1998). In the years following a burn, three-toed woodpecker abundance may increase sharply as they forage on wood-borers that invade fire-killed trees. By five years after a fire, wood-borer populations have decreased and three-toed woodpecker populations diminish as they forage elsewhere. Once three-toed woodpeckers leave an area, they leave behind a host of cavities for secondary cavity nesting species (Kingery 1998).

All spruce-fir stands within the Analysis area are suitable for three-toed woodpeckers.

3.4.26 Environmental Effects American three-toed woodpecker No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed; therefore, three-toed woodpecker habitat would not be affected by continued unrestricted mechanized use.

3.4.27 Environmental Effects American three-toed woodpecker Proposed Action Alternative

Under the proposed action mechanized travel would be restricted to existing designated routes. As there would be no change in habitats under the Proposed Action, there would be no impact to three-toed woodpeckers.

Determination: No impact.

3.4.28 Environmental Effects American three-toed woodpecker Alternatives 2 and 3

Alternatives 2 and 3 would have very minor effects on three-toed woodpeckers, with 1 acre of potential habitat lost to trail construction.

Determination: Because the proposed project would not affect the availability of cavity-nesting and foraging habitat within the geographic area, the proposed project would have no impact on American three-toed woodpeckers.

3.4.29 Cumulative Effects American three-toed woodpecker

Three-toed woodpecker habitat may be detrimentally affected by fire suppression because of the decreased availability of snags in burned-over areas. However, fire suppression also produces favorable conditions for insect outbreaks, especially wood-borers, a preferred prey for woodpeckers (Wiggins 2004, Kingery 1998). Salvage logging of insect-infested or diseased forest or of spruce-fir stands may reduce or eliminate habitat for this species.

3.4.30 Affected Environment Bald eagle

Bald eagles breed in Canada, Alaska, Baja California, New Mexico, Arizona, the Texas Gulf Coast, Florida and in localized pockets throughout the Great Basin and prairie and plains

regions in interior North America, including Colorado, Nebraska and Kansas. Non-breeding habitat occurs generally throughout the breeding range except in the far north, most commonly from southern Alaska and southern Canada southward. Bald eagles occur upstream and downstream from the wintering bald eagles may be found along ice-free sections of the Colorado River and the larger tributaries.

Breeding habitat most commonly includes areas close to bodies of water that reflect the general availability of primary food sources including fish, waterfowl, and seabirds. In Colorado and Wyoming, forest stands containing nest trees varied from old-growth ponderosa pine to narrow strips of riparian vegetation surrounded by rangeland (NatureServe 2004).

Bald eagles preferentially roost in conifers or other sheltered sites in winter and typically select larger, more accessible trees. Winter roost sites vary in their proximity to food resources (up to 33 km) and may be determined to some extent by a preference for a warmer microclimate at these sites. Wintering areas are commonly associated with open water though in some areas eagles use habitats with little or no open water if other food resources (e.g. rabbit or deer carrion) are readily available. Winter roosts tend to avoid areas with nearby human activity (boat traffic, pedestrians) and development (buildings) (NatureServe 2004).

Bald eagles migrate through the higher elevations in Colorado during the fall and winter months along the Colorado and Eagle Rivers. They have been documented nesting and winter roosting in the valleys below the Grand Mesa National Forest with incidental foraging on and near the Forest. The Analysis area provides fall and some winter foraging and roosting habitat for bald eagles. Bald eagle production and wintering in Colorado is in an upward trend (Craig 2001).

According to NatureServe (2004) major threats include habitat loss, disturbance by humans, biocide contamination, decreasing food supply, and illegal shooting.

3.4.31 Environmental Effects Bald eagle No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed. Bald eagle habitat would not be affected by continued unrestricted mechanized use.

3.4.32 Environmental Effects Bald eagle All Action Alternatives

Mountain biking activities would not directly affect bald eagles. The new construction of routes in Alternatives 2 and 3 would not impact bald eagle habitats.

Determination: No impact.

3.4.33 Cumulative Effects Bald eagle

Cumulative effects to bald eagles in the Analysis area and adjacent lands are many, including development of outstanding water rights (effects to foraging habitat), expansion of transmission and distribution lines (collision and electrocution hazard), and increasing recreational use near fall and winter habitat (disturbance).

3.4.34 Affected Environment Boreal Owl

Considered imperiled in Colorado, boreal owls occupy a circumpolar distribution in Northern hemisphere boreal forests. In North America, boreal forests in Colorado and northern New Mexico delineate the southernmost extent of their distribution. Although boreal owls are considered globally secure, their trend is unknown due to unreliable population estimates and movements caused by fluctuations in prey base abundance and distribution (NatureServe 2004). Boreal owls appear to be widely distributed in Colorado between 9,200 and 10,400 feet (Hayward 1994).

In Colorado, boreal owls utilize late-successional, multi-layered habitats of spruce-fir and lodgepole pine interspersed with meadows. Aspen and mixed conifer stands may also be used. Boreal owls are secondary cavity nesters, usually occupying cavities excavated by pileated woodpeckers or flickers. Nest cavities are commonly found within snags with a diameter of at least 10 inches and may be used in consecutive years. In winter, boreal owls appear unselective of roost sites, while in summer thermal stress appears to drive selection of cool roost sites with high canopy cover, basal area and tree density. Average home ranges are about 2,600 acres in the summer and 3,700 acres in winter (Hayward 1994, NatureServe 2004). Boreal owls have been documented from many areas within the Analysis Area in spruce-fir habitats. 200 boreal owl nest boxes have been placed on the Grand Mesa and a few are used for nesting every year, even though there are natural cavities as well.

A major threat to boreal owls includes the indirect effects of forest harvesting practices. Timber harvest may reduce primary prey populations (particularly Red-backed voles after clear-cutting), remove forest structure used for foraging and roosting, and eliminate nesting cavities. The presence of nest cavities appears to be the primary limiting factor for boreal owls. Maintenance of late-successional spruce-fir forests with large snags, suitable roost trees, and adequate canopy closure are important considerations for boreal owl persistence in the analysis area (Hayward 1994, NatureServe 2004).

3.4.35 Environmental Effects Boreal Owl No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed. Boreal owl habitat would not be affected by continued unrestricted mechanized use.

3.4.36 Environmental Effects Boreal Owl Proposed Action Alternative

Under the Proposed Action there would be no new construction of trails, therefore there are no effects to boreal owl habitats.

Determination: Because the proposed action would not affect the current condition and distribution of boreal owl habitat within the project area or greater geographic area, the proposed project would have no impact on boreal owls.

3.4.37 Environmental Effects Boreal Owl Alternatives 2 and 3

There would be boreal owl habitat removal on approximately 1 acre total within the newly constructed routes of these alternatives.

Determination: Due to the very small loss of habitat, spread throughout 14 miles of new trail, there would be no impact to the boreal owl.

3.4.38 Cumulative Effects Boreal Owl

Previous and on-going timber harvests within the analysis area may reduce prey availability and eliminate trees with nest cavities used by boreal owls.

3.6.39 Affected Environment Brewer's sparrow

Considered apparently secure in Colorado, Brewer's sparrows are migratory birds found in the western provinces of Canada, through the western US and south into Mexico (NatureServe 2004). Brewer's sparrow is a common to fairly common spring and summer visitor in Mesa and Delta County's sagebrush and pinyon-juniper woodlands, BBA records document Brewer's sparrow occurrence in the Analysis area vicinity with possible breeding (Kingery 1998). Breeding is strongly associated with sagebrush habitat but can also occur in other shrub or pinyon-juniper habitats (NatureServe 2004). Sagebrush habitat on National Forest Lands in Region 2 is relatively stable (USDAFS SCP 2003). Suitable Brewer's sparrow sagebrush habitat occurs in the analysis area and is likely to be occupied during the summer breeding season.

BBS data for 1966-1996 show significant and strong survey-wide declines in California, Colorado, Montana, Nevada, Oregon and Wyoming with significant decline evident in Idaho (NatureServe 2004). Direct causes of widespread decline on breeding grounds are uncertain; but possibly linked to widespread degradation of sagebrush habitats in the western US, especially on private lands (NatureServe 2004, USDAFS SCP 2003).

Brewer's sparrow is threatened by large-scale reduction and fragmentation of sagebrush activities due to land conversion, new roads and utilities, and widespread burning or other methods of sagebrush control. Invasion of non-native grasses, especially cheatgrass, can escalate the fire cycle, converting shrublands into annual grasslands. Brewer's sparrows are occasional hosts for brown-headed cowbirds; this rate can be elevated in the presence of livestock. Egg, nestling and adult predators are many and include ground squirrels, shrikes, ravens, magpies, weasels, chipmunks, many snake species, kestrels and prairie falcons.

3.4.40 Environmental Effects Brewer's sparrow No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed. Brewer's sparrow habitat may be negatively affected by continued unrestricted mechanized use in sagebrush habitats. Cross country travel in sagebrush habitat may negatively affect Brewer's sparrow.

3.4.41 Environmental Effects Brewer's sparrow All Action Alternatives

Restricting mountain biking activities to existing routes would not affect Brewer's sparrow. The new construction of routes proposed in Alternatives 2 and 3 would not occur within Brewer's sparrow habitats.

Determination: No Impact.

3.4.42 Cumulative Effects Brewer's sparrow

Cumulative effects to Brewer's sparrow habitat in the project area include historic conversion of sagebrush habitats to irrigated hay meadows on adjacent private lands, and additional contemporary loss of sagebrush habitat from housing development and brush-beating projects to improve grass production on private lands immediately below Forest boundary. Other impacts to Brewer's sparrow within the analysis area include fire, grazing, and other disturbances causing non-native grasses to become established in their habitat.

3.4.43 Affected Environment Flammulated owl

The flammulated owl inhabits old growth or mature ponderosa pine forests but will also inhabit other conifer forests mixed with mature aspen. In some areas, birds are seen in pure aspen; some also occur in old-growth pinyon/juniper woodlands (Andrews and Righter 1992). They prefer forests with dense canopy covers close to relatively open areas. They are an uncommon to common summer resident in foothills and lower mountains and appear to be more common than most observers have realized. They appear to be most common in western and southern Colorado. They are most commonly found between 4,500-7,800 feet but will range up to 10,000 feet. They nest in old flicker holes or other woodpecker holes. They are found throughout the Grand Mesa National Forest in suitable habitat, which is aspen or aspen mixed with conifer or shrubs.

3.4.44 Environmental Effects Flammulated owl No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed. Flammulated owl habitat would not be affected by continued unrestricted mechanized use.

3.4.45 Environmental Effects Flammulated owl Proposed Action Alternative

There would be no new construction of trails under this alternative; therefore, there are no effects to flammulated owl habitats.

Determination: No impact to flammulated owl.

3.4.46 Environmental Effects Flammulated owl Alternatives 2 and 3

There would be flammulated owl habitat removal on approximately 1 acre total for the newly constructed routes.

Determination: May adversely impact individuals, but is not likely to result in a loss of viability on the Planning area, nor cause a trend to federal listing for flammulated owl.

3.6.47 Cumulative Effects Flammulated owl

On-going and future timber harvests within the analysis area may remove trees with nest cavities used by flammulated owls.

3.4.48 Affected Environment Lewis' woodpecker

Strictly a species of western North America, the Lewis' woodpecker breeds from Colorado west to the Pacific and from southern British Columbia to Arizona and New Mexico. In Colorado, the Lewis' woodpecker currently occupies the southern portion of the State and along the edge of the Front Range from Denver to Wyoming. Surveys on the GMUG National Forest have documented their occurrence on the Uncompahgre Plateau and portions of the Gunnison dominated by ponderosa pine forest habitat.

As woodpeckers that specialize in flycatching, they need open habitats for foraging. They prefer open-grown ponderosa pine forests, burnt-over areas with abundant snags and stumps, riparian and rural cottonwoods, and pinyon/juniper woodlands.

Preferred nesting sites are soft snags that can be easily excavated. Lewis' woodpeckers do not migrate to warmer climates but rather move to different localities. Their diet shifts from insects to berries, seeds, and acorns which they cache in holes and crevices near their nest sites. This species has disappeared from many of its former breeding grounds in the western United States, and declines are probably still occurring today.

3.4.49 Environmental Effects Lewis' woodpecker No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed. Lewis' woodpecker habitat would not be affected by continued unrestricted mechanized use.

3.4.50 Environmental Effects Lewis' woodpecker All Action Alternatives

Habitat for Lewis's woodpecker would not be affected by any of the alternatives.

Determination: No impact for Lewis' woodpecker.

3.4.51 Cumulative Effects Lewis' woodpecker

Negative impacts to Lewis' woodpecker within the analysis area may result from fire suppression efforts and post-fire hazard tree removal where nest sites could have been easily established.

3.4.52 Affected Environment Northern goshawk

Considered vulnerable in Colorado, the northern goshawk occurs throughout North America in the U.S., Mexico and Canada and circumpolar through Europe and Asia (NatureServe 2005). Northern goshawks inhabit mature forests of various cover types including aspen, lodgepole and ponderosa pine and spruce-fir. They may use marshes, meadows and riparian zones for foraging (NatureServe 2005, Kennedy 2003). Regardless of the cover type, goshawks require large blocks of forest for nesting and foraging. Goshawks tend to select nest trees on shallow slopes, flat benches in steep country, and fluvial pans on small stream junctions. Nest sites are often associated with small (<1 acre) openings (Kingery 1998).

In Colorado, goshawks occur at elevations of 7500 to 11,000 feet (NatureServe 2005, Kennedy 2003) and 64% of BBA breeding observations occurred in coniferous forests.

(Kingery 1998). On the GMUG, nesting occurs primarily in aspen or aspen mixed with conifer stands. According to Hoover and Wills (1987), goshawks may utilize all structural stages of spruce-fir, lodgepole pine Douglas-fir and aspen habitats for foraging year-round. Suitable cover habitat includes spruce-fir and lodgepole pine 4B, 4C and 5 structural stages and all structural stages of mature and late-successional aspen and Douglas-fir habitat. Therefore, the Analysis Area includes suitable goshawk foraging and cover habitat.

According to NatureServe (2005) and Kennedy (2003), trends are difficult to determine due to the paucity of historic quantitative data and because of biases inherent in the various methodologies used to track bird populations. Nesting range in the eastern U.S. is currently expanding as second-growth forests mature. In the western U.S., clearcut logging of old-growth forests, fire suppression, and catastrophic fire are postulated to be reducing habitat and thus populations, especially that of the subspecies *laingi*. However, conclusive data supporting the purported decline in the western U.S. are lacking. Christmas Bird Count (CBC) data (1959-1988), North American Breeding Bird Survey (BBA) data (1966-1996), and counts of migrants in the eastern U.S. (1972-1987) do not indicate any changes in populations.

Threats to Northern goshawk include timber harvest, fire suppression, grazing, and insect and tree disease outbreaks that can result in the deterioration or loss of nesting habitat (NatureServe2005). Although often persecuted historically, intentional shooting or trapping is no longer considered a significant source of mortality. The impact of falconry on goshawk populations is generally unknown; however, it is permitted in Colorado.

3.4.53 Environmental Effects Northern goshawk No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed. Northern goshawk habitat would not be affected by continued unrestricted mechanized use.

3.4.54 Environmental Effects Northern goshawk Proposed Action Alternative

There would be no change to goshawk habitats, as there would be no new trail construction.

Determination: No impact.

3.4.55 Environmental Effects Northern goshawk Alternatives 2 and 3

A loss of 1.5 acres of potential habitat for goshawks would occur under these alternatives.

