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Service

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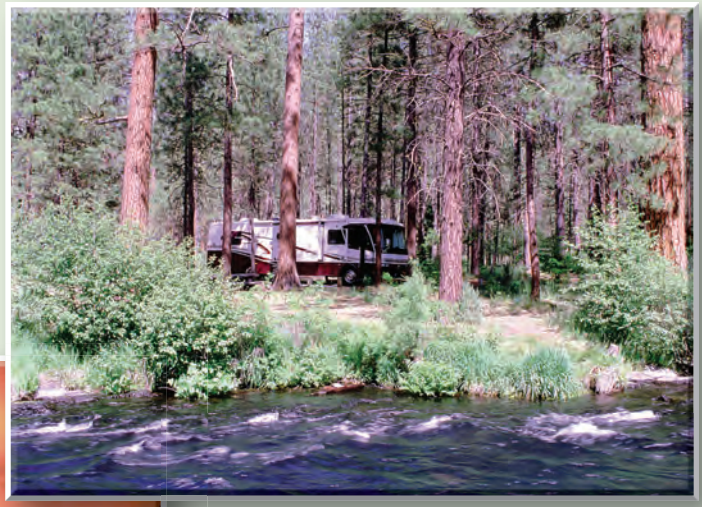
Draft Environmental Impact Statement

Travel Management Project

Deschutes National Forest, Ochoco National Forest, and Crooked River National Grassland

Deschutes, Jefferson, Crook, Klamath, Lake, Grant and Wheeler Counties, Oregon



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Travel Management Project
Draft
Environmental Impact Statement

Deschutes, Jefferson, Crook, Klamath, Lake, Grant and Wheeler Counties, Oregon

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Abstract: In accordance with 36 CFR 212, 251, 261, and 295, the Deschutes and Ochoco National Forests and the Crooked River National Grassland propose to prohibit motorized travel[1] outside of those existing, previously designated routes (roads and trails) and areas - where it is not already restricted or prohibited by law, regulation, policy, order, Forest Plan direction, or site-specific decision[2]. Some mineral material sources that currently do not prohibit motorized access off designated routes would be designated as open to

[1] Over the snow vehicles are excluded from this proposed action

[2] This includes past decisions to close or decommission National Forest system roads that may not have been implemented through physical barriers or signing, or where the closure method was limited to not conducting routine maintenance activities.

motorized access off designated routes (eg. cross-country travel). The Proposed Action would not close motorized public access on any roads currently designated as open (Forest Service maintenance level two or above). However, a few designated roads, which currently allow for by both highway legal and non-highway legal vehicles use (eg. OHV's), would prohibit use by the non-highway-legal vehicles based on the results of the Forests' motorized "mixed" use analysis. In order to eliminate minor inconsistencies between the beginning and ending seasons of use periods, some modifications would also be made. Existing designated routes and areas for motorized use according to the season of use (time of year the route and/or area is open for use) and class of vehicle (highway legal or non-highway-legal) are identified on the Deschutes and Ochoco National Forest and Crooked River National Grassland Proposed Action maps.

In accordance with provisions of the Travel Management Rule, the proposed action would allow for motorized access solely for the purpose of dispersed camping within 300' of the centerline of designated routes shown on the Proposed Action maps. The conditions for motorized access within 300' of the centerline of a designated route would, in accordance with the **general** provisions, as described in the Travel Management Rule, be limited to those classes of vehicles and seasons of use that apply to the adjacent designated route. Motorized access for dispersed camping from some designated routes would be subject to "**special provisions**." Proposed "**special provisions**" would allow motorized access within 300' of the centerline of a designated route for those classes of vehicles and seasons of use that apply to the designated route only for the purpose of accessing *designated, defined* or *existing* dispersed campsites (see Figs. 2-4). *Designated sites* are marked with a sign; *defined* sites limit motorized access with boulders or wood structures; and *existing sites* have established fire rings or other evidence of historic use. Motorized vehicles would not be permitted to cross streams except on designated routes in order to access sites. In riparian areas, motorized access to *existing* (not *designated* or *defined*) sites would be prohibited within 30' of the edge of a water body, wetland or stream course (see Fig. 5).

Reviewers should provide the Forest Service with their comments during the review period of the draft environmental impact statement (DEIS). This will enable the Forest Service to analyze and respond to the comments at one time and to use information acquired in the preparation of the final environmental impact statement, thus avoiding undue delay in the decision making process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewers' position and contentions. Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 553 (1978). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement. City of Angoon v. Hodel (9th Circuit, l986) and Wisconsin Heritages, Inc. v. Harris, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Comments on the DEIS should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

Comments: This comment period is intended to provide those interested in or affected by this activity an opportunity to make their concerns known. Those who participate and provide timely comments will be eligible to appeal the decision pursuant to 36 CFR part 215 regulations.

How to Comment and Timeframe: Written, facsimile, hand-delivered, oral, and electronic comments concerning this action will be accepted for 45 calendar days following publication of a notice of availability for this DEIS in the federal register. The publication date in the federal register is the exclusive means for calculating the comment period for this proposal. Those wishing to comment should not rely upon dates or timeframe information provided by any other source.

Written or hand- delivered comments must be submitted to: John Alllen, Forest Supervisor, Deschutes National Forest, 1001 SW Emkay Drive, Bend, OR 97702,Attention: Travel Management; or to Jeff Walter, Forest Supervisor, Ochoco National Forest, 3160 NE Third St., Prineville, OR 97754, Attention: Travel Management. The office business hours for those submitting hand-delivered comments are 7:45 A.M. to 4:30 P.M. Monday through Friday, excluding holidays. Oral comments must be provided at the Responsible Official's office during normal business hours via telephone (541) 383-5300 or in person. Electronic comments must be submitted in a format such as an email message, plain text (.txt), rich text format (.rtf), or

Word (.doc). If no identifiable name is attached to a comment, a verification of identity will be required for appeal eligibility. Send comments to: comments-pacificnorthwest-deschutes@fs.fed.us. . In cases using an electronic message, a scanned signature is one way to provide verification. Emails submitted to email addresses other than the one listed above, in other formats than those listed, or containing viruses will be rejected.

It is the responsibility of persons providing comments to submit them by the close of the comment period and ensure that their comments have been received. Individuals and organizations wishing to be eligible to appeal must meet the information requirements of 36 CFR 215.6.

Contact Person:

For additional information concerning the specific activities authorized with the decision, you may contact: Mollie Chaudet or Peggy Fisher, Interdisciplinary Team Leaders, at the Deschutes National Forest Supervisor's Office, 1001 SW Emkay Drive, Bend, OR 97702 @ (541) 383- 5300.

Send Comments to:

John P. Allen

1001 SW Emkay Drive

Bend, OR 97702

Or

Jeff P. Walter

3160 NE Third Street

Prineville, OR 97754

Date Comments Must Be Received: Public Comments are due 45 days after the notice of availability for this DEIS is published in the federal register.

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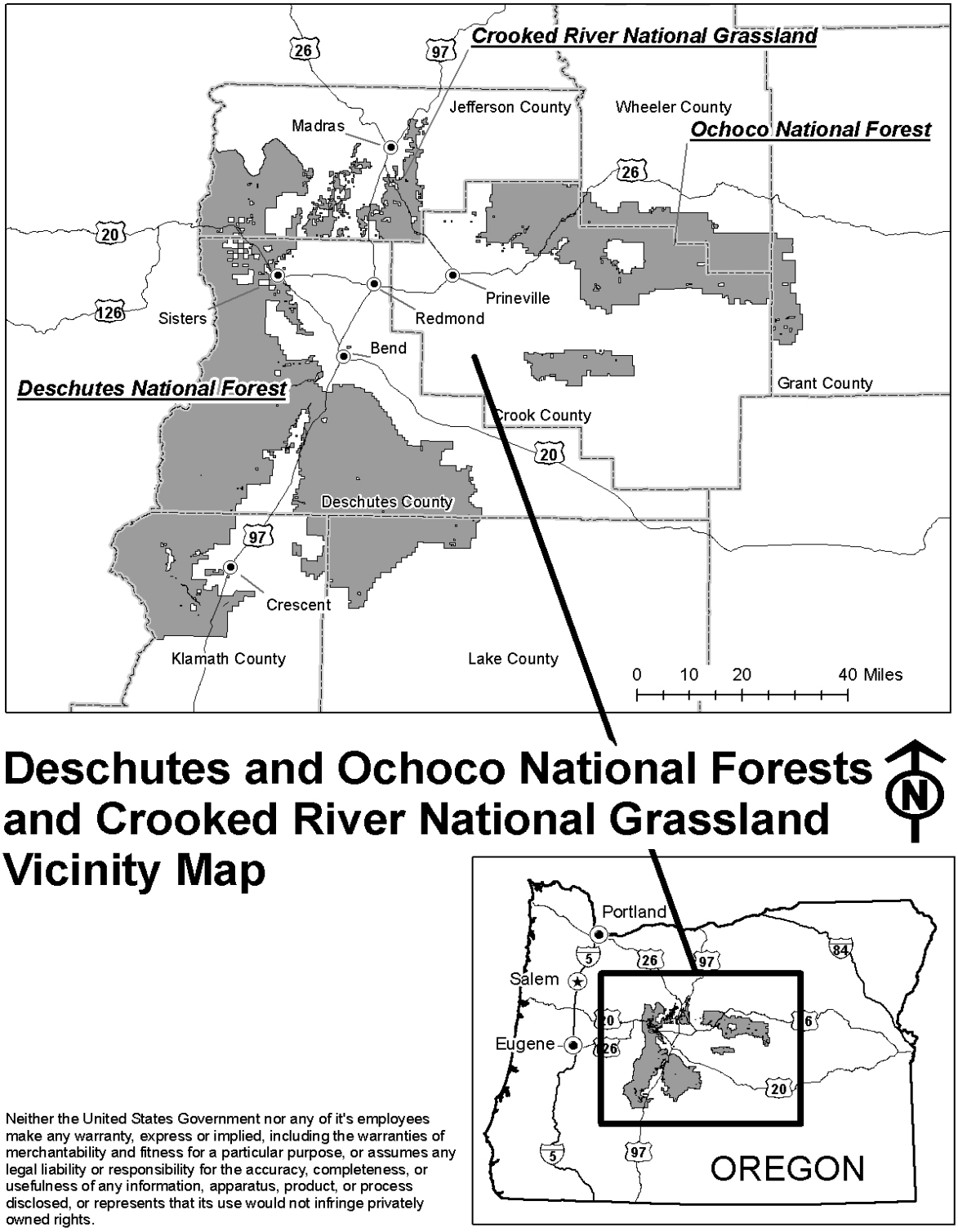