Determination: May adversely impact individuals, but is not likely to result in a loss of viability on the Planning area, nor cause a trend to federal listing for northern goshawk.

3.4.56 Cumulative Effects Northern goshawk

Northern goshawks may be affected within the analysis area by timber harvest, fire suppression, grazing, and insect/ disease outbreaks that can result in the deterioration or loss of nesting habitat (NatureServe2005).

3.4.57 Affected Environment Northern harrier

Considered vulnerable in Colorado, northern harriers occur throughout North America and Eurasia, reaching their highest densities in the prairie-pothole region of the US and Canada (Kingery 1998). According to NatureServe (2005), overall global trend appears more or less stable, but southern Canada showed a significant annual decline of 4% from 1990-2000. Globally, northern harriers have declines where large wetlands and moist grasslands have been lost. Although population trends are mixed, habitat trends indicate a strong decline in available nesting and foraging habitats (NatureServe 2005).

In Colorado, northern harriers occur in lower elevation (5000 to 9000 feet) grasslands, agricultural lands and marshes but may range up to the tundra in the fall (Kingery 1998, NatureServe 2005). The most common breeding habitats are emergent wetlands, croplands and tall desert shrublands; their current distribution in Colorado favors the shortgrass prairie and lower elevations of the western slope (Kingery 1998). Suitable habitat exists in the wet meadows on the Grand Mesa and Battlement Mesa.

The greatest threat to northern harriers is the continued loss of wetland habitats from urban, residential, industrial and agricultural development (Kingery 1998).

3.4.58 Environmental Effects Northern harrier No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed. Continued unrestricted mechanized use in Northern harrier habitat may negatively affect foraging.

3.4.59 Environmental Effects Northern harrier Proposed Action Alternative

Northern harriers occur in the moist grasslands and meadows on the GMNF, primarily in the fall. Although northern harriers may use sagebrush shrublands, they more commonly nest and forage in open, moist meadows or agricultural areas. The moist meadows on top of the Grand Mesa are likely too high in elevation for nesting purposes, as they are still snow-covered when nesting season begins. Limited amounts of moist meadow habitats are available in the lower elevations of the forest and on private lands.

Determination: As this alternative does not propose any new construction of trails, there would be no impact to northern harriers.

3.4.60 Environmental Effects Northern harrier Alternatives 2 and 3

Because northern harriers are known from the Analysis Area, new trails through open moist meadows have the potential to affect harrier foraging habitat. Approximately 1.5 acres of grassland/meadow habitat would be affected by these alternatives. These affected acres are used primarily in the fall.

Determination: May adversely impact individuals, but is not likely to result in a loss of viability on the Planning area, nor cause a trend to federal listing for northern harriers.

3.4.61 Cumulative Effects Northern harrier

Northern harrier habitats on private lands adjacent to the forest will continue to be lost through potential land sales, rangeland mechanical treatments, hay production and livestock grazing, changes in agricultural use, conversion of agricultural uses to development, noxious weed invasion, and road and subdivision development.

3.4.62 Affected Environment Olive-sided flycatcher

Considered vulnerable in Colorado and declining globally, olive-sided flycatcher breeding habitat occurs throughout the US and Canada. Non-breeding territory occurs in central and South America as far south as Peru and Brazil, associated with the Andes Mountains and the Amazon Basin. Causes of olive-sided flycatcher decline are not well known but may be due to habitat changes in the breeding range and/or in migration and wintering areas. North American Breeding Bird Survey (BBS) data indicate declines since 1966 across much of North America and overall decline of 70% (3.6%/year) from 1966 to 1999 and 53% (3.7%/year) from 1980 to 1999. Declines are relatively similar across the range; the only state or province with a positive trend estimate for 1966-1999 is Alberta (3.1%); however, its trend estimate for 1980-1999 is negative (NatureServe 2005).

In Colorado, olive-sided flycatchers breed in coniferous forest habitat from 7,000 to 11,000 feet (Kingery 1998). In Mesa County, olive-sided flycatchers are considered fairly common summer visitors, using aspen and coniferous forests, meadows and riparian areas.

Found in forested habitats, snags and the presence of conifers appear to be the two most important components of olive-sided flycatcher habitat (Kingery 1998). Many structural stages of forest may be used if large snags are present for perching and foraging. Their diet is made up almost entirely of flying insects, and this bird has a special fondness for wild honeybees and other Hymenoptera. These flycatchers breed in old growth coniferous forest over most of their range, including Colorado. They are less abundant in aspen and aspen/conifer habitats. Nests are placed most often in conifers on horizontal limbs from 5 to 30 feet from the ground. Olive-sided flycatchers will use openings, old burns or clear-cuts for foraging habitat, as long as snags are present. BBA surveys found 84% of olive-sided flycatcher occurrences in coniferous forests (Kingery 1998).

As a neotropical migrant that may spend only three to four months of the year on its North American breeding grounds, the flycatcher is at risk from deforestation on its wintering grounds in Central and South America. Many studies in western North America conclude that this species is more abundant in some types of logged forest (especially those with suitable structural features retained) than it is in unlogged stands. A preliminary study in western Oregon documented that nest success was substantially higher in post-fire habitat than it was in several types of harvested forests. A forest dominated by dead trees would not support these flycatchers (NatureServe 2005).

Pesticide applications to control black flies, mosquitoes, or injurious forest insects could have a severe local impact upon the prey base of this flycatcher, both in North America and on its wintering grounds. Olive-sided flycatchers are a rare host to the brown-headed cowbird, with just three records of cowbird parasitism (NatureServe 2005).

Environmental Baseline: The presence of large snags for perching and foraging appears to be the most important habitat component for olive-sided flycatchers. BBA records document probable to confirmed olive-sided flycatcher breeding in the vicinity of the Analysis area (Kingery 1998). Olive-sided flycatchers are commonly recorded in coniferous habitats District-wide. Suitable olive-sided flycatcher habitat exists on the Analysis Area in mature spruce-fir forest.

3.4.63 Environmental Effects Olive-sided flycatcher No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed activities therefore continued cross-country mechanized would not affect the abundance and distribution of snags in the Analysis Area, nor disrupt existing foraging opportunities for olive-sided flycatchers.

3.4.64 Environmental Effects Olive-sided flycatcher Proposed Action Alternative

Although olive-sided flycatchers are present on the Analysis area during the summer season, mechanized travel restriction activities would not affect the abundance and distribution of snags in the Analysis Area, nor disrupt existing foraging opportunities for olive-sided flycatchers.

Determination: No impact to olive-sided flycatchers.

3.4.65 Environmental Effects Olive-sided flycatcher Alternatives 2 and 3

There would be olive-sided flycatcher habitat removal on approximately 1/2 acre total within the newly constructed routes.

Determination: May adversely impact individuals, but is not likely to result in a loss of viability on the Planning area, nor cause a trend to federal listing for olive-sided flycatcher.

3.4.66 Cumulative Effects Olive-sided flycatcher

Cumulative effects to olive-sided flycatcher in and near the analysis area include mortality of coniferous forests through beetle kill or spraying to control insects such as mosquitoes.

3.4.67 Affected Environment Purple martin

In Colorado, the purple martin is a common summer resident in the lower mountains of the west-central portion of the state (Andrews and Richter 1992). Nests of this species occur almost exclusively in cavities in mature aspen and only occasionally in mixed aspen/ponderosa pine or aspen/Douglas-fir forests (Andrews and Richter 1992). Nests are often within 1,000 feet of water, including small creeks and stock ponds, as they forage on insects, which are found in higher numbers near water.

Purple martins are aerial insectivores, meaning that they catch insects from the air. The birds are agile hunters and eat a variety of winged insects. Rarely, they come to the ground to eat insects.

Suitable nesting habitat for this species occurs in older-growth aspen on the Forest and in the project area.

3.4.68 Environmental Effects Purple martin No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No additional mechanized routes would be constructed in aspen habitats.

Determination: No impact to purple martin.

3.4.69 Environmental Effects Purple martin Proposed Action Alternative

There would be no new construction of trails under this alternative; therefore, there are no effects to purple martin habitats.

3.4.70 Environmental Effects Purple martin Alternatives 2 and 3

There would be purple martin habitat removal on approximately 1 acre total for the newly constructed routes.

Determination: May adversely impact individuals, but is not likely to result in a loss of viability on the Planning area, nor cause a trend to federal listing for purple martin.

3.4.71 Cumulative Effects Purple martin

As purple martins are dependent on aspen, Sudden Aspen Decline may be cumulatively impacting this species' nesting habitats within the analysis area. Spraying to control insects such as mosquitoes near the analysis area would reduce food supplies for Purple martin.

3.4.72 Affected Environment Boreal toad

Southern Rocky Mountains boreal toads occupy forest habitats between 7,500 and 12,000 feet. Boreal toads require breeding ponds, summer range, and overwinter refugia, within or adjacent to lodgepole pine or spruce-fir forests. Breeding habitat includes large lakes, glacial ponds, beaver ponds, man-made ponds, wetlands and roadside ditches and puddles. Egg placement occurs in shallow, quiet water where thermal effects of the sun on egg masses can be optimized. Young toads are restricted to moist habitats while adult toads can move several miles through upland habitats. Hibernacula include rodent burrows and beaver dams and lodges. Summer range includes upland forests and rocky areas with springs and seeps (Loeffler 2001).

Although once considered fairly common in most mountainous areas of the Southern Rocky Mountains, it is much less common today and absent from many historically occupied locations. Specifically, 1986-1988 surveys found that toads had disappeared from 83% of historic locations in Colorado and from 94% of Wyoming historic sites (Loeffler 2001). In

Colorado, evidence of boreal toad declines has been thoroughly documented (Loeffler 2001). The Grand Mesa has two populations of boreal toads, one of which has confirmed breeding.

Boreal toads in Colorado are part of the Southern Rocky Mountain (SRM) population, which were petitioned for federal listing. In 1995 the U.S. Fish and Wildlife Service determined that federal listing was warranted but this population was precluded from listing due to the need for action on higher priority species (NatureServe 2005). The September 2005 Final Rule found that the SRM population was not warranted for federal listing due to a lack of clear definition of a Distinct population Segment (DPS).

The greatest threat to boreal toad persistence appears to be the pathogen *Batrachochytrium dendrobatidis* (a chytrid fungus also referred to as Bd). Current thinking is that an unknown combination of environmental factors are causing sub-lethal stress in toads; stress is causing suppression of the immune system; and immune-suppression, cold body temperatures and a moist environment leads to infection and widespread mortality. Other secondary threats include alteration of habitat; aerial application of insecticides and piscicides; and predation from tiger salamanders, corvids, snakes, raptors, predaceous diving beetles, and others (Loeffler 2001).

3.4.73 Environmental Effects Boreal toad No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. Continued cross country travel may negatively impact boreal toad habitat in seeps, springs, streams or other wet environments.

3.4.74 Environmental Effects Boreal toad Proposed Action Alternative

No new trails would be constructed; therefore there would be no impact to boreal toad habitat under the Proposed Action.

3.4.75 Environmental Effects Boreal toad Alternatives 2 and 3

Fourteen miles of new trail would be constructed, much of which is in potential boreal toad habitat. Wetlands would be avoided, but some small streams may have to be crossed.

Determination: May adversely impact individuals, but is not likely to result in a loss of viability on the Planning area, nor cause a trend to federal listing for boreal toads.

3.4.76 Cumulative Effects Boreal toad

Unknown combinations of environmental factors would continue causing mortality of individuals until the chytrid fungus effects are better understood. Spraying to control insects such as mosquitoes near the analysis area would reduce food supplies for boreal toads.

3.4.77 Affected Environment Northern leopard frog

Northern leopard frogs can be found in springs, slow-moving streams, marshes, bogs, ponds, canals, floodplains, reservoirs and other lakes with rooted aquatic vegetation. They can also be found in wet meadow habitats in the summer. They overwinter underwater. Shallow, still, permanent water with good exposure to sunlight is needed for egg deposition and development. Leopard frog records from Colorado occur from 3500 to 11,000 feet but

exclude southeastern Colorado (Hammerson 1999). They are found within the Analysis Area in the Cheney Creek, Big Creek, and Leroux Creek areas.

Considered vulnerable in Colorado (NatureServe 2005), northern leopard frog range includes the southern provinces of Canada, south through the US to Texas (Hammerson 1999). Although still widespread and common in many areas, many populations have drastically declined, especially in the Rocky Mountains of Colorado, Wyoming and Montana. Similar declines have been reported for Washington, Oregon and Alberta (NatureServe 2005).

Threats to leopard frogs include habitat loss, over-harvest, and competition with and predation from introduced bullfrogs. Like many amphibians, leopard frog declines appear related to environmental changes that alter the frog's susceptibility to disease (e.g. red leg disease) (NatureServe 2005, Hammerson 1999).

3.4.78 Environmental Effects Northern leopard frog No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. Continued unrestricted cross country travel may impact Northern leopard frog habitat in seeps, springs, streams, canals, ditches or other wet environments.

3.4.79 Environmental Effects Northern leopard frog Proposed Action Alternative

No new trails would be constructed under this alternative; therefore, there would be no impact to northern leopard frog.

3.4.80 Environmental Effects Northern leopard frog Alternatives 2 and 3

Fourteen miles of new trail would be constructed in potential leopard frog habitat. Wetlands would be avoided, but some small streams may have to be crossed.

Determination: May adversely impact individuals, but is not likely to result in a loss of viability on the Planning Area, nor cause a trend to federal listing or a loss of species viability range wide.

3.4.81 Cumulative Effects Northern leopard frog

Continued competition/from introduced bullfrogs would continue to impact Northern leopard frogs. So far there are no known populations of bullfrogs on the forest. Leopard frog declines related to unidentified environmental changes which alter the frog's susceptibility to disease would continue until disease mechanisms are better understood.

3.4.82 Affected Environment Bluehead sucker

The bluehead sucker is native to the Colorado River Basin in Colorado, New Mexico, Arizona, Utah and Wyoming. Within Region 2, populations exist in western Colorado and south-central Wyoming. This species can occur in larger streams up to 8,500 ft. and requires moderate to fast velocities of water. Bluehead suckers and mountain suckers (C.

platyrhynchus) may occur sympatrically on the periphery of their distributions in smaller tributary streams (Ptacek 2005). Detailed information concerning the distribution, life history, population trends and community ecology of this species is relatively limited (Ptacek 2005). However, bluehead suckers have been documented in lower elevation streams on the Grand Mesa National Forest.

3.4.83 Environmental Effects Bluehead sucker No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No mechanized travel restriction would be implemented. Continued unrestricted cross country travel may impact Mountain Sucker through sedimentation of occupied reaches but it would not negatively affect Mountain Sucker population trends at the local or Forest-wide scale.

Determination: May adversely impact individuals, but is not likely to result in a loss of viability on the Planning Area, nor cause a trend to federal listing or a loss of species viability range wide.

3.4.84 Environmental Effects Bluehead sucker Proposed Action Alternative

Alternative 1 would restrict travel to existing designated routes thereby eliminating sedimentation effects from cross-country mechanized travel. There would be no effects to Bluehead sucker from the proposed action.

Determination: No impact to mountain suckers.

3.4.85 Environmental Effects Bluehead sucker Alternatives 2 and 3

Alternatives 2 and 3 may have short-term effects on bluehead sucker due to the potential for temporary increased sedimentation from the additional new routes, but it would not negatively affect bluehead sucker population trends at the local or Forest-wide scale.

Determination: May adversely impact individuals, but is not likely to result in a loss of viability on the Planning Area, nor cause a trend to federal listing or a loss of species viability range wide.