Figure 1 - Deschutes and Ochoco National Forest and Crooked River National Grassland Vicinity

CHAPTER 1. PURPOSE AND NEED FOR ACTION

Document Structure

The Forest Service has prepared this Draft Environmental Impact Statement (DEIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This DEIS discloses the direct, indirect, and cumulative environmental 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. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- ***Chapter 3. Affected Environment and Environmental Consequences:*** This chapter describes the 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 DEIS.
- ***References:*** A list of the scientific references used in the DEIS.
- ***Glossary:*** Definitions of the specialized terms used in the DEIS
- ***Index:*** The index provides page numbers for document topic.
- ***Appendices:*** The appendices provide more detailed information to support the analyses presented in the DEIS.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Deschutes National Forest (NF) Headquarters office.

Background

In 2005, the U.S. Forest Service issued national regulations[3] to allow motorized use only on designated[4] routes (roads and trails) and in designated areas on all national forests. These regulations, called "Travel Management: Designated Motorized Access for National Forests and Grasslands," (and called hereafter the "Travel Management Rule" or Rule) directed the National Forests and Grasslands to publish a Motor Vehicle Use Map (MVUM) that would show where and under what conditions designated motorized access would be allowed for all motor vehicles. The Rule establishes specific codes under federal regulations (CFRs) to enforce a consistent nationwide approach of allowing motorized access on National Forests and Grasslands only as shown on the Motor Vehicle Use Map.

[3] 36 CFR Parts 212, 251-261, and 295

[4] A designation of a road or trail includes all terminal facilities, trailheads, parking lots, and turnouts associated with the road or trail. The designation also includes parking a motor vehicle on the side of the road when it is safe to do so without causing damage to NFS resources or facilities, unless prohibited by state law, a traffic sign, or an order (36 CFR 261.54). Road designations must specify either that they include parking within one vehicle length, or within a specified distance of up to 30 feet, from the edge of the road surface

When considering how to implement the Rule, the Deschutes and Ochoco National Forest[5] Supervisors realized their efforts would have to be sharply focused to accomplish such a change in how people have used motor vehicles to access the two Forests. They focused their efforts by considering the following factors:

- There are currently approximately 11,432 miles of roads under Forest Service jurisdiction across Central Oregon on the Deschutes and Ochoco National Forests and the Crooked River National Grassland, with about 8,000 miles that are designated as open to motorized use. Motor vehicle use on these roads has historically been allowed consistent with Oregon law, and are open to use by highway legal vehicles only or open to both highway and non-highway-legal vehicles. Approximately 90 percent of these roads are open for use by non-highway-legal vehicles. The Travel Management Rule and Forest Service policy allows for these past motorized use designations to be incorporated without change as the designated routes required to be shown on the Motor Vehicle Use Map (CFR 215.50(b)).
- On the Deschutes National Forest, the East Fort Rock OHV Trail System provides 318 miles of designated motorized trails and 3 play areas designed for and open throughout the year to ATVs and dirt bikes and one rock crawl play area open to all classes of vehicles. The Edison OHV Trail System provides 25 miles of designated motorized trails designed for and open seasonally to motorized vehicles under 80" width. On the Ochoco National Forest, the 8 ½ mile Green Mountain Trail is open to ATVs and dirt bikes only, as well as the 18 mile Henderson OHV Trail System on the Crooked River National Grassland, which is open seasonally. The nearby Millican OHV Trail System on public lands administered by the BLM adds an additional 111 miles of motorized trails open year-round and 145 miles open seasonally. Still, largely unregulated motorized access off designated routes (cross-country travel) has resulted in a proliferation of unauthorized trails often concentrated near population centers, but present across the forests.
- The two motorized activities most likely to be significantly affected by prohibiting motorized use outside of or off of existing designated roads, trails, and areas would be:
  - Motorized access for dispersed camping (MADC):
    Many forest users travel off of existing designated routes to access existing “dispersed” or informal campsites, which is still an important recreation use in the National Forests.
  - Motorized travel off designated routes (MAODR) by off-highway vehicles:
    There are many unauthorized routes that have provided the public specialized trail (single-track motorcycle, 4- wheel drive rock crawling, or all-terrain vehicles trails) or cross-country motorized access.
- There are insufficient budgets and resources to inventory and evaluate every existing designated and unauthorized route or use area on both forests in order to complete a comprehensive site-specific decision for all future designated motorized routes and complete a timely publication of the first Motor Vehicle Use Map.
- The Rule allows an option to only consider non-winter (motor vehicles that do not qualify as over-the-snow) motorized use.
- National Forest System roads on the Deschutes and Ochoco National Forests have existing designations that follow state regulation, and allow for motorized “mixed” use of highway and non-highway-legal vehicles on roads which are classified by the Forest Service as “Maintenance Level 2.”

Based on these considerations, the Forest Supervisors identified a two-part strategy to implement the Rule for non-winter use to meet the prescribed time frame that was within the capacity of their available resources

[5] The Crooked River National Grassland is administered by the Ochoco National Forest. All references in this document to the Ochoco National Forest are intended to include the Crooked River National Grassland unless specifically noted otherwise. The Emigrant Creek Ranger District is administered by the Malheur National Forest and is not included in this analysis.

and anticipated grants and budgets. The first part of the strategy was to keep open to motorized access, consistent with current existing conditions:

- all designated open roads that are considered suitable to continue motorized "mixed" use of highway-legal and non-highway-legal vehicles
- existing designated motorized routes and areas within the Deschutes and Ochoco National Forest's designated OHV trail systems
- motorized access for dispersed camping under conditions that would be consistent with the Rule and provide for resource considerations.

The second part of the strategy was to identify for consideration in the near term specialized areas for designated motorized routes, as well as areas for non-highway-legal motorized use.

In 2006-2007, the Deschutes and Ochoco National Forests worked with a chartered federal advisory committee to develop a strategy for implementing the rule that included two distinct outcomes. Both outcomes started with an established baseline6 of our existing designated routes that were already designated for motorized use by class of vehicle and seasons of use. The outcomes were recommendations7 for:

- options and criteria for providing motorized access for dispersed camping within the boundaries established by the rule; and
- areas that could be considered for developing specialized motorized trail systems

These two outcomes are the starting points for developing specific proposed actions to implement the Travel Management Rule. The intent of the national Rule was to be carried forward locally under the National Environmental Policy Act (NEPA). The two parts of the strategy are both a result of the Forest Supervisor's interest in mitigating some of the expected effects of prohibiting motorized access off of designated routes. However, the proposed actions resulting from each part of the strategy have a very different scope and scale, and are therefore considered distinct and separate federal actions under the procedures of the National Environmental Policy Act. This DEIS would implement the first part of the strategy, while separate environmental analyses are being conducted for identifying motorized trail systems across the two Forests.

Purpose and Need for Action

The Travel Management Rule was passed because of a **need** to resolve a number of resource and social concerns related to unregulated motorized travel that were detailed in the Rule. These included concerns such as:

- Confusion about where or when motorized access is or is not allowed, or for what type of vehicle, and how or where to find that information
- Resource damage from inappropriate motorized uses
- Conflicts between motorized and non-motorized users
- Quality of recreational experiences for all forest users

Many of these concerns are illustrated on the Deschutes and Ochoco National Forests and the Crooked River National Grassland as well. For instance, the entire Crooked River National Grassland is currently closed to motorized travel off of designated routes, but the repeated costs associated with posting areas "closed" has made enforcement difficult. National Forest lands have a mixture of designations related to motorized travel on and off roads as well as there being seasonal restrictions both on and off some routes for various types of vehicles. Specifics regarding management direction for motorized access for highway and non-highway-legal vehicles have been sometimes inconsistent across the Forests, adding to the general confusion about how

[6] The existing routes were part of the National Forest system of roads and trails and were the result of previous administrative actions.
[7] Complete list of recommendation can be on the web at http://www.fs.fed.us/r6/centraloregon/travel-mgmt/documents/20070604_final_appvd_pacrecommend.pdf

management direction has been intended to be applied. Resource damage from inappropriate motorized use has increased on both Forests, perhaps driven by an increase in the types of vehicles available to the growing Oregon population. Population growth has also contributed to an increase in social conflicts, often between motorized and non-motorized users on the National Forests and Grassland.