3.4.86 Cumulative Effects Bluehead sucker

As little is known about this species, it can only be assumed that anything that affects bluehead sucker habitat may impact the species. Management activities on the Grand Mesa generally occur at higher elevations than this species.

3.4.87 Affected Environment Colorado River cutthroat trout

Historically Colorado River cutthroat trout (CRCT) occupied portions of the Colorado River in Wyoming, Colorado, Utah, Arizona, and New Mexico. They were once present in portions of the Green, Yampa, White, Colorado, and San Juan Rivers. Their current distribution is likely constrained to headwater streams and lakes by diversions, summer thermal barriers, and nonnative species. Most of the lotic populations are in isolated headwater reaches with less than 30 cubic feet per second (cfs). Gradients are usually greater

than 4% and the majority of populations are located above 7,500 ft above mean sea level (CRCT 2001). A recent assessment of CRCT populations states that CRCT occupy approximately 14% of historical range (Hirsch et al. 2006).

Currently there are 32 conservation populations of Colorado River cutthroat trout (CRCT) known to occur in 22- 7th field watersheds on the GMUG. Two additional populations occur on BLM land adjacent to the GMUG Forest. Conservation Populations are restricted to approximately 96 miles of stream, with most populations occurring in tributaries of the North Fork of the Gunnison River. Streams on the GMUG support 27% of the known CRCT Conservation Populations in the Colorado, Dolores and Gunnison Geographic Management Units (GMUs). Existing populations are located in isolated headwater streams of generally 2-4 miles in length, and remain at risk for localized extirpations. Two CRCT Conservation Populations have been established in lakes totaling approximately 75 surface acres on the Grand Mesa; however, severe drought and dam reconstruction have likely affected the abundance of these populations. The total miles of stream occupied by CRCT on the Forest have increased 29% since 2001. However, this increase was largely due to the discovery of new CRCT Conservation Populations, and not from increases in abundance or dispersal of individual populations.

Habitat requirements for the Colorado River cutthroat appear to be similar with other cutthroat subspecies, and other North American trout (Joseph and Sinning 1977). CRCT live in clean, cool mountain streams, preferably of moderate (6 % or less) gradient. Colorado River cutthroats typically require water with high dissolved oxygen content, cool water temperatures in the summer, and clean gravel for spawning. In addition, they require riffle areas for food production, complex habitats for juveniles, pools for overwintering, and summer rest. Vegetation in the riparian zone needs to be abundant enough to provide shade and cover (Wesche et al. 1987). Colorado River cutthroat trout require year round stream flows to survive. Since most of the flow of regional streams comes as a springtime "pulse" from snowmelt, some streams provide good early-season but very poor late-season habitat.

Suitable habitat for CRCT and other trout species occur throughout the project area. Competition with non-native trout is considered to be the biggest threat to CRCT (Young 1995, Behnke 1992), and impacts to the distribution, abundance, and genetic integrity of CRCT are well documented (CRCT Task Force 2001; Young 1995). This interaction has led to competition, as well as hybridization of CRCT with other trout species, and local populations of "conservation", or genetically pure CRCT, are rare in the GMUG (USFS 2005a). Cutthroat and brook trout share similar habitat requirements, though spawning times differ. Brook trout are fall spawners and have been shown to have competitive advantages over CRCT (spring spawners), particularly at the juvenile life-history stage (Peterson et al 2004; Peterson and Fausch 2003). In addition, land management practices such as road construction, mining, recreation, and water use have all been shown to have adverse effects on CRCT habitat conditions and abundance (Meehan 1994).

3.4.88 Environmental Effects Colorado River cutthroat trout No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. Continued unrestricted cross country travel may

impact Colorado River cutthroat trout through sedimentation of occupied reaches but it would not negatively affect CRCT population trends at the local or Forest-wide scale.

3.4.89 Environmental Effects Colorado River cutthroat trout Proposed Action Alternative

Due to their restrictive habitat, CRCT have short home ranges and therefore, even a small impact to available habitat could have an effect on local populations (Heggenes et al. 1991). The Proposed Action would have no changes from the current situation.

Determination: No impact.

3.4.90 Environmental Effects Colorado River cutthroat trout Alternatives 2 and 3

Alternatives 2 and 3 may have short-term effects on CRCT due to the potential for temporary increased sedimentation from the additional new routes, but it would not negatively affect CRCT population trends at the local or Forest-wide scale.

Determination: May adversely impact individuals, but is not likely to result in a loss of viability on the Planning Area, nor cause a trend to federal listing or a loss of species viability range wide.

3.4.91 Cumulative Effects Colorado River cutthroat trout

Numerous land use actions (e.g., oil and gas activity, recreational activity, livestock grazing, road building, housing development, and water use) on State and private lands surrounding the Grand Mesa National Forest are reasonably certain to occur over the next several years. Colorado River cutthroat trout habitat could be directly affected through possible habitat degradation and loss with these activities, adding to the cumulative effects of potential habitat degradation occurring throughout the Forest.

3.5 Management Indicator Species Wildlife/Fish _____

Management Indicator Species (MIS) are wildlife species identified to aid the Forest Supervisor in identifying how implementation of the GMUG Forest Plan has affected long-term population trends of representative wildlife species. Tables 3.5a and 3.5b, below, reflects GMUG National Forest Management Indicator Species, that were chosen in a Forest Plan amendment in May, 2005. The tables also display an abbreviated description of their habitat, and the presence/absence of the habitat and/or species in the Project Area. Monitoring and evaluation are separate, sequential activities required by National Forest Management Act (NFMA) regulations that determine how well Forest Plan objectives have been met, and how closely management standards and guidelines have been implemented for (MIS).

Table 3.5a. Management Indicator Species on GMUG National Forests

Common Name	Scientific Name	Habitat Association	Habitat or Species Present Within the Project Area?
Mammals			
Rocky Mountain elk	<i>Cervus elaphus</i>	Early succession spruce-fir, Douglas-fir, lodgepole, aspen, mountain shrub. Also MIS for travel mgmt.	Habitat – yes Species – yes
Abert’s squirrel	<i>Sciurus aberti</i>	Late-succession ponderosa pine	Habitat – no Species – no
American marten	<i>Martes americana</i>	Late-succession spruce-fir, lodgepole pine	Habitat – yes Species – yes
Birds			
Red-naped sapsucker	<i>Sphyrapicus nuchalis</i>	Mixed conifer and deciduous forest, especially around aspens	Habitat – yes Species – yes
Brewer’s sparrow	<i>Spizella breweri</i>	Sagebrush communities, brushy plains	Habitat – yes Species – yes
Merriam’s wild turkey	<i>Meleagris gallopavo merriami</i>	Oak scrublands and pinyon-juniper woodlands	Habitat – yes Species – yes
Northern goshawk	<i>Accipiter gentilis</i>	Late-succession aspen	Habitat – yes Species – yes
Fish			
Colorado River cutthroat trout	<i>Oncorhynchus clarki pleuriticus</i>	Aquatic and riparian habitats	Habitat – yes Species – yes
Rainbow trout	<i>Oncorhynchus mykiss</i>	Aquatic and riparian habitats	Habitat – yes Species – yes
Brown trout	<i>Oncorhynchus trutta</i>	Aquatic and riparian habitats	Habitat – yes Species – yes
Brook Trout	<i>Salvelinus fontinalis</i>	Aquatic and riparian habitats	Habitat – yes Species – yes

One MIS species, the Abert’s squirrel, was eliminated from detailed discussion because suitable habitat for this species was not identified within or immediately adjacent to the Analysis Area. Abert’s squirrels are ecologically dependant on ponderosa pines for both nesting sites and food, and thus are restricted to open montane forests (Fitzgerald et al. 1994). The Proposed Action would not occur within or near late succession ponderosa pine. The Analysis Area does not provide the type of habitat described above. Consequently, the species is eliminated from further consideration in this MIS Evaluation.

Table 3.5b. Species Evaluated, Associated Habitats

Habitat	Management Indicator Species Analyzed
Pinyon-juniper, oakbrush and sagebrush associated	Merriam's wild turkey Brewer's sparrow
Aspen dependant/associated	Red-naped sapsucker Rocky Mountain elk Northern goshawk
Spruce-fir dependant or associated	American marten Rocky Mountain elk
Aquatic dependant	Colorado River cutthroat trout Rainbow trout Brown trout Brook trout

3.5.1 Pinyon-juniper, oakbrush and sagebrush associated MIS

The following species are representative of the pinyon-juniper, oakbrush and sagebrush communities: Merriam's wild turkey and Brewer's sparrow.

3.5.2 Affected Environment Merriam's wild turkey

The Merriam's turkey has the widest distribution and is the most common subspecies of the wild turkey in North America. Merriam's turkeys are distributed throughout 11 western states in North America, and they have been confirmed breeding in suitable habitats on the Forest. Merriam's turkeys are permanent residents on the Forest and exhibit altitudinal/seasonal migrations. The wild turkey is considered globally secure by the Natural Heritage Program due to its wide distribution across North America.

Turkeys use a variety of habitats over the course of a year, depending on the season. This species benefits from maximum structural diversity within and between stands. Key turkey habitat characteristics include outcrops, logs, or shrubs to provide horizontal cover for nesting; trees greater than 25 cm DBH with large horizontal branches for roosting; and dense conifer stand (ponderosa and pinyon pine/juniper) in winter for thermal cover and pine seed forage (Rumble and Hodorff 1993). Overall, Merriam's turkey populations achieve their greatest abundance in the pine-oak-grassland vegetative associations.

The Merriam's turkey (also referred to as "wild turkey") has been identified as a Management Indicator Species (MIS) in 2005, on the GMUG, and was selected as an indicator primarily for mountain shrub, Gambel oak, pinyon-juniper and lower elevation ponderosa pine habitat types, although the species is known to use forest-meadow edges, aspen, and aspen/mixed conifer habitats during the summer. On the GMUG, the majority of

primary turkey habitat occurs within the Uncompahgre Plateau Geographic Area. Some primary turkey habitat also occurs within the Grand Mesa Geographic Area. In the GMUG 2005 MIS assessment Report for Merriam's turkey, primary and secondary habitat are modeled based on several literature sources. (USDA Forest Service 2005) This assessment is incorporated by reference. Wild turkeys utilize a variety of habitats and are found only locally on the Grand Mesa. Wild turkeys are known to occur in the Analysis Area, and occur locally in the pinyon-juniper and oakbrush habitats. In the summer they occur occasionally in the aspen and spruce-fir habitats as well. Turkeys utilize insects, fruits, nuts, and seeds primarily.

The following table is the modeled acres of turkey habitat on the Forest, based on the primary and secondary habitat referred to in the assessment. Total acres of summer feeding and cover, nesting, brood rearing, roosting, and winter feeding and cover habitat based on habitat quality are provided in Table 3.5.2.

Table 3.5.2 Acres of turkey habitat on the Forest based on habitat parameters and habitat quality.

Habitat Parameter ¹	Habitat Quality		Total Acres ¹
	Primary	Secondary	
Summer feeding/cover	490,131	1,281,664	1,771,795
Nesting	9,587	101,595	111,182
Brood/rearing	718,345	45,879	764,224
Roosting	43,974	200,047	244,021
Winter feeding/cover	293,157	27,912	321,069

¹ Some overlap occurs between the different habitat types, thus acres should be analyzed separately for each habitat parameter, rather than combined. Combining acres for different habitat parameters will result in an overestimate of turkey habitat on the Forest.

The above habitat modeling criteria reflect second-level analysis because we are relying predominantly on the dominant species of vegetation and overstory canopy cover to predict suitable Merriam's turkey habitat, although slope and aspect criteria for nesting, brood rearing, and winter habitat further refines those habitat types. Rumble and Anderson (1992) determined that habitat selection patterns of Merriam's turkeys were best described when habitats were stratified by dominant species of vegetation and overstory canopy cover. Rumble and Anderson (1992) concluded that implications for forest management activities on turkeys at this level of habitat stratification could be made.

Merriam's wild turkey populations on the forest are specific to local areas, and are not expected to be occupying the entire potential habitat available. The Analysis Area has wild turkeys using the area year-round.

According to the Breeding Bird Survey (BBS), populations appear to be in a significant upward trend in the United States. Based on BBS trend data for the period 1966 to 2004, turkeys have exhibited a significant positive trend of 13.3%. Within the state of Colorado and

the Southern Rockies physiographic region, turkey populations have exhibited similar, long-term upward trends. The Colorado Division of Wildlife has conducted turkey reintroductions adjacent to the Forest in the last 16 years that has contributed to increased local turkey populations and expanded turkey distributions. Turkey populations on and adjacent to the Forest are apparently self-sustaining and healthy enough to support both a spring and a fall hunting season.

3.5.3 Environmental Effects Merriam's wild turkey No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. Based on current population trends, cross-country mechanized travel in pinyon-juniper and oakbrush habitats does not appear to be negatively impacting turkeys. No change in the population trend or habitats expected to occur on the GMUG due to selection of the No Action Alternative.

3.5.4 Environmental Effects Merriam's wild turkey All action Alternatives

High cover and forage values for wild turkey suggest high quality turkey habitat is present and would not be affected by the action alternatives. No change in the population trend of Merriam's turkey is expected to occur on the GMUG due to the proposed action or alternatives.

The proposed action would not affect potential summer or winter habitat for wild turkey, and would not result in a defined change in population numbers or trends at project or Forest scales. The proposed project is consistent with Forest Plan direction as it relates to MIS.

3.5.5 Cumulative Effects Merriam's wild turkey

Numerous land use actions (e.g., oil and gas activity, recreational activity, road building, housing development, etc.) on State and private lands surrounding the Grand Mesa National Forest are reasonably certain to occur over the next several years. Where these activities fall within wild turkey habitats, these land uses have the potential to affect turkeys through loss or degradation of summer, winter, and nesting habitat, direct mortality during activities, and/or displacement from preferred habitats.

3.5.6 Affected Environment Brewer's Sparrow

Brewer's sparrows breed primarily in sagebrush habitats and are considered to be sagebrush obligates by Braun et al. (1976). However, Brewer's sparrows may also be found in high desert scrub (greasewood) habitats, particularly where these habitats are adjacent to sagebrush.

On the Forest, Brewer's sparrow habitat is widely distributed but occurs in small, often isolated habitat patches. Primary habitat includes areas dominated by big sagebrush (*Artemisia tridentata* spp.), encompassing approximately 40,457 acres. Secondary habitat consists of approximately 52,850 acres and is comprised of mountain shrub (willow, mountain mahogany, snowberry, or other woody shrublands other than sagebrush), sagebrush transition areas, and pinyon-juniper woodlands containing large meadows with a shrubby component. Brewer's sparrows are most abundant in ecologically healthy shrub communities consisting of tall shrubs in a clumped distribution.

The Brewer's sparrow is considered globally "secure" by the Natural Heritage Program due to its wide distribution across North America, yet according to the Breeding Bird Survey, populations have declined by over 50 percent during the past 25 years (Holmes and Johnson 2005). Within Region 2 and the state of Colorado, Brewer's sparrow populations have exhibited similar long-term declines, exceeding national trends. Brewer's sparrows have been detected on seven Breeding Bird Survey routes on the Forest, with an insignificant decline observed within the Uncompahgre Plateau Geographic Area, insignificant increases observed within the North Fork and Grand Mesa Geographic Areas, and an insignificant increase observed within the Gunnison Basin Geographic Area. Single site analysis on Breeding Bird Survey routes within the Forest may not be valid due to low sample size and the amount of suitable Brewer's sparrow habitat sampled by the routes; from 1966-2003, only three percent (3,055 ac) of all sagebrush habitat on the Forest (101,838 ac) was sampled by the Breeding Bird Survey. On the Forest, from 1999 to 2004, the Rocky Mountain Bird Observatory (RMBO) detected 82 Brewer's sparrows on 11 transects, primarily in grassland and sagebrush dominated habitat types. Low detection rates of Brewer's sparrows by the RMBO are likely attributed to a lack of sampling effort in sagebrush habitats.