The Deschutes and Ochoco National Forests have a **need** to implement the provisions of the Travel Management Rule – including provisions to allow for reasonable motorized access for dispersed camping - to publish a timely initial Motor Vehicle Use Map. There is also a need to comply with Pacific NW Regional direction to review routes that would be shown on the Motor Vehicle Use Map as available for motorized "mixed" use under current designations (Oregon State Law) to determine if conditions may warrant changing that allowable use to highway-legal vehicles only. Based on initial review of the seasons of use on existing designated routes, there is also a limited need to make minor changes to the seasons of use in some areas to eliminate minor inconsistencies between those seasons of use.

The **purpose** of the actions proposed in this DEIS are to:

- implement the 2005 Travel Management Rule provision[8] to prohibit all motorized access off existing, previously designated routes, and outside existing, previously designated areas where such use is not currently prohibited or otherwise restricted by past actions (eg. eliminate cross-country travel)
- improve public safety, by implementing Forest Service Regional policy to determine the suitability of continuing to allow for motorized "mixed" use[9] (eg. analyze those roads which currently allow for motorized "mixed[10]" use under Oregon State Law)
- establish conditions or provisions to allow for motorized access for dispersed camping (MADC) that are consistent with the Travel Management Rule
- where appropriate, to reduce minor inconsistencies, make minor changes to the seasons of use for designated routes
- clarify the current conditions of use for motorized access on existing designated National Forest system (NFS) routes and current management direction for motorized access for dispersed camping
- amend the Ochoco National Forest Plan to restrict motorized access to designated routes consistent with the Travel Management Rule and proposed conditions for motorized access for dispersed camping

Proposed Action

In accordance with 36 CFR 212, 251, 261, and 295, the Deschutes and Ochoco National Forests and the Crooked River National Grassland, having established through past administrative decisions an extensive system of designated routes and areas for motorized vehicle use in accordance with CFR 212.50; propose to:

- Prohibit motorized travel[11] outside of those existing designated routes (roads and trails) and areas - where it is not already restricted or prohibited by law, regulation, policy, order, Forest Plan direction, or site-specific decision[12].
- Prohibit motorized use by non-highway-legal vehicles on some routes that currently allow both highway-legal and non-highway-legal vehicles based on the results of the Forest Service motorized "mixed" use analysis.
- Amend both the Ochoco and Deschutes Forest Plans to modify some of the existing seasons of use on some routes to eliminate inconsistencies between beginning and ending seasonal use periods.

[8] Excluding over-snow vehicles
[9] Highway-legal (meets State standards for a vehicle driving on a state highway) and non-highway-legal vehicles (does not meet State standards for a vehicle driving on a state highway)
[10] Use by highway and non-highway-legal vehicles currently allowed under Oregon State regulation
[11] Over the snow vehicles are excluded from this proposed action
[12] This includes past decisions to close or decommission National Forest system roads that may not have been implemented through physical barriers or signing, or where the closure method was limited to not conducting routine maintenance activities.

- In accordance with CFR 212.51 (b), allow motorized access for the purpose of dispersed camping within 300' of the centerline of designated routes shown on the Proposed Action maps (CD 1). Motorized access within 300' of the centerline of a designated route would be subject to the **general** provisions of CFR 212.51. These **general** provisions allow for limited motorized access within those areas to those classes of vehicles and seasons of use that apply to the adjacent designated route solely for the purpose of dispersed camping.
- Motorized access for dispersed camping (MADC) along some routes would be subject to "**special** provisions." Proposed "**special** provision" areas would allow motorized access within 300' of the centerline of a designated route for those classes of vehicles and seasons of use that apply to the designated route only for the purpose of accessing *designated, defined* or *existing* dispersed campsites. See Figures 2-5

Figure 2 - DESIGNATED sites, marked with a sign

Figure 3 - DEFINED sites, limiting motorized access with boulders or wood structures

Figure 4 - EXISTING sites have established fire rings or other evidence of past use

Figure 5 - RIPARIAN[13] areas: motorized access to EXISTING sites no closer than 30' to edge of stream, wetland, or water body

The Proposed Action would also:

- Amend the Ochoco National Forest Plan to be consistent with the Travel Mangement Rule
- Amend the Ochoco National Forest Plan to allow for motorized access for dispersed camping within 300' of open designated routes on the Crooked River National Grassland subject to the general and special provisions of the proposed action.

Based on public comments on this proposed action during public meetings, and written comments following publication of the proposed action and Notice of Intent in the federal register, some modifications to the original proposed action were made. The proposed action was modified to include some rock/cinder pits that are currently open to motorized use as designated areas that would be open to motorized access off designated routes (cross-country travel). Motorized access for dispersed camping within Inventoried Roadless Areas was modified to allow for that access only to *designated, defined* or *existing* sites.

[13] Areas adjacent to streams, wetlands, lakes or springs

Maps that illustrate the existing designated routes and areas for motorized use according to the season of use (open to use time frame) and class of vehicle (highway-legal or non-highway-legal) are available in CD format with the DEIS, on the Deschutes and Ochoco National Forests Travel Management website, and are also available at Deschutes and Ochoco National Forest Ranger Districts and Headquarters offices. Overview maps are included in Appendix A-1.1 – A-1.8

Decision Framework

Given the purpose of and need for action, the deciding official reviewed the proposed action, the other alternatives, and the environmental consequences in order to make the following decisions:

- determine whether or under what conditions motorized travel off of existing designated routes and outside of existing designated areas would be prohibited within the Deschutes and Ochoco National Forests and Crooked River National Grassland after the publication of the Motor Vehicle Use Map (MVUM) in accordance with the Travel Management Rule;
- determine whether or under what conditions exceptions allowed by the rule for motorized access would be provided for ingress and egress to dispersed campsites;
- determine whether or under what conditions motorized "mixed" use of highway and non-highway-legal vehicles on identified National Forest System roads would be allowed; and
- determine whether or under what conditions to amend Forest Plans.

Public Involvement

Public involvement in the Travel Management Rule is documented in the Travel Management Rule (36 CFR 212.52). On the Deschutes and Ochoco National Forests, there have been a variety of opportunities and methods for the public to become informed about, comment on, or get more involved in the local implementation of the Rule.

In July and August of 2006, six public workshops were held throughout Central Oregon to inform people about the Rule, discuss the strategy that was to be used locally to implement the rule, to ask people about the areas they valued the most for whatever activities they did there, and to offer people an opportunity to get involved with the advisory committee that would be developing recommendations on how to implement the rule. Approximately 300 people attended those meetings. There was another round of public workshops in July of 2007 that presented the results of the advisory committee's recommendations, and offered the public an opportunity to share their thoughts on the recommendation. Approximately 200 people attended those meetings.

The Notice of Intent (NOI) to prepare an DEIS for Implementing the Travel Management Rule on the Deschutes and Ochoco National Forests was published in the Federal Register on May 16, 2008. The NOI asked for public comment on the proposal from May 16- June 16, 2008. Between the months of May and June of 2008, six public workshops were held at various venues throughout Central Oregon to promote the upcoming Travel Management DEIS. These workshops were conducted in an "Open House" format consisting of poster displays and maps located at various stations throughout the venue which allowed for freedom of movement at the visitor's convenience. Visitors were encouraged to ask questions from any Forest Service employee present at these meetings, many which staffed the various stations. At each meeting, Forest staff, District Rangers, and Forest Supervisors were available to talk with people about the Travel Management Rule, and the local implementation strategy. Approximately 140 people attended these meetings.

The forests, with the assistance of the federal advisory committee, know as the Deschutes Provincial Advisory Committee or PAC, chartered a subcommittee or working group consisting of both members of the PAC and members of the public at large. The working group (WG) consisted of 30 some members

representing both motorized and non-motorized interests. Members represented specific organized groups, including but not limited to, Oregon Hunters Association, Deschutes County 4x4 club, Ochoco Trail Riders, Oregon Wild, Backcountry Horseman, Friends of the Metolius, and the general public at large. The group donated over 1,400 hours to help develop a strategy and recommendations for implementing the rule, which were later adopted by the PAC at large. These recommendations helped to develop the criteria later used to establish **special provisions** for motorized access for dispersed camping and to establish areas where the forest might propose potential future motorized trails. Working group members also assisted the Forest Service representatives in making presentations to various public groups and attended the public workshops to help describe the proposed action and their involvement in the process.

Website, Newsletters, Newspapers, and other Media Coverage

Since 2005, the two Forests have developed a network of information outlets regarding our strategy to implement the Travel Management Rule. These included, but were not limited to news releases, newsletters, and news articles. The 1,200 individuals on our mailing list were informed about the project through the newsletters. Five separate newsletters were sent to these individuals throughout the project development phase. Members of the public, not on the mailing list, were informed of the project's status through the newspaper of record and other local newspapers in the area. The newspaper of record for this project is Bend's daily newspaper, The Bulletin. Fourteen news releases were issued by the Forest Service to The Bulletin and other local papers, radio, and television services. Six news articles appeared in The Bulletin discussing the intent and progress of the project work. The local news, Fox 39 News produced two stories discussing upcoming public meetings and how to become more involved with project development. Announcements and interviews on local radio stations also accompanied most of the news releases, and provided periodic updates on the progress of the DEIS process.