3.5.7 Environmental Effects Brewer's Sparrow All Alternatives

The effects of mountain biking in sagebrush habitats are relatively unknown. There may be indirect effects of human activities causing displacement of Brewer's sparrows, especially during the breeding season. However, the existing situation of no restrictions at all to mountain biking has more potential for impacts to Brewer's sparrow than any of the alternatives, which would restrict mountain bikes to designated roads and trails.

3.5.8 Cumulative Effects Brewer's Sparrow

Brewer's sparrow population viability is likely linked to extensive alteration of sagebrush shrub-steppe habitat (Holmes and Johnson 2005). Primary influences include activities that have a transformative effect on sagebrush habitat such as agricultural conversions, mechanical treatments of sagebrush, livestock grazing, and alteration of natural fire regimes and invasion by exotic plants (Holmes and Johnson 2005). Habitat loss and fragmentation due to development (oil and gas, etc) also can negatively affect the species.

3.5.9 Affected Environment Aspen Dependent MIS

According to the GMUG Forest Plan (USFS 1991a), aspen (*Populus tremuloides*) woodlands dominate 722,337 acres in the GMUG National Forests or roughly 24 percent of the total GMUG Forest area (2,953,186 acres). Of this, approximately 116,965 acres of aspen woodlands are within the Grand Mesa National Forest (GMNF) (3.9% of GMUG). The dense understory vegetation of the aspen woodlands is dominated by snowberry (*Symphoricarpos albus*), tall larkspur (*Delphinium occidentale*), Colorado currant (*Ribes coloradense*), and white-stemmed gooseberry (*Ribes inerme*).

3.5.10 Affected Environment Red-naped Sapsucker

The red-naped sapsucker is a woodpecker that breeds in montane coniferous forests, aspen forests and montane riparian woodlands of the western U.S. and southwestern Canada. The species winters in Baja California and western Mexico. In Colorado, the red-naped sapsucker

breeds primarily in aspen. In the summer, the species is commonly found along riparian woodlands at mid-elevations, and in aspen stands. In Colorado, red-naped sapsuckers forage in aspen, willows and cottonwoods close to their nest sites, which are almost exclusively in mature aspen stands. Typical nest stands, dominated by large aspen, have a variety of diseases that create the heart rot needed for suitable cavity excavation (Kingery 1998). Nest stands have trees infected with shelf or heartwood fungus (for drilling nest cavities) and nearby willow stands (for drilling sap wells). In mountainous areas in which there are no other woodpecker species, sapsuckers play an important ecological role as they are the sole providers of nesting cavities for the myriad species that prefer and/or require them.

On the GMUG National Forest primary habitat includes areas dominated by aspen, cottonwood, and willow vegetation, encompassing approximately 26% (825,720 acres) of the forest; and, secondary habitat consists of approximately 21% (704,772 acres) of the forest and is comprised of Douglas-fir, lodgepole pine, and ponderosa pine (USFS 2005). Red-naped sapsuckers are abundant during the breeding season on the GMUG. Nesting and foraging habitat does occur in the Analysis Area.

According to BBS, populations appear to be stable or increasing in the United States, with areas of local declines. From the period 1966 to 2004, red-naped sapsuckers have exhibited a positive trend of +4.3%. Within Colorado, populations have exhibited similar but higher upward trends (Sauer et al. 2005).

3.5.11 Environmental Effects Red-naped Sapsucker No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. No new routes would be constructed removing habitat and populations are stable/increasing with exiting cross-country mechanized travel; therefore, no direct or indirect effects red-naped sapsucker would occur from continuing mechanized travel under this alternative. The MIS objectives for red-naped sapsucker in the Forest Plan would be met.

3.5.12 Environmental Effects Red-naped Sapsucker All Action Alternatives

The action alternatives would have negligible effects on red-naped sapsuckers or their habitat. The effects from the proposed action or any alternatives are of small magnitude in the aspen habitats, and would not result in a Forest-wide decrease in trends of populations levels. The MIS objectives for red-naped sapsucker in the Forest Plan would be met.

3.5.13 Cumulative Effects Red-naped Sapsucker

Numerous land use actions (e.g., oil and gas activity, recreational activity, road building, housing development, etc.) on State and private lands surrounding the Grand Mesa National Forest are reasonably certain to occur over the next several years. Where these activities fall within aspen habitats, these land uses have the potential to affect the red-naped sapsucker through loss or degradation of habitat, and/or displacement from habitat. Also, red-naped sapsuckers may experience habitat degradation from declining aspen stands within the analysis area as a result of sudden aspen decline.

3.5.14 Affected Environment Rocky Mountain Elk

Elk are found throughout the western two-thirds of Colorado, generally at elevations above 6,000 feet. Generalist feeders, elk are both grazers and browsers. Common forage species consist of grasses, sedges, forbs, willow (*Salix* spp.), serviceberry (*Amelanchier* spp.), sagebrush (*Artemisia* spp.), chokecherry (*Prunus virginiana*), maple (*Acer* spp.), fir (*P. menziesii* and *Abies* spp.), etc. Mountain grasses and shrubs compose most of the elk winter diet, with the former becoming of primary importance in the spring months. Forbs become increasingly important in late spring and summer, and grasses again dominate in the fall (Kufeld 1973). Foraging areas occur near the Project Area within the isolated shrub/grassland meadows and are of great value to elk populations in the area, as they provide a critical source of nutrition, particularly in winter. Elk usually feed actively from predawn darkness to about midmorning and again during the late afternoon towards dusk. They often bed on mountain slopes where they are afforded a view of the surrounding area and rising thermals carry the scent of other wildlife below (Fitzgerald et. al. 1994).

The GMNF is used by elk primarily as spring, summer, and fall range (USFS 2005a). Nearly all vegetation communities in the GMNF and the entire Analysis Area are considered suitable elk habitat. The Analysis Area supports most types of elk habitat including winter range, summer range and production areas (CDOW-NDIS 2004). Elk summer range is defined as that part of the range of a species where 90% of the individuals are located between spring green-up and the first heavy snowfall, or during a specific period of summer as defined for each DAU. Summer range is not necessarily exclusive of winter range; in some areas winter range and summer range may overlap. Production areas are defined as that part of the overall range of elk occupied by the females from May 15 to June 15 for calving. The limiting factor for elk on the GMNF is winter range. Only a small portion of the total winter range for elk is located on National Forest System land. Critical winter range is at lower elevations on BLM and private land. Cooperative vegetation treatment activities with the DOW and Rocky Mountain Elk Foundation for habitat improvement include prescribed burning in oak types, mechanical treatments of pinyon-juniper habitats, and aspen regeneration.

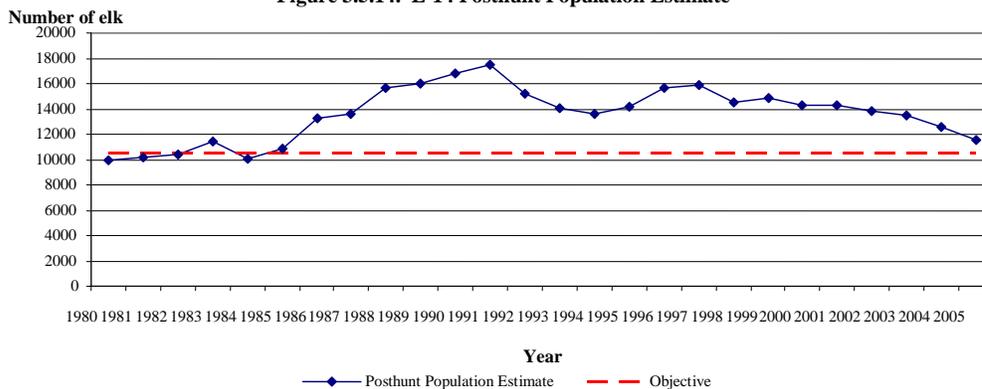
Because of the current lack of winter range, the Grand Mesa National Forest does not foresee a significant increase in big game populations. Habitat improvement through vegetation treatments described above would partially off-set habitat loss occurring on private land due to changing land uses such as subdivision, fencing, orchards, and oil and gas development. However, as land uses on private land are not under the jurisdiction of the federal or state agencies, the potential for increasing or improving winter range on the GMNF is limited.

Like most ungulate species, elk are gregarious and remain in herds throughout most of the year. Summer herds are generally found near or above timberline. Demographics of summer herds consist of cows, calves, and spike bulls. Mature bulls generally spend the summers in groups of three to four.

Calving occurs in late May or early June. Calving success is highly dependent on the severity of the winter and habitat conditions. If critical forage is non-existent or covered by unusually deep snow, pregnant cows may spontaneously abort. If carried to term, calves are often born underweight and have low survival rates compared to calves born to cows that were better nourished throughout the winter months (Fitzgerald et. al. 1994).

Elk populations in the area are intensively monitored by the CDOW. Annual harvest and census data are used to estimate elk populations within DAUs. According to the CDOW’s big game population statistics, the elk population on the Grand Mesa was approximately 11,500 in 2005, slightly above the stated population objective of 9,000-11,000 (CDOW 2006) These numbers are based on the Grand Mesa Elk DAU 14, in Game Management Units 41, 411, 42, 421, 52, and 521, which includes the Battlements, Muddy Creek country, and both sides of the Grand Mesa. According to the 2005 GMUG MIS assessment (USFS 2005a), the elk population on the GMUG is at or above population objective levels in most areas analyzed in the Forest. The bull: cow ratio in 2005 was observed to be 21.3 bulls to 100 cows. This is in line with the recommended 20-25 bulls to 100 cows ratio in the 2006 DAU E-14 plan.

Figure 3.5.14. E-14 Posthunt Population Estimate



The GMUG National Forest contains at least a portion of 11 DAU’s. Population estimates for these DAU’s (DAU 51 estimates were not available) in 2003 totaled 154,290 animals. This represents an increase of approximately 16,830 over the 2002 estimates. Population estimates are available for these DAU’s (except DAU 51) since 1980 and totals for all DAU’s are presented below.

See GMUG’s 2005 MIS assessment for more details on forest wide elk population trends. (USFS 2005a)

3.5.15 Environmental Effects Rocky Mountain Elk No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. Cross-country mechanized travel may have short-term effects on elk use of the analysis area as a result disturbance but it would not affect elk population trends at the local or Forest-wide scale. Even with cross-country mechanized travel occurring, elk populations are higher than objective levels.

3.5.16 Environmental Effects Rocky Mountain Elk All Action Alternatives

The proposed action or alternatives would not affect the amount or distribution of elk habitats. Existing mountain bike use is not restricted to designated routes and trails, therefore any of the action alternatives may result in less displacement of elk than may currently be occurring. The designation of new routes in the ski pods may result in a small amount of new displacement of elk use during the summer. However, elk summer habitat is not limiting to

elk populations. The objectives, standards and guidelines for elk in the Forest Plan would be met.

The proposed action and alternatives may have short-term effects on elk use of the Analysis Area as a result of changes in summer distribution, but it will not affect elk population trends at the local or Forest-wide scale.

3.5.17 Cumulative Effects Rocky Mountain Elk

Numerous land use actions (e.g., oil and gas activity, recreational activity, road building, housing development, etc.) on State and private lands surrounding the Grand Mesa National Forest are reasonably certain to occur over the next several years. Where these activities fall within mature aspen, these land uses have the potential to affect elk through loss or degradation of summer range and production area habitat, direct mortality during construction activities, and/or displacement from habitats.

3.5.18 Affected Environment Northern Goshawk

The northern goshawk is an uncommon resident in the foothills and mountains of Colorado (CDOW-NDIS 2003). Common goshawk breeding habitat characteristics include mature forest conditions of relatively high canopy closure, high density of large trees and snags, large downed woody debris, and small (less than 2 acres) openings in the forest canopy. On the GMUG National Forests, goshawk nest sites are usually located in mature forest stands with a component of aspen, in close proximity to water, often on northerly aspects in a drainage or canyon, and on localized site slopes of generally less than 10% (Harrison 1979, Hoover and Wills 1984, Reynolds et al. 1992, USFS 1991b, Kennedy 2003). Nests are often used more than one year, with some used intermittently for decades. As many as two to four alternate nest sites may be used in alternative years by goshawk pairs within their home range (Crocker-Bedford 1990, Reynolds 1983). The nest sites commonly are located within 0.5 mile of each other and are sometimes within the same forest stand (USFS 2005a).

According to the GMUG MIS Assessment for the Northern Goshawk (USFS 2005a), there are 700,000 acres of suitable goshawk habitat in aspen forest types. Because the northern goshawk is known to nest and forage in forest types other than aspen, other forested areas are also considered suitable goshawk habitat. However, the species' preferred habitat occurs in mature aspen woodlands.

Fierce hunters, goshawks hunt for small birds and mammals from perches in the lower forest canopy. They attack suddenly, at tremendous speed, over short distances. The goshawk is a top-level predator in the food chain, preying on a wide variety of bird and small mammal species. Prey species include rabbits, squirrels, chipmunks, grouse, woodpeckers, jays, robins, grosbeaks, and more (DeGraaf et al. 1991, Hoover and Wills 1984, Reynolds et al. 1992). Prey availability is most likely affected by forest type, forest condition, and climatic factors (as influenced by latitude and time of year).

Population Analysis

Records of known goshawk nest activity on the GMUG National Forests show that numbers of breeding goshawks and nest success (the young have fledged) have remained relatively stable, but low over a 17-year period (USFS 2005a). Although the records show that the vast

majority of known goshawk territories have been inactive in any given year, a strong caution must be used when calling a territory inactive when not all of the alternate nest sites are known. When only a single nest or two nests are known in a breeding territory (which is more common than not on the GMUG), it is highly likely that there are alternate nests in unknown locations within the same territory and one of these nests may be active. Even if an active nest is not located, when there is evidence (e.g., visual observations, calls) of an adult goshawk in the territory during the breeding season (March 1 – September 30), the Forest Service's assumption is that the territory is active (Reynolds et al. 1992).

The Forest Service completes northern goshawk nest surveys throughout portions of the GMUG on a yearly basis. Monitoring since 1984 has also shown that there are more than 10 goshawk pairs that have been successfully surviving and reproducing on the GMUG National Forests. In 2003 GMUG surveys, a total of 50 nests were observed, with only three identified as occupied and one probable (USFS 2004).

Forest Plan standards and guidelines for goshawk:

Managing for habitat needs of indicator species:

- (e) Goshawk (mature aspen): Provide 20% of pole or mature tree stands adjacent to nesting sites with at least 150 square feet of basal area. Provide at least one class 1 log adjacent to nesting sites.
- (k) [Goshawk]: In areas of historic shortage of dry season water, where there is less than one source per section, create one source per section.
- Maintaining habitat for viable population of all existing vertebrate wildlife species:
- Maintain habitat capability at a level at least 40% of potential capability. (This standard and guideline varies with specific Management Area direction).
- No activities shall be allowed within one quarter mile of an active Ferruginous hawk, Swainson's hawk, goshawk, osprey or prairie falcon nest from March 1 to July 31 if they would cause nesting failure or abandonment.