Early in the process the forests developed an information section on our combined Central Oregon worldwide website[14] devoted to the Travel Management Rule and our implementation process. This website provides the public with notification of upcoming public workshops along with access to past newletters, news releases, the PAC recommendations and the majority of the materials presented at earlier public workshops, including maps. The website also provides the public with an updated timeframe and notification of how to comment on our process.

What We've Heard

Most of the comments on the planning process did not suggest specific changes to the proposed action of the Travel Management EIS. Many comments focused on how the Rule would be implemented, how the process to establish the Rule had not taken their concerns or desires into account, whether people would be able to understand where they could take a motor vehicle, whether there was sufficient law enforcement to implement such a sweeping change in where motorized access was allowed, and whether such a Rule was fair to aging populations. Some people thought that the forest should be completely closed to off-highway vehicles and many thought the restrictions proposed to implement the Rule were unreasonably limiting.

Many of the comments which apply to the proposed action centered around the following concerns:

- Motorized access for seniors, veterans, or people less able to access National Forest lands with non-motorized means
- Allowing big game retrieval with an ATV while hunting
- Motorized access for dispersed camping within 300' is not enough distance or is too much distance
- OHV's are not compatible with dispersed camping areas or OHV's are an important part of camping experience
- Limiting motorized access to dispersed camping areas that have provided recreational opportunities for generations

[14] website address: http://www.fs.fed.us/r6/centraloregon/travel-mgmt/

- Limiting motorized access within Inventoried Roadless Areas

Motorized access is a subject of strong and often polarized public passion. Some people are opposed to a national rule limiting their ability to access National Forest lands with a motorized vehicle to designated routes and areas, while others are supportive of the rule. Some would be supportive of the rule if there were enough suitable designated riding areas. Many users feel that the amount of currently designated motorized trail areas is insufficient in either miles of trail or specialized classes of trails to provide for even a portion of the recreational demand. These users also feel that prohibiting travel off of designated routes would result in increasing already crowded conditions on the designated trail systems.

For many older respondents, versatile off-highway vehicles are an important part of their ability to keep "getting out in the woods" as they experience declines in their physical abilities. Others use non-highway-legal vehicles as an alternative to larger highway-legal vehicles for short-distance local travel.

Some people are also concerned that implementation of the Rule would close roads that they have used in the past. They may be using old roads or old skid trails that look just like a low maintenance road that is open to the public, but in fact have been closed by administrative decision, just not yet physically blocked to motorized travel. People are also concerned whether non-highway-legal vehicles may be allowed on all roads under the new rules; and would like to see more of these routes become designated routes for non-highway-legal vehicles. Some people also believe that the open designated motorized road and transportation system on the Deschutes and Ochoco National Forests is too wide-spread – that road densities are "too high" – for optimal wildlife habitat, to provide sufficient quantities of high quality non-motorized recreation opportunities, or to adequately provide for general healthy watersheds and forests; and would like to have additional open designated routes closed. Many respondents from across the spectrum are also concerned about the ability of the agency to enforce a rule with such widespread implications.

The response to our proposed implementation of this Rule has been robust. All of the comments received were considered to determine whether they were within the scope of the proposed action and categorized into issues as described in the following section.

Issues

Issues are points of discussion, debate, or dispute about environmental effects – including social and economic - or competing uses of the resources that may occur as a result of the proposed action. The issues concerning the proposed action were submitted during the scoping period, or gathered as a result of the varied opportunities the public has had to give feedback as described above. The comments provided ranged from very general comments on many topics including the Travel Management Rule, to desires by some commenters for very specific actions to be taken. In order to sort through this variety of comments, the comments were classified in several groups, the first being significant and non-significant issues. Issues were classified as significant if they indicated a direct, indirect, or cumulative effect on (1) forest resources or public use of the forest by implementing the proposed action or (2) Alternatives that would better inform the Responsible Official's decision.

Significant Issues

The project Interdisciplinary Team further sorted the significant issues into categories to help track how these issues are addressed throughout this document. They were sorted into the following categories:

Key Issues are used to modify or develop an Alternative to the Proposed Action. The Key Issues are specific to the proposed action and the project area. Measures or indicators have been identified following the issue description to assist readers in tracking how the effects of these issues are evaluated throughout the analysis

Other Issues are identified and used to describe the effects of the alternatives on important physical and biological resources or social and economic conditions. Measures or indicators have also been identified

following some of the issue descriptions to further assist readers in tracking how the effects of these other issues are evaluated throughout the analysis.