3.5.19 Environmental Effects Northern Goshawk No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. Northern Goshawk numbers of breeding goshawks and nest success have remained relatively stable, but low over a 17-year period (USFS 2005a) despite the increase in mechanized use. The trend is expected to continue under this alternative.

3.5.20 Environmental Effects Northern Goshawk All Action Alternatives

Proposed Action would not have any effects on goshawks, as it would only designate currently existing roads or trails. Alternatives 2 and 3 allow for an increase of routes within two of the Nordic ski areas. Some of these routes may impact areas of spruce-fir that are generally not being used by mountain bikes during the summer, even though they are well-used in the winter by skiers. Some of the winter routes would have to be relocated to avoid wetlands, which would likely require removal of aspen and spruce or fir trees. These routes would be looked at more specifically before designating them, and the NEPA analysis updated.

The proposed project would not have any new impacts to goshawks. Alternatives 2 and 3 may have short-term effects on goshawk use of the Analysis Area as a result of changes in vegetation, but it would not affect goshawk population trends at the local or Forest-wide scale. The Forest Plan objectives, standards and guidelines for goshawk would be met.

3.5.21 Cumulative Effects Northern Goshawk

Numerous land use actions (e.g., oil and gas activity, recreational activity, livestock grazing, road building, housing development, etc.) on State and private lands surrounding the Grand Mesa National Forest are reasonably certain to occur over the next several years. Where these activities fall within mature aspen, spruce-fir, or lodgepole pine habitats, these land uses have the potential to affect the goshawk through loss or degradation of breeding, foraging, and nesting habitat, direct mortality during construction activities, and/or displacement from habitats.

3.5.22 Affected Environment Spruce-Fir Dependent MIS

At higher elevations, the vegetation community in the Analysis Area is comprised of spruce-fir woodlands. This community is dominated by Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*), with aspen intermixed throughout. Understory species within this community include blueberry (*Vaccinium sp.*), bearberry (*Arctostaphylos uva-ursi*), geranium (*Pelargonium hortorum*), shrubby cinquefoil (*Potentilla fruticosa*), peachleaf willow (*Salix amygdaloides*), skyrocket (*Ipomopsis aggregate*), arrowleaf senecio (*Senecio angularis*) and goldenrod (*Solidago sp.*). According to the GMUG Forest Plan, spruce-fir dominates 749,397 acres in the Forest or roughly 25 percent of the total area (2,953,186 acres) (USFS 1991a). Of these 749,397 acres, 167,827 acres of spruce-fir woodlands are within the GMNF (5.6 % of GMUG).

3.5.23 Affected Environment American Marten

Habitat Analysis

The American marten is the most arboreal of all the weasel species. With semi-retractile claws and hind limbs that rotate, the marten is able to descend trees headfirst (Fitzgerald et al. 1994). The marten occurs in spruce-fir and lodgepole pine forests, alpine tundra, and occasionally in montane forests (Yeager and Remington 1956). The species is an opportunistic feeder, preying upon voles, mice, chipmunks, ground squirrels, snowshoe hares, cottontails, pikas, shrews, ruffed grouse, insects, fruits, nuts, berries, and carrion (Fitzgerald et al. 1994). The marten nests in hollow trees or squirrel nests and is solitary by nature (Fitzgerald et al. 1994).

Habitat requirements specific to the American marten include resting sites, dens, subnivean access areas, and logs and trees in various stages of decay (USFS 2005a). The best habitat in GMUG National Forests for the American marten is dense, contiguous stands of mature spruce-fir habitat. According to data collected in 1988, spruce-fir has the highest percentage cover (i.e. 33%) of any vegetative type within the GMUG Forests.

Dens can be on or under the ground, in tree roots, hollow logs, rock piles or under the snow. American marten also use squirrel nests and cavities in large trees. Daytime resting sites are generally off the ground except during incumbent winter weather when they are subnivean

(Strickland et al. 1982). Buskirk et al. (1989) reported fidelity among adult marten to subnivean and above ground resting sites.

American marten home ranges vary in geographic size depending on the availability of food, local marten population levels, and the amount of suitable woody debris within interior forest stands. Home ranges are thought to be exclusive within the sexes with some overlap, except during the breeding period. Marten adjust their movements in response to prey but do not migrate in elevation or by season.

Population Analysis

In Colorado, there is little information available on current or past marten populations. An apparent increase of martens occurred in the early 1950s (Yeager and Remington 1956), however other than harvest records, detailed population information since the 1950s is lacking.

Hoover and Wills (1984) estimated the minimum viable population and habitat area for marten to be ten adults, requiring 4,000 acres of habitat (290 acres feeding and 110 acres cover per adult marten) present prior to breeding season (USFS 2005a). This is based on an average home range size of one square mile per adult male marten. These assumptions have not been verified by State research to date (USFS 2005a).

Weckwirth and Hawley (1962) described indicators of population decline as: 1) a loss of female marten in the resident (local) populations, 2) a reduction in reproductive success, and 3) a failure of juvenile marten to remain in the area. Populations within a given area can fluctuate widely because of variation in reproductive success and resident mortality as well as large numbers of highly mobile transient individuals (Fitzgerald et al. 1994).

A number of marten studies investigating the effects of disturbances like timber harvesting, fuel-wood reduction, livestock grazing, and fire, show that the effects generally depend on the intensity, extent, and duration of the disturbance (USFS 2005a).

3.5.24 Environmental Effects American Marten No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. Where mechanized use becomes concentrated, displacement of marten may occur. These isolated effects would not result in negative effects to marten individuals or populations. The Forest Plan objectives, standards and guidelines for marten would be met.

3.5.25 Environmental Effects American Marten All Action Alternatives

Limited indirect effects may result in displacement of marten due to heavy human use. Occasional human use would not likely displace them, as they are naturally curious animals. These isolated effects would not result in negative effects to marten individuals or populations. The Forest Plan objectives, standards and guidelines for marten would be met.

3.5.26 Cumulative Effects American Marten

Numerous land use actions (e.g., oil and gas activity, recreational activity, road building, housing development, etc.) on State and private lands surrounding the Grand Mesa National

Forest are reasonably certain to occur over the next several years. Where these activities fall within spruce-fir habitats, these land uses have the potential to affect the marten through loss or degradation of sheltering and hunting habitat.

3.5.27 Affected Environment Aquatic/Riparian Dependent MIS

Overall, water makes up a very small portion of the habitat on the GMUG National Forests. According to the Colorado River Cutthroat Trout GMUG MIS assessment (USFS 2005a) there are 3,508 miles of perennial streams and 6,205 miles of intermittent streams throughout the Forest. Inventory data have shown that at least 1,200 miles of these streams contain viable fish populations consisting primarily of brook, rainbow, and brown trout (USFS 1991a). There are 9,360 acres of lakes throughout the GMUG, At higher elevations throughout the Project Area, there are multiple lakes, reservoirs, and streams that provide suitable habitat for various species of fish. The water levels in the reservoirs found within the Project Area are drawn down for irrigation purposes, but many remain at sufficient levels to sustain fish populations throughout the year. Numerous intermittent and ephemeral streams running through the Project Area do not support fish populations, but do carry run-off to more substantial waterways.

3.5.28 Affected Environment Colorado River Cutthroat Trout

Habitat Analysis

The Colorado River cutthroat trout (CRCT) has four major life history stages: spawning, egg incubation period, summer rearing, and winter rearing. Spawning occurs in late spring to mid-summer and depends primarily on water temperatures. During the late spring and early summer CRCT are generally widely dispersed and mainly interested in feeding (USFS 2001i). Additionally, most CRCT that reside in headwater streams do not migrate substantial distances to seek suitable spawning areas. Therefore, localized disturbances can greatly affect reproduction success where suitable spawning grounds are limited.

Numerous perennial streams and lakes occur in the Analysis Area. Three reservoirs and one stream within the Analysis Area are managed as a conservation population for Colorado River cutthroat: Hunter Reservoir, Youngs Creek Reservoirs #2 and #3, and Big Creek. Several other creeks within the Analysis Area are occupied by cutthroats, but have not been genetically tested for purity, and their status is unknown. These creeks are “potential” conservation populations.

Population Analysis

Cutthroat trout distribution and abundance has decreased significantly in Colorado. Since CRCT are limited to cold headwater streams, nearly all streams within the Forest are within the historic range of the CRCT, and as a result, are seen as potential recovery sites for the species (USFS 2005a). A recent assessment of CRCT populations states that CRCT occupy approximately 14% of historical range (Hirsch et al. 2006). Literature has identified the strongest cause of CRCT population decline comes from interactions with non-native trout (Young 1995, Behnke 1992). This interaction has led to competition, as well as hybridization of CRCT with other trout species, and local populations of “conservation”, or genetically pure CRCT, are rare in the GMUG (USFS 2005a). In addition to competition and hybridization, land management practices such as road construction, mining, recreation, and

water use have all been shown to have adverse effects on CRCT habitat conditions and abundance (Meehan 1994).

Currently there are 32 conservation populations of Colorado River cutthroat trout (CRCT) known to occur in 22 7th field watersheds on the GMUG. Two additional populations occur on BLM land adjacent to the GMUG Forest. Conservation Populations are restricted to approximately 96 miles of stream, with most populations occurring in tributaries of the North Fork of the Gunnison River. Streams on the GMUG support 27% of the known CRCT Conservation Populations in the Colorado, Dolores and Gunnison Geographic Management Units (GMUs). Existing populations are located in isolated headwater streams of generally 2-4 miles in length, and remain at risk for localized extirpations. Two CRCT Conservation Populations have been established in lakes totaling approximately 75 surface acres on the Grand Mesa; however, severe drought and dam reconstruction have likely affected the abundance of these populations. The total miles of stream occupied by CRCT on the Forest have increased 29% since 2001. However, this increase was largely due to the discovery of new CRCT Conservation Populations, and not from increases in abundance or dispersal of individual populations.

3.5.29 Environmental Effects Colorado River Cutthroat Trout No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. Localized disturbances can greatly affect reproduction success if mechanized travel occurs in limited, suitable spawning grounds. Sedimentation can occur from mechanized travel in and near occupied reaches which may negatively impact individuals. Continued cross-country mechanized travel is not likely to negatively affect CRCT population trends at the local or Forest-wide scale.

3.5.30 Environmental Effects Colorado River Cutthroat Trout All Action Alternatives

Due to their restrictive habitat, CRCT have short home ranges and therefore, even a small impact to available habitat could have an effect on local populations (Heggenes et al. 1991, Quinlan 1980). Mountain biking can increase sediment load into surrounding streams, creeks, and lakes, thereby degrading available habitat and impacting existing populations. Alternative 1 (Proposed Action) would actually result in less sedimentation of aquatic habitats, due to the restriction of mountain bike travel to designated roads and trails. Alternatives 2 and 3 may result in some new sedimentation of any routes designated in the Nordic ski pods, but also would reduce sedimentation by not allowing cross country travel. Under any alternative, riparian and aquatic habitats would be maintained as required by the Forest Plan and Watershed Conservation Plan, as well as the overall restriction of mechanized travel to designated roads and trails. The Proposed Action may result in beneficial effects to riparian and aquatic compared to current conditions.

The proposed action would not have any additional impacts above what is already occurring. Alternatives 2 and 3 may have impacts on CRCT due to the potential for increased sedimentation in the newly designated summer routes (ski pods), but it would not negatively affect CRCT population trends at the local or Forest-wide scale.

3.5.31 Cumulative Effects Colorado River Cutthroat Trout

Numerous land use actions (e.g., oil and gas activity, recreational activity, livestock grazing, road building, housing development, etc.) on State and private lands surrounding the Grand Mesa National Forest are reasonably certain to occur over the next several years. Colorado River cutthroat trout habitat could be directly affected through possible habitat degradation and loss, adding to the cumulative effects of potential habitat degradation occurring throughout the Forest.

3.5.32 Affected Environment Rainbow Trout

Habitat Analysis

Rainbow trout inhabit small to large rivers, creeks, cold headwaters, and lakes throughout Colorado. Prime rainbow trout habitats include clean, clear and cold waters with suitable structure, such as riparian vegetation, in-stream wood and boulders, and bank structure, for hiding and foraging areas (USDA-NRCS 2000). Rainbow trout are opportunistic feeders, relying heavily on aquatic invertebrates and terrestrial insects as well as smaller fish or fish eggs. Rainbow trout generally spawn in the spring and early summer in stream riffles downstream of pools. Rainbow trout, unlike the Colorado River Cutthroat, utilize a large area of stream habitat and often move long distances to spawn and feed (USDA-NRCS 2000). Rainbow trout habitat is widespread throughout the GMUG.

Population Analysis

Rainbow trout inhabit all available areas of stream and lake habitat on the GMUG (USFS 1991a), including the Analysis Area. Rainbow trout, along with other trout species, are regularly restocked in all lakes and streams above 9,000 feet and are the primary species stocked below 9,000 feet (USFS 1991a).

3.5.33 Environmental Effects Rainbow Trout No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. Sedimentation can occur from mechanized travel in and near occupied reaches which may negatively impact individuals. Continued cross-country mechanized travel is not likely to negatively affect Rainbow Trout population trends at the local or Forest-wide scale especially due to regular restocking of streams and lakes.

3.5.34 Environmental Effects Rainbow Trout All Action Alternatives

Perennial streams and lakes in the Analysis Area provide suitable rainbow trout habitat. Mountain biking can increase sediment load into surrounding streams, creeks, and lakes, thereby degrading available habitat and impacting existing populations. Alternative 1 (Proposed Action) would actually result in less sedimentation of aquatic habitats, due to the restriction of mountain bike travel to designated roads and trails. Alternatives 2 and 3 may result in some new sedimentation of any routes designated in the Nordic ski pods, but also would reduce sedimentation by not allowing cross country travel. Under any alternative, riparian and aquatic habitats would be maintained as required by the Forest Plan and Watershed Conservation Plan, as well as the overall restriction of mechanized travel to

designated roads and trails. The Proposed Action may result in beneficial effects to riparian and aquatic compared to current conditions.

The proposed action would not have any additional impacts above what is already occurring. Alternatives 2 and 3 may have impacts on rainbow trout due to the potential for increased sedimentation in the newly designated summer routes (ski pods), but it would not negatively affect Rainbow trout population trends at the local or Forest-wide scale.

3.5.35 Cumulative Effects Rainbow Trout

Numerous land use actions (e.g., oil and gas activity, recreational activity, livestock grazing, road building, housing development, etc.) on State and private lands surrounding the Grand Mesa National Forest are reasonably certain to occur over the next several years. Rainbow trout habitat could be directly affected through possible habitat degradation and loss, adding to the cumulative effects of habitat degradation and loss throughout the Forest.

3.5.36 Affected Environment Brown Trout

Habitat Analysis

Brown trout occur from southern Canada to the northeastern United States, and throughout the Appalachians and the Mississippi Valley. This species is also found throughout the western United States at higher elevations. Brown trout occur in a variety of habitats from small streams to large lakes. They require a year-round supply of cold, well-oxygenated water. Spawning in this species typically occurs on gravel bars from late October through November. Brown trout consume a variety of aquatic insects and other invertebrates, as well as fish, crayfish and a wide variety of terrestrial insects, such as ants, beetles, gnats, caterpillars, and inch worms. Brown trout habitat is widespread throughout the GMUG.

Population Analysis

Brown trout inhabit all available areas of stream and lake habitat on the GMUG (USFS 1991a), including the Analysis Area. Brown trout, along with other trout species, are regularly restocked in all lakes and streams above 9,000 feet and are the primary species stocked below 9,000 feet (USFS 1991a).

3.5.37 Environmental Effects Brown Trout No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. Sedimentation can occur from mechanized travel in and near occupied reaches which may negatively impact individuals. Continued cross-country mechanized travel is not likely to negatively affect Brown Trout population trends at the local or Forest-wide scale especially due to regular restocking of streams and lakes.

3.5.38 Environmental Effects Brown Trout Proposed All Action Alternatives

Perennial streams and lakes in the Project Area provide suitable brown trout habitat. Mountain biking near existing streams and lakes could result in sediments being carried to these habitats. If habitat is depleted, existing populations of brown trout could decline and fewer areas would be available for stocking. The proposed project may have short-term

effects on brown trout due to the potential for temporary increased sedimentation, but it would not negatively affect trout population trends at the local or Forest-wide scale.

The proposed action would not have any additional impacts above what is already occurring. Alternatives 2 and 3 may have impacts on brown trout due to the potential for increased sedimentation in the newly designated summer routes (ski pods), but it would not negatively affect brown trout population trends at the local or Forest-wide scale.

3.5.39 Cumulative Effects Brown Trout

Numerous land use actions (e.g., oil and gas activity, recreational activity, livestock grazing, road building, housing development, etc.) on State and private lands surrounding the Grand Mesa National Forest are reasonably certain to occur over the next several years. Brown trout habitat could be directly affected through possible habitat loss, adding to the cumulative effect of habitat loss throughout the forest.

3.5.40 Affected Environment Brook Trout

Habitat Analysis

The brook trout is a sport fish native to the eastern United States and eastern Canada. The brook trout has become established in many of Colorado's cold higher-elevation lakes and streams.

Brook trout primarily eat invertebrates, including insects and zooplankton, but large individuals occasionally eat small fishes. The species spawns in the fall over gravel substrate in lakes and streams. Eggs hatch in about two months. In Utah, successful reproduction of brook trout can often lead to overcrowding, and consequently, a large number of stunted (small) individuals. The overcrowding problem can be exacerbated by low fishing pressure in the brook trout's high elevation habitat.

Population Analysis

Brook trout inhabit all available areas of stream and lake habitat on the GMUG (USFS 1991a), including the Spaulding Peak Project Area. Brook trout, along with other trout species, are regularly restocked in all lakes and streams above 9,000 feet (USFS 1991a).

3.5.41 Environmental Effects Brook Trout No Action Alternative

All existing activities as described in Section 3.0 would continue to occur. No mechanized travel restriction would be implemented. Sedimentation can occur from mechanized travel in and near occupied reaches which may negatively impact the species by degrading available habitat and impacting existing populations. Continued cross-country mechanized travel is not likely to negatively affect Brook Trout population trends at the local or Forest-wide scale especially due to regular restocking of streams and lakes.

3.5.42 Environmental Effects Brook Trout All Action Alternatives

Perennial streams and lakes in the Project Area provide suitable brook trout habitat. Mountain biking can increase sediment load into surrounding streams, creeks, and lakes, thereby degrading available habitat and impacting existing populations. Alternative 1

(Proposed Action) would actually result in less sedimentation of aquatic habitats, due to the restriction of mountain bike travel to designated roads and trails. Alternatives 2 and 3 may result in some new sedimentation of any routes designated in the Nordic ski pods, but also would reduce sedimentation by not allowing cross country travel. Under any alternative, riparian and aquatic habitats would be maintained as required by the Forest Plan and Watershed Conservation Plan, as well as the overall restriction of mechanized travel to designated roads and trails. The Proposed Action may result in beneficial effects to riparian and aquatic compared to current conditions.

The proposed action would not have any additional impacts above what is already occurring. Alternatives 2 and 3 may have impacts on brook trout due to the potential for increased sedimentation in the newly designated summer routes (ski pods), but it would not negatively affect brook trout population trends at the local or Forest-wide scale.

3.5.43 Cumulative Effects Brook Trout

Numerous land use actions (e.g., oil and gas activity, recreational activity, livestock grazing, road building, housing development, etc.) on State and private lands surrounding the Grand Mesa National Forest are reasonably certain to occur over the next several years. Brook trout habitat could be directly affected through possible habitat loss, adding to the cumulative effect of habitat loss throughout the forest.

3.6 Recreation

3.6.1 Affected Environment

“The *Grand Mesa Travel Management Plan, 1994* and *Grand Mesa Travel Management “100 Mile” 2002* decision, established a system of routes by which motorized travel was restricted to designated routes as appropriate for the type of use. Neither decision addressed or determined a need to restrict mechanized travel on specific routes across the Grand Mesa National Forest. Also, system trails are intended to provide a sustainable route less than 50” in width, designated for a specific type of travel or use. This standard exists for other trail users on the Grand Mesa National Forest. The 1994 Grand Mesa Travel Management Plan designated specific trails for motorized and non-motorized uses. This plan attempted to address those concerns most critical to trail usage at that time, with no consideration for the potential incidence of mountain bike travel across the Grand Mesa National Forest.

The more recent travel plan, *Uncompahgre Travel Management Plan, 2004*, did address new and increased mechanized (mountain bike) travel. The outcome resulted in the restriction of mechanized travel to a system of designated routes. Selection of any of the action alternatives would standardize travel regulations for mechanized travel across the GMUG.

In 1994, the *Grand Mesa Travel Plan* did not anticipate an increase in use and participation of mechanized (mountain bike) modes of travel. Recent increases in technology have created new recreation opportunities in areas that were previously inaccessible. “Downhill” or “free-ride” forms of mechanized travel are a relatively new use on the Grand Mesa National Forest. “Downhill” mountain bike use on the Grand Mesa National Forest has been increasing, particularly in Kannah Creek Basin area and other areas below the rim where steep slopes prevail. The initial observation of this type of downhill use and the associated user-created

routes was in 2003. Monitoring has indicated that grades used for this experience exceeded 22%. It was further concluded through monitoring of user-created routes and trails that downhill use and travel at higher speeds is eroding soils at an accelerated rate compared to other uses depending on various weather and terrain conditions. Thus, the need to review and update the current travel plans that previously remained silent on the issue of mechanized travel.

The development of the alternatives considered previous travel management decisions, management emphasis areas, and future opportunities available:

- Previous travel management NEPA decisions have encouraged all non-motorized users to stay on designated system routes. Designated system routes are those routes the Forest Service identifies, numbers, establishes a maintenance level (and therefore a fiscal obligation), and signs as a designated route; thereby encouraging use by the public.
- It was noted in the December 2003 decision that the following areas were considered for non-motorized recreational opportunities: Scales Lake area, Flowing Park and Indian Point, Flattops, Kannah Creek area and Griffiths/Bull Creek/West Bench areas.
- Certain areas of the Grand Mesa National Forest fill specialized recreation niches like Kannah Creek Basin which is a hub for primitive and semi-primitive non-motorized equestrian recreation opportunities. This is an area where different non-motorized management activities may conflict. The District desires to keep this particular recreation focus in the area and even produces brochures for this purpose.
- Forest Plan standards and guidelines were also considered for each alternative. Three recreation elements considered from the Forest Plan for each management area are as follows: Dispersed Recreation Management, Transportation System Management and Trail System Management / Construction / Reconstruction. Details can be found in the project file.

3.6.2 No Action Alternative Environmental Effects

The No Action Alternative does not add new mechanized routes to the summer trail system. This alternative is the existing condition and continues to allow mechanized travel to occur off-route or cross-country travel on the Grand Mesa National Forest. The “No Action” Alternative does not regulate mechanized travel on 346,555 acres of the Grand Mesa National Forest. The existing condition will be used as a baseline for comparing the effects of each action alternative. Five hundred fifty-six total miles of the system routes will remain open to mountain bike travel, which includes 306 trail miles and 250 road miles.

3.6.3 Environmental Effects Common to All Action Alternatives

Each action alternative restricts mechanized travel to designated routes on the Grand Mesa National Forest. Restricting travel to designated routes will reduce resource impacts associated with off-trail travel. The three alternatives differ in relation to future trails, preferred trail development locations, and/or seasonal restrictions necessary to manage mechanized (mountain bike) travel on the existing 306 trail miles and 250 road miles

proposed as open. The roads are all open to mechanized travel and will not be further discussed in the alternatives. No user-created downhill routes would be added under any of the action alternatives. It was determined that to incorporate, develop, and maintain these user-created trails into the trail system would pose difficulty in meeting Forest Service standard trail specifications and meeting LRMP standards and goals for resource protection.

Dispersed Recreation Management elements from the Forest Plan are within the standards prescribed for each management area. Transportation System Management elements from the Forest Plan would not be affected in management areas 2A, 2B, 3A, 6B, 7A and 10E and would be within the standards prescribed for management area 4B and 5A. Trail System Management/Construction/Reconstruction elements from the Forest Plan would not be affected in all management areas except for management area 2B which would be within the standards prescribed.

In general, the responses and comments received were favorable for the designation of specific routes for mountain bike travel. Also, various motorized user groups provided comments on the proposal.

Some comments were received that did not support the proposed action. In specific, two comments stated that a restriction for mechanized travel to designated routes posed either safety or potential trail conflicts between various user groups. Below are responses to each comment, summarized as “Mechanized Trail Experience” and “Trail User Safety.”

Mechanized Trail Experience

The 1994 *Grand Mesa Travel Management Decision* resulted in a designated system of routes that provided trail users with a travel hierarchy on each route. As previously discussed, with the exception of designating a few specific routes specific as “hiker only”, the 1994 travel plan focused on the designation of motorized use to specific routes. These routes were shown on maps and signed on the ground with the trail name, trail number and the designated use(s). Since the implementation of the 1994 travel plan, incidents of illegal trail use (travel on a route by a use that was not designated) have decreased each year.

If implemented, the proposed action to restrict mechanized travel on designated routes does not alter or add more restrictive rules to the affected routes (see alternative maps and tables). In addition, the proposed action enables a travel hierarchy to be used as a mitigation or education tool at trailheads, which may prevent potential trail user conflicts. Finally, an interested organization such as COPMOBA can play a large role in delivering an educational message to mechanized trail users in specific areas.

The action alternatives provide future trail development opportunities to further reduce potential conflicts on other system routes shared by various trail users.

Trail User Safety

In response to trail user safety, a potential does exist for trail safety concerns as the Grand Mesa continues to experience growth in mechanized (mountain bike) trail use. While it is difficult to anticipate future changes and advances in technology, it is anticipated that advances will be made that would allow a larger percentage of users to access routes and areas that have been fairly limited in the past. The case can be made in specific areas of the Grand Mesa, which primarily provides a non-motorized trail experience. The area of Kannah Creek Basin has high historical stock use and there are concerns that if mechanized use on

the trail system were to significantly increase, unsafe trail experiences specific to stock users may be created.

While the action alternatives vary based on the addition of routes and/or the implementation of seasonal restrictions, the designation of mechanized travel to specific routes will more clearly identify where the use will occur as well as where the use is not allowed. This designation will allow other trail users to fully understand where they may expect to encounter mountain bike travel and also where they may go to avoid this shared use.

Table 3.6.3. Trails by Alternative

Trail Number	Trail Name	Alt 1 Max Use	Alt 2 Max Use	Alt 3 Max Use	Miles	Comments
Grand Mesa– North						
501	West Bench	Mtn. Bike	Mtn. Bike	Mtn. Bike	5.5	
504	East Brush Creek	ATV	ATV	ATV	3.4	
506	Lake of the Woods	Mtn. Bike	Mtn. Bike	Mtn. Bike	5.22	
506.1A	Bull Creek Cutoff	Mtn. Bike	Mtn. Bike	Mtn. Bike	1.2	
507	Bull Basin	ATV	ATV	ATV	1.3	
508	Youngs	ATV	ATV	ATV	1.25	
509	Lily Lake	Mtn. Bike	Mtn. Bike	Mtn. Bike	0.8	
510	Carpenter	ATV	ATV	ATV	0.68	
511	Crum Reservoir	ATV	ATV	ATV	3.42	
512	Bonham	ATV	ATV	ATV	3.6	
513	West Salt Creek	ATV	ATV	ATV	0.87	
514	Salt Creek	ATV	ATV	ATV	6.75	
515	High	ATV	ATV	ATV	8.57	
516	Beaver	ATV	ATV	ATV	3.25	
517	Silver Spruce	ATV	ATV	ATV	10.4	
518	Monument	ATV	ATV	ATV	13.31	
519	Buzzard Park	ATV	ATV	ATV	5.06	
520	Power Line	ATV	ATV	ATV	4.15	
521	Two Peak	ATV	ATV	ATV	4.3	
522	Burn	ATV	ATV	ATV	4.22	
523	Divide	ATV	ATV	ATV	0.96	
524	Hightower	ATV	ATV	ATV	3.02	
525	Boundary	ATV	ATV	ATV	7.24	
526	Boundary Cutoff	ATV	ATV	ATV	2	
527	Battlement	ATV	ATV	ATV	20.3	Mud Hill to Kimball Creek

Trail Number	Name	Alt 1 Max Use	Alt 2 Max Use	Alt 3 Max Use	Miles	Comments
527	Battlement	Mtn. Bike	Mtn. Bike	Mtn. Bike	0.5	Kimball to WRNF (closed to mech. On WRNF)
529	Brush Creek	ATV	ATV	ATV	3.75	
530	Hawxhurst	ATV	ATV	ATV	3.5	
531	Smalley Mountain	ATV	ATV	ATV	4.31	
532	Kimball Creek	ATV	ATV	ATV	4.43	
533	Raven	Mtn. Bike	Mtn. Bike	Mtn. Bike	0.5	Closed to mechanized on WRNF
534	Porter	ATV	ATV	ATV	3.23	
535	Porter Cutoff	ATV	ATV	ATV	1.92	
536	Buzzard	ATV	ATV	ATV	2.47	
539	Owens Loop	ATV	ATV	ATV	3.57	
					Total miles =	147.02
Grand Mesa - South						
700	Whitewater Basin	Mtn. Bike	Mtn. Bike	Mtn. Bike	3.75	
702	Coal Creek	Mtn. Bike	Mtn. Bike	* Mtn. Bike	9.01	* = Seasonal Restriction 10/1 - 11/30
703	Coal Creek Basin	Mtn. Bike	Mtn. Bike	* Mtn. Bike	4.67	* = Seasonal Restriction 10/1 - 11/30
705	Switchback	Mtn. Bike	Mtn. Bike	* Mtn. Bike	0.91	* = Seasonal Restriction 10/1 - 11/30
706	Kannah Creek	Mtn. Bike	Mtn. Bike	* Mtn. Bike	8.75	* = Seasonal Restriction 10/1 - 11/30
707	Spring Camp	Mtn. Bike	Mtn. Bike	* Mtn. Bike	7.72	* = Seasonal Restriction 10/1 - 11/30
707.1A	Blue Lake	Mtn. Bike	Mtn. Bike	* Mtn. Bike	0.82	* = Seasonal Restriction 10/1 - 11/30
708	Indian Point Cutoff	Mtn. Bike	Mtn. Bike	* Mtn. Bike	2.1	* = Seasonal Restriction 10/1 - 11/30
709	Deep Creek (TR 501 to RD 100)	Mtn. Bike	Mtn. Bike	Mtn. Bike	6.01	
709	Deep Creek (Rd 100 to TR 702)	Mtn. Bike	Mtn. Bike	* Mtn. Bike	1	* = Seasonal Restriction 10/1 - 11/30

Trail Number	Trail Name	Alt 1 Max Use	Alt 2 Max Use	Alt 3 Max Use	Miles	Comments
709.1A	Deep Creek Cutoff	Hiker	Hiker	Hiker	0.66	
710	Currant Creek	Mtn. Bike	Mtn. Bike	Mtn. Bike	4.3	
711	Crag Crest (West TH to TR 712)	Mtn. Bike	Mtn. Bike	Mtn. Bike	1.5	National Recreation Trail
711	Crag Crest (TR 712 to East TH)	Hiker	Hiker	Hiker	5.13	National Recreation Trail (crest portion)
711.1A	Crag Crest Loop	Mtn. Bike	Mtn. Bike	Mtn. Bike	3.56	National Recreation Trail
712	Cottonwood	Mtn. Bike	Mtn. Bike	Mtn. Bike	1.78	
713	Land O' Lakes	Hiker	Hiker	Hiker	0.22	Paved Interp Trail
715	Indian Point (Rd 109 to Indian Pt)	Mtn. Bike	Mtn. Bike	Mtn. Bike	4	
715	Indian Point (Indian Pt to FBDY)	Mtn. Bike	Mtn. Bike	* Mtn. Bike	5	* = Seasonal Restriction 10/1 - 11/30
716	Sissy	Mtn. Bike	Mtn. Bike	Mtn. Bike	0.3	
717	Leon Lake	Mtn. Bike	Mtn. Bike	Mtn. Bike	1.8	
718	Cedar Mesa	ATV	ATV	ATV	3.15	
719	Green Mountain	ATV	ATV	ATV	15.51	
720	Elk Park	ATV	ATV	ATV	2.29	
721	Greenwood	ATV	ATV	ATV	2.4	
722	Blue Grouse	Mtn. Bike	Mtn. Bike	Mtn. Bike	4.9	
724	Bull and Brown	ATV	ATV	ATV	1.59	
725	Point Camp	Motorcycle	Motorcycle	Motorcycle	3.3	
726	Drop Off	Motorcycle	Motorcycle	Motorcycle	2.31	
727	Farmers	Mtn. Bike	Mtn. Bike	* Mtn. Bike	1.4	* = Seasonal Restriction 10/1 - 11/30
728	Carson Lake	Mtn. Bike	Mtn. Bike	Mtn. Bike	1	
729	Hay Park	ATV	ATV	ATV	1.8	
730	East Leon	ATV	ATV	ATV	9.33	
731	Last Chance	ATV	ATV	ATV	1.4	
732	Ella	ATV	ATV	ATV	2.2	
733	Reynolds	ATV	ATV	ATV	1.9	
734	Eureka	ATV	ATV	ATV	3.6	
734.1A	Eureka Cutoff	ATV	ATV	ATV	0.37	
736	Triangle Stomp	ATV	ATV	ATV	1.7	
743	Trout Lake	ATV	ATV	ATV	1.12	

Trail Number	Name	Alt 1 Max Use	Alt 2 Max Use	Alt 3 Max Use	Miles	Comments
744	Ward Lake	Hiker	Hiker	Hiker	1.25	Ward Lake Rec Area (Campground) System
745	Grand Mesa Discovery	Hiker	Hiker	Hiker	0.3	Interp Trail out of GM Visitor Center
746	Cobbett to Ward	Hiker	Hiker	Hiker	0.3	Ward Lake Rec Area (Campground) System
746.1	Twilight Spur	Hiker	Hiker	Hiker	0.1	Ward Lake Rec Area (Campground) System
747	Cobbett Lake	Hiker	Hiker	Hiker	0.7	Ward Lake Rec Area (Campground) System
748	Island Lake	Hiker	Hiker	Hiker	1.68	Ward Lake Rec Area (Campground) System
749	Crag to Cobbett	Hiker	Hiker	Hiker	1.1	Ward Lake Rec Area (Campground) System
751	Baron Lake	Hiker	Hiker	Hiker	1.43	Ward Lake Rec Area (Campground) System
752	Scotland	ATV	ATV	ATV	2.36	
753	Aqueduct	ATV	ATV	ATV	2.5	
754	Skimmed Milk	ATV	ATV	ATV	0.8	
755	Willow	Mtn. Bike	Mtn. Bike	Mtn. Bike	1.49	
TBD	Flowing Park Loop	Mtn. Bike	Mtn. Bike	Mtn. Bike	10	Constructed from 2004 - 2008
Total miles =					158.27	
Fruita Division						
646	Ridge	ATV	ATV	ATV	4.15	
647	Black Pine	Mtn. Bike	Mtn. Bike	Mtn. Bike	2.1	
648	Little Dolores	ATV	ATV	ATV	1.57	
661	Turkey Flats	Mtn. Bike	Mtn. Bike	Mtn. Bike	2.88	
662	Haypress	Mtn. Bike	Mtn. Bike	Mtn. Bike	1.6	
663	Reservoir #1	Mtn. Bike	Mtn. Bike	Mtn. Bike	1.51	

Trail Number	Name	Alt 1 Max Use	Alt 2 Max Use	Alt 3 Max Use	Miles	Comments
					Total miles =	13.81
Potential New "Summer" Trail System Additions						
TBD	Extra Credit	Non-System	Non-System	Non-System	1.5	Existing Single Track Trail (used by Hikers & Mtn Bikes)
TBD	Mesa Creek	Non-System	Mtn. Bike	Mtn. Bike	3.5	Existing Single Track Trail (used by Hikers & Mtn Bikes)
Mesa Top to Flowing Park Area						
TBD	Mesa Top	Non-System	Mtn. Bike	Mtn. Bike	6	New construction of Single Track
TBD	Holland's Loop	Non-System	Mtn. Bike	Mtn. Bike	1	Conversion of logging road (non-system)
TBD	Crane Lake Loop	Non-System	Mtn. Bike	Mtn. Bike	3	Conversion of 2 track (non-system)
Scales Lake Area						
TBD	Scales Lake Connector	Non-System	Mtn. Bike	Mtn. Bike	1.98	Conversion of old logging road
TBD	Lion's Loop	Non-System	Mtn. Bike	Mtn. Bike	2.11	Conversion of old logging road
TBD	Timber Sale Loop	Non-System	Mtn. Bike	Mtn. Bike	3.05	Conversion of old logging road
TBD	1-2-3 Loop	Non-System	Mtn. Bike	Mtn. Bike	4.97	Conversion of old logging road
TBD	Dog Loop	Non-System	Mtn. Bike	Mtn. Bike	1	Conversion of old logging road
TBD	Mesa Top to Dog Loop	Non-System	Mtn. Bike	Mtn. Bike	0.3	New construction of Single Track
					Total miles =	28.41

3.6.4 Environmental Effects Proposed Action (Alternative 1)

This alternative was designed to complement and utilize the existing travel management decisions. This alternative proposes to adopt the current system of routes as identified in the 1994 and the 2003 amended Grand Mesa Travel Plan Decisions. The alternative deals only with the current situation (resource damage from cross-country travel) and does not plan for future recreational uses/demands and mechanized trail development. Other than the few routes already designated as "Hiker Only", the alternative also does not address the need to possibly impose seasonal restrictions on other non-motorized routes to avoid potential user

conflict. There are limited numbers of routes designed for non-motorized single-track opportunities offered in the current travel system.

Alternative 1 is less desirable than other action alternatives because it supports public use of the existing designated routes but does not address demand for additional mechanized trails nor does it allow the Forest Service to develop and/or manage areas for a range of non-motorized experiences in conjunction with existing management objectives and emphasis areas.

3.6.5 Environmental Effects Alternative 2

This alternative was designed to complement existing travel management decisions and offer areas for future mountain bike trail development. This alternative proposes to adopt the current system of routes, as identified in past Grand Mesa Travel Plan Decisions. This alternative addresses future uses and demands and does not recommend area specific seasonal restrictions (see Alternative #3). The alternative allows for additional trail developments for mechanized (mountain biker) users while restricting travel to designated routes to protect natural/cultural resources. The trails identified to be constructed and/or formally added into the trail system for mountain bike use coincides with established plans and management objectives (as previously described in Section 3.6.1).

This alternative recognizes mechanized (mountain bike) use on the Grand Mesa as a unique opportunity niche with a season specific to the summer months due to snow pack. This recreation opportunity compliments the abundant opportunities available on lower elevation public lands (BLM) available during the fall, winter and spring seasons and closer proximity to the urban communities of the Western Slope. In addition, the areas identified for additional trails (Scales Lake, Flowing Park, Mesa Top, etc.) have been previously identified to provide future mountain bike opportunities. These areas promote mechanized trails where use coexists with developed trailhead facilities which address resource concerns (i.e. sanitation, parking), are easily accessed off of Hwy 65 and are in areas where conflicts with other uses are minimal.

This alternative is based on consideration of the items above (Section 3.6.1) and with anticipated growth in recreation demand for mechanized use. Under this alternative, the “Scales Lake Complex” evolved as true opportunity for summer mechanized travel. The Scales Lake Complex includes old logging routes which have historically received use by hikers and some mountain bikers. Not all routes were considered sustainable due to other environmental concerns, primarily associated with wet areas. The Scales Lake Complex also includes loops of various length and difficulty which appeal to more diverse user groups such as families.

The “Flowing Park Area” is also considered for additional opportunity to connect existing and under-construction system mechanized routes to the Mesa Top trailhead to make use of existing facilities and create additional and sometimes more challenging loop opportunities.

The Mesa Creek trail (known as “Ambush” by some users) is an existing non-system route that has been historically popular with hikers recently with some mechanized users. It is a existing route that may become sustainable with minimal work such as adding drainage structures waterbars and the route meets the semi-challenging demands of some mechanized users.

Alternative 2 provides the largest number of system trail routes designated for mountain bike travel while also addressing the need to restrict mechanized travel to designated routes to reduce existing and future environmental impacts caused by off route travel.

3.6.6 Environmental Effects Alternative 3

Alternative 3 is similar to Alternative 2 except it contains a seasonal restriction in the Kannah Creek Basin. Alternative 3 was designed to complement existing travel management decisions, offer potential areas for future trail development, and to incorporate restrictions on certain routes/areas in anticipation of a continued increase of mountain bike use in areas where/when mechanized use may not be compatible with historical use or management objectives.

This alternative includes the development of new mountain bike trail systems in the Scales lake, Flowing Park and Mesa Top areas as well as the adoption of a trail along Mesa Creek. As previously discussed (Section 3.6.1), the addition of trail systems in these areas coincides with management goals in providing opportunities that best meet the needs of both the local communities and to the visiting public and have minimal potential for conflict with existing uses.

In addition to providing new trail systems for mechanized use on the top of the Mesa accessed directly off Highway 65, this alternative includes a seasonal restriction for mechanized use in Kannah Creek Basin during the fall (beginning October 1). Recreation management objectives for the area include providing a primitive non-motorized experience (back country) with an emphasis on equestrian use.

The lower to mid-elevation climate of the Kannah Creek Basin provides for a long season of use (March–November) with the heaviest use period occurring in conjunction with the fall big-game hunting seasons (September – mid November). A seasonal restriction during this high use period would meet historic management objectives, further correspond with the recreation emphasis assigned to the area, and address potential safety concerns where limited site distance, steep slopes and tight corners could result in conflicts between mountain bike and equestrian use. Since Kannah Creek is one of the first places on the Grand Mesa to become accessible, the basin receives a moderate amount of mechanized use during the spring. However, since access to the top of Kannah Creek is still limited due to snow during this time, the majority of recreation use occurs from the bottom of Kannah Creek; therefore, the inability to ride the trails downhill from the top further minimizes mechanized use and reduces potential conflict between downhill riders and equestrian users. Overall, recreation use in Kannah Creek Basin decreases during the middle of the summer due to relatively high temperatures which also minimizes potential conflict without the implementation of a restriction during this season.

This alternative would be the most restrictive of the action alternatives on approximately 23,000 acres in the Kannah Creek Basin through implementation of a fall season mechanized travel restriction affecting mechanized (mountain bike) use on the 34.0 trail miles within the basin. However, with the development of new trail systems for mountain bike use on top of Grand Mesa, this alternative would continue to meet the management goal of providing recreation emphasis areas for each type of non-motorized use.

3.6.7 Cumulative Effects

The historic uses of the area include: livestock grazing, water improvements, timber harvest, fire restoration, maintenance of irrigation ditches, tourism, and recreation (including hunting). For whichever alternative is selected the cumulative effects will be the same. As user numbers continue to increase, there will be a continued increase in demand for routes to meet specific user needs. Travel management decisions will be subject to review as conditions or user trends change over time. A periodic review may find future special orders or decisions are necessary to enable a seasonal closure or restriction to address future trail safety concerns due to growth in mechanized trail use.

3.7 Transportation System & Safety

3.7.1 Affected Environment

Currently mechanized travel is allowed throughout the analysis area on and off trail except where specifically prohibited such as hiker-only trails. Because of the nature of cross-country travel, there is no inventory beyond consideration of system, non-system and user-created routes that were identifiable on the ground. Essentially there is no management of mechanized travel and resource impacts that have begun to occur as a result of off route travel. Existing Land and Resource Management Plan (LRMP) goals/objectives are not being met by the lack of management, nor are the identified recreation goals and objectives being addressed. See other resource sections in this chapter for descriptions of impacts.

Motorized cross-country travel has been prohibited for many years on the Grand Mesa. Along with the motorized prohibition, it was recommended that all users stay on designated routes.

The routes designated “open” for travel by this mechanized travel analysis are considered part of the Forest transportation system and are managed and maintained by the Forest Service. Other routes may be present that are not part of the public transportation system such as administratively authorized routes for a single purpose (i.e. access to a private residence, irrigation ditch, etc.). Where this situation applies, the routes are managed by the Forest Service but normally maintained by the authorized user. Routes that have public rights-of-ways such as US or state highways or county roads are also National Forest System routes and will not change under any of the alternatives identified within this travel analysis.

Travel is generally categorized and managed based on the mode of travel. The Forest Service characterizes route travel by the following hierarchy of travel modes:

- Hiker,
- Horseback,
- Mountain bike (i.e. mechanized),
- Single-track motorized (i.e., motorcycle),
- OHV (i.e., all-terrain vehicle) less than or equal to 50 inches in width,
- Full-sized motorized vehicles (i.e., OHV’s greater than 50” wide, jeeps, etc) and
- Two wheel-drive passenger vehicles

These travel mode categories help the Forest Service develop transportation systems that provide for safety of the user and meet overall transportation and recreation objectives.

Travel modes relate to the type of travel routes available and imply certain design standards for grade, trail tread width, and clearing height, identifiable to the public as:

- Hiking trails,
- Hiker/Horse trails,
- Mountain bike trails,
- Motorcycle trails,
- ATV trails,
- Jeep Trails,
- High-clearance road /full-size vehicle road, and
- Roads designed for passenger vehicles.

On the Grand Mesa National Forest, trails that are open to motorized uses are open to all non-motorized uses. Also, routes that are open to mechanized uses are open to other non-motorized uses. Based on the above list if a route is designated open for a certain user group, the trail is often open to all uses listed above that use. There are approximately 15 miles of trails on the Grand Mesa designated and managed for a “hiker only” experience.

While travel for recreation and tourism has, in general, been increasing since the 1940s, recent Forest Service traffic counter numbers do not suggest a noticeable change in vehicle travel measured on passenger vehicle roads. While specific recreation use, such as mechanized use, may be increasing, over-all use of the Grand Mesa National Forest does not appear to be increasing during recent years.

No system routes are proposed for decommissioning. Route restrictions may be warranted to protect natural resources or to ensure compliance with existing laws or regulations. Rehabilitating non-system or user-created routes may also be required, as discovered. Routine management activities may be required to do these maintenance-like items to repair damage from unauthorized use. Rehabilitation may include the following activities in any combination:

- Installation of signs
- Block entrance (i.e., barricades)
- Revegetate (i.e., rip and seed)
- Restore natural drainage patterns (i.e., waterbars, outsloping)

Safety

Safety can be a concern where mixed-use (motorized, mechanized, and other non-motorized use occurs) on the forest. Differing speeds, especially where high speeds occur, pose the greatest danger. The biggest concerns regarding mixed-use occurs between when full-size vehicle traffic and OHV traffic occur on maintenance level 3 and above roads where speeds often exceed 30 mph. While the Grand Mesa has these challenges, there are also concerns with the mixing of mechanized use and other non-motorized uses particularly equestrian use. The current situation on the Grand Mesa includes this concern on the steep flanks of Grand Mesa (areas that make good downhill biking) where collisions or near-miss collisions may result in injuries to hiker, horses, their riders, and other mechanized users because of limited sight-distance, steep terrain, quiet nature of both types of uses, tight turns, and open cross-country travel for non-motorized users. While no specific reports have been recorded, comments received during scoping identified the concern for this type of situation.

Route Integrity

There are times where travel on routes, due to certain road and/or trail conditions, causes rutting, down cutting, or rough travel surfaces to persist. Sometimes these rough travel surfaces make travel for some modes of travel difficult or impossible.

Rough travel surfaces on trails are typically leveled out or smoothed out as a result of continued use and travel. Rarely do the agencies mechanically grade trails, but when trails receive maintenance it may include filling down-cut trails, armoring trail segments to prevent further down cutting or even re-alignment to provide a smoother travel surface.

Another aspect of route integrity involves situations where narrow trails designated for single track use are used by OHVs which have a wider track. Such use causes the trail to become wider and have a different travel surface. These changes can adversely affect the route integrity of the trail and make its use less desirable for originally designed purpose.

Sustainability, Maintenance and Funding Affected Environment

Sustainability of a transportation system is a balance of environmental effects versus fiscal considerations. While the minimum transportation system necessary to meet land and resource management plan goals may be the most cost-effective it does not effectively address 1) the social and recreational components and 2) the ever-increasing costs of maintenance of an existing transportation system including equipment, personnel, fuel costs, and enforcement. An additional consideration is whether the transportation network will be adaptable to meet future demands to ensure health of forests, continue multiple use management activities, and provide desirable recreation opportunities.

While the amount of appropriated dollars made available at the district level for trail maintenance have remained relatively flat or even decreased over the years, the Forest has had to rely more on partnerships with interested groups and grant funding to accomplish this work. As a result of programs such as the State OHV Registration program, funds available to conduct work on OHV routes has been somewhat available. However, funding opportunities for other types of trails have been more limited resulting in the need for increased participation from local user groups to help accomplish maintenance on their trails.

Enforcement/Signing

Public availability of maps, information and education coupled with signing or other physical barriers on the ground have been somewhat effective in preventing undesired entry on unauthorized routes or proliferation of routes. Enforcement of travel rules, through law enforcement actions, is effective but relies on Forest Service personnel being on the scene during the infraction or be able to receive enough information from witnesses for a violation to be issued. The most over-looked, but also the most effective, enforcement and educational tools are the self-policing of organized user-groups especially those willing to form partnerships with the agency.

Access

Access across private lands is an issue outside the scope of consideration for this travel analysis unless there is a legal mechanism in place such as a right-of-way. Those routes that enter public lands through private without a legal mechanism should not be considered as part of the public transportation system as access may be denied by the owner at any time.

However, historic prescriptive rights are being used to perpetuate continued access and; therefore, while access is not being restricted by this document, neither is it considered a part of the public system. If a legal instrument is in place, those routes have been considered public routes in this document.

Additionally, private property ownership should not afford or result in exclusive access to public land. These issues will continue to be analyzed and corrected outside of this public travel management process.

This analysis does not negate or infringe on any valid existing rights. FS regulation of any occupancy occurring under valid rights may be adjusted to a level consistent with the full protection and recognition of R.S. 2477, consistent with current applicable law and direction. Amendment or modification of this Travel Plan may be required as other rights are validated.

3.7.2. Environmental Consequences All Alternatives

General Transportation System

With increasing recreational use, problems identified by public land managers and the public continue to occur on public lands. New routes continue to be created by users; some existing routes continue to cause resource damage; some routes have adverse impacts on wildlife and wildlife habitat; and others result in conflicts among users. On the other hand, there are existing routes that provide high quality recreation opportunities with limited or negligible adverse impacts associated with their use.

There will continue to be a demand for quality experiences by all travelers regardless of the mode of travel. All action alternatives address to varying degrees quality of experience for recreation users. All user groups would like exclusivity of use; unfortunately, this is inconsistent with the hierarchy of uses where routes are open to all modes of travel below what is specified. For example an OHV trail is open to use by motorcycles, mountain bikes, horses and hikers. Some users may feel like their experience has been compromised; however, opportunities for recreational travel (whether it is on a motorized or non-motorized trail) exist in all alternatives.

All alternatives provide continued opportunity for mechanized users while at the same time represent a compromise between different user groups. The designated system of routes will also lead to more definitive interpretations of traffic data as patterns of use will emerge. Further, the Forest Service will be able to determine at what rate use is increasing to facilitate future mechanized travel opportunities.

Specific restrictions on routes may change slightly by alternative to protect resources, provide for a range of recreation experiences or to meet current regulations; these will not noticeably affect the network of routes.

Safety

The use of differing types of vehicles or modes of transportation on a particular route is referred to as “mixed-use”. In general, the higher the maintenance level, or user comfort level of the route, such as paved or improved roads that lend themselves to travel at higher speeds, the greater the likelihood and severity of accidents between different types of vehicles. Therefore, mixed-use is generally only recommended on non-paved public roads with lower traffic levels and slower speeds.

Due to restrictions or safety mitigations in place on some of the higher standard routes and due to the lower traffic levels and speeds on high-clearance routes the likelihood of mixed-use accidents occurring for all alternatives is low.

As minimal data exists for mechanized use, it is assumed that single purpose concerns would be consistent with motorized mixed-use scenarios for all alternatives where the higher the travel speed, the higher the greater the likelihood and severity of accidents.

Pertaining to mixed use of mechanized travel and other uses, a concern has been identified through this analysis regarding the mixing of mechanized use on high use equestrian trails. Specific concern has been identified within the Kannah Creek Basin area during the fall period due to the higher volume of equestrian use, limited sight-distance, steep terrain, quiet nature of both types of uses, and tight turns. Due to the restricting of mechanized travel to designated routes, Alternatives 1 and 2 would result in a slight increase mixing of mechanized and equestrian use on trails in the Kannah Creek Basin; but would reduce this possible conflict on user-created downhill routes which may be receiving some use by equestrian users or hikers. Although the mixing of such use in these areas are overall minimal, these occurrences are most likely associated with the non-system “downhill” routes located near the old Mesa Ski Hill area and the North side of Kannah Creek Basin.

In addition to restricting mechanized travel to designated routes, Alternative 3 includes a fall seasonal restriction to mechanized use throughout Kannah Creek Basin, including the existing trail system. This alternative provides more active measures to reduce potential conflicts in an area with a management emphasis for equestrian use and during its highest use season.

Route Integrity

All alternatives will continue to see route integrity as a concern as routes that fall within the travel hierarchy will see multiple types of use with the exception of the hiker-only trails which is the only exclusive-use due to safety concerns. This is an unavoidable consequence of having routes open to multiple users. The Alternatives have addressed this to the extent that where natural resource or recreation concerns exist; consideration has been given to whether or not the mode of transportation should be changed or restricted.

Fiscal Sustainability, Maintenance and Funding

Limited numbers of routes are able to be maintained in any given year due a variety of economic and resource factors. Appropriated funding will not keep up with the cost of funding needed maintenance of any system of travel routes that meets resource management or visitor use needs. Many miles of roads and trails are maintained through agreements with counties, user groups and other permitted users.

Occasionally the opportunity presents itself for either grant funding, user-group funding or volunteered hours for construction or maintenance of particular trail routes. However, this is not a consistent source of funding or labor from year to year. These opportunities have been and will continue to be most applicable to individual trails or trail systems and are, generally, spearheaded by organized groups working together with the Forest Service.

While often overlooked, fiscal costs are also incurred through the closing/rehabilitation of user-created routes. Appropriated funding will also not adequately cover this option if large numbers of routes need rehabilitation. This lack of funding is sometimes countered with

funding or agreements with conservation or wildlife groups (rarely user groups) that will work with the agencies to rehabilitate routes to restore wildlife habitats.

The alternatives from a fiscal sustainability stand point are hard to distinguish. After non-system user-created routes are rehabilitated, there will be more fiscal benefit to Alternative 1 which supports fewer route miles. Alternatives 2 and 3 which have higher miles of routes may require more funding (approximately 8% increase) for maintenance activities. All alternatives allow for flexibility in adapting to future needs through additional NEPA processes.

Enforcement/Signing

No changes to methods of travel management enforcement are expected with selection of any of the alternatives. User groups will be encouraged to continue working with the Forest Service to prevent proliferation of user-created trails. Very minor additional signing for any of the alternatives considered will be required to make on-the-ground designations compatible with approved travel management direction and decisions.

Access

As access to or from private lands is outside the public transportation system network for analysis purposes, there are no direct or indirect effects to any of the alternatives for the public system being considered.

3.7.3 Cumulative Effects

The cumulative effects area for the transportation system is described as the analysis area plus all the routes connecting it to the surrounding public routes. While this cannot be spatially bound to an exact distance outside of the analysis area, generally this transportation network should edge-match with other National Forests or BLM Field Offices and other public routes (state, county, etc) so that incompatible uses do not occur in the middle of a route by crossing jurisdictional boundaries. The historic uses of the existing transportation system include: livestock grazing, water improvements, timber harvest, fire, maintenance of irrigation ditches, tourism, and recreation (including hunting). For whichever alternative is selected the cumulative effects to transportation system will be the same. As user numbers continue to increase, there will be a continued increase in demand for routes to meet specific user needs. Additional maintenance needs will continue to be realized and the maintenance backlog deficit will continue to grow unless off-set through grants, volunteers, and partnerships. User demand and use patterns will also direct future travel management decisions that may reflect changes in any of the elements discussed in the above sections.

3.8 Heritage Resources _____

3.8.1 Affected Environment

The cultural (“heritage”) resource analysis of the action alternatives was conducted in compliance with the National Historic Preservation Act, the Colorado State Protocol Agreement, and other Federal law, regulation, policy, and guidelines regarding cultural resources. In general, cultural resources inventories are conducted to meet requirements of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321), the Federal Land

Policy Management Act of 1979 (43 U.S.C. 1701), and the National Historic Preservation Act of 1966 (NHPA). These laws are concerned with the identification, evaluation, and protection of fragile, non-renewable evidence of human activity, occupation and endeavor reflected in districts, sites, structures, artifacts, objects, ruins, works of art, architecture, and natural features that were of importance in human events. Such resources tend to be localized and highly sensitive to disturbance.

Part of the inventory process is to ascertain the significance of any recorded cultural properties. The National Historic Preservation Act of 1966 (NHPA) directs Federal agencies to ensure that Federally-initiated or authorized actions do not inadvertently disturb or destroy significant cultural resource values. The final determination of the site significance is made by the controlling agencies in consultation with the State Historic Preservation Officer (SHPO).

In the summer of 2009, U.S. Forest Service employees conducted an intensive (100%) cultural resource inventory of new proposed disturbance areas for trail designation. No sites were identified. A negative results report was sent to the State Historic Preservation Office (SHPO).

Additionally, the Grand Mesa, Uncompahgre and Gunnison National Forests (GMUG) are in the process of finalizing a programmatic agreement with SHPO related to travel-related activities and survey requirements.

3.8.2 No Action Alternatives Environmental Effects

Under the No Action alternative, existing activities would continue including cross-country mechanized travel. Since cross-country mechanized travel can occur anywhere there is the possibility that heritage resources could inadvertently be negatively impacted through soil compaction or site disturbance.

3.8.3 All Action Alternatives Environmental Effects

Under the Action Alternatives, there would be no measurable effect to heritage resources from mechanized travel on designated routes. The action alternatives are consistent with the direction in the GMUG's programmatic agreement with SHPO regarding surveying and consultation for travel-related activities. The restriction of mechanized travel to designated routes would minimize impacts to cultural resources.

3.8.4 Cumulative Effects

Worldwide, the trend is the loss of cultural resources due to development, public access, natural weathering, erosion and fire, to list a few examples. Cultural resources are a nonrenewable resource whose financial and educational value is just being realized. The increase in accessibility/use of public lands and increasing populations has the potential to adversely affect the cultural landscape. The restriction of travel activities to designated routes would continue to minimize impacts to cultural resources.

3.9 Other Resources _____

3.9.1 Affected Environment

Range Permits and Special Use Permits exist throughout the Grand Mesa National Forest.

3.9.2 Environmental Effects All Alternatives

Implementation of any of the alternatives would have no effect on existing permits.

3.9.3 Cumulative Effects

The historic uses of the area include: livestock grazing, water improvements, timber harvest, fire, maintenance of irrigation ditches, tourism, and recreation (including hunting). For whichever alternative is selected the cumulative effects would be the same. As user numbers continue to increase, there would be a continued increase in demand for routes to meet specific user needs which may at some point negatively impact other uses in the public or other permitted users.

Short-term Uses and Long-term Productivity _____

NEPA requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

See Chapter 3 environmental consequences sections Soils, Watershed & Vegetation, Sensitive Species, Management Indicator Species, Recreation, Transportation System & Safety, and Heritage Resources for discussions related to the relationships between short-term uses and long-term productivity.

Unavoidable Adverse Effects _____

Alternatives 2 and 3 would remove very small pieces of wildlife habitat for the construction of mechanized trails. These two alternatives may also have sedimentation effects during construction of new routes, however best management practices would minimize this.

Irreversible/Irretrievable Commitments of Resources ____

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road.

Irretrievable commitments would occur under Alternatives 2 and 3 where trail construction would occur. While these trails are in place, range resources and timber productivity would

be reduced proportionately (minimally) to the trail disturbance. There would be no irreversible commitments under any of the action alternatives.

Cumulative Effects _____

Cumulative effects are addressed under each topic area in Chapter 3.

Other Required Disclosures _____

NEPA at 40 CFR 1502.25(a) directs “to the fullest extent possible, agencies shall [documents] concurrently with and integrated with ...other environmental review laws and executive orders.”

The Forest Service has consulted with the agencies listed below, as required:

- Consultation with State Historical Preservation Office in compliance with National Historic Preservation Act for causing ground disturbing actions with potential to affect heritage resources;
- Informal consultation with U.S. Fish and Wildlife Service in accordance with the Endangered Species Act for effects on Canada Lynx.

CHAPTER 4. CONSULTATION AND COORDINATION

Preparers and Contributors

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

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Bureau of Land Management - Grand Junction Field Office

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White River National Forest – Rifle Ranger District and Supervisor’s Office

Gunnison National Forest

City of Palisade

US Fish and Wildlife Service

State Historic Preservation Office

TRIBES:

Ute Mountain Ute Indian Tribe

Southern Ute Indian Tribe

Ute Indian Tribe

OTHERS:

Colorado Plateau Mountain Bike Association (COPMOBA)

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