Key Issues

Motorized Access off Designated Routes

Areas open to motorized access off designated routes

There are mineral material sources, existing rock, gravel and/or cinder pits (and called hereafter rock/cinder pits), that are currently open to motorized use that were **not** included in the proposed action as designated. Some of these rock/cinder pits would continue to be "open to motorized access off designated routes". Several of these rock/cinder pits may be prized by off-highway vehicle users that like a variety of technical challenges. These areas also offer little chance for resource damage because they are already designated and developed for mineral extraction. Many of these areas have historically been used on both Forests for dispersed camping, target practice, rock crawling and staging areas for recreation activities, in addition to their primary aggregate use.

Response: The Proposed Action was modified to include criteria for maintaining current or designate future rock/cinder pits as "open to motorized access off designated routes (cross-country travel)." After evaluating the over 200 rock/cinder pits on the two Forests against these criteria, some rock/cinder pits that met these criteria were proposed to be designated as areas open to motorized access off designated routes (cross-country travel) that were not actively being used for extraction of mineral material sources.

Key Indicator: The number and acreage of rock/cinder pits designated as open to motorized access off designated routes (cross-country travel)

Motorized Access for Dispersed Camping

Areas designated as open to motorized access for dispersed camping –

Some people expressed concern about the potential impacts to resources such as soils, wildlife and vegetation, of continuing to allow motorized access for dispersed camping within 300' of most existing open designated routes. This concern was highlighted for sensitive areas such as riparian areas, but extended to other areas within the forest as well. Concerns included denuding of vegetation, harassment of wildlife, soil compaction and spread of invasive species to name a few.

The proposed action would allow motorized access for dispersed camping within 300' of most roads, but would modify the conditions for this motorized access. Under the Travel Management Rule, all motorized access for dispersed camping would be subject to the **general** provisions identified in the Rule. These provisions limit motorized access for dispersed camping to the same class of vehicle and season of use as the adjacent open designated road, and restrict motorized access within that specified distance solely for the purpose of dispersed camping. The proposed action also includes **special** provisions for motorized access for dispersed camping in all riparian areas, and in non-riparian (upland) areas with other sensitive resources as identified by the Forest Service. These **special** provision areas would limit motorized access for dispersed camping to *designated*, *defined* and *existing* sites; and would establish a 30' setback for motorized access for dispersed camping to any *existing* site near a stream course, wetland, or waterbody. (See Figs 2-5)

People were concerned that the areas designated as open to motorized access for dispersed camping under the **general** provisions could have a higher potential for development of new motorized access points and dispersed sites than those areas where the **special** provisions would apply.

Response: Alternative 3 was developed to respond to this issue. Alternative 3 would apply **special** provisions to **all** roads proposed as open to motorized access for dispersed camping under in Alternative 2, not just riparian areas and non-riparian (upland) areas identified to have other sensitive resources.

Key Indicators: Acres designated as open for motorized access for dispersed camping under the **general** provisions of the Travel Management Rule; acres designated as open for motorized access for dispersed camping under **special** provisions in Alternatives 2 and 3.

Inventoried Roadless Areas

Inventoried Roadless areas have been identified as an important resource through a variety of venues. These areas are important to many people for a variety of reasons, including the potential for the areas to become future wilderness. The proposed action would allow for motorized access for dispersed camping within Inventoried Roadless Areas within 300' of existing designated open roads subject to the **general** provisions of the Rule. If those roads are within 300' of a streamcourse, wetland or waterbody, motorized access for dispersed camping would be allowed only under **special** provisions. Commentors during the scoping process expressed concerns about the effects of continued motorized access within these Inventoried Roadless Areas on roadless characteristics and wilderness potential.

Response: This issue had two responses. The original proposed action was modified to allow for motorized access for dispersed camping within Inventoried Roadless Areas only under **special** provisions in all cases, rather than only **special** provisions only in riparian areas. Alternative 3 was also designed to be responsive to this issue by prohibiting motorized access for dispersed camping within all Inventoried Roadless Areas.

Key Indicators – Acres designated as open to motorized access for dispersed camping with **special** provisions or closed within Inventoried Roadless Areas.

Other Issues

Public comments were robust concerning the proposed implementation of the Rule. Many of these comments expressed concern over what were perceived as potentially adverse social and recreational impacts of the proposed action or alternatives and the perceived beneficial effects on the physical and biological components of the environment. The following description of these issues briefly focuses on what are the most important potential indicators of effects of the proposed actions in this DEIS.

Recreation

Motorized Recreation

The proposed action would affect those motorized users that currently travel off of designated routes (travel cross-country) by limiting motorized access to existing designated routes and areas. The proposed action would continue to provide for motorized access for dispersed camping, and continue to allow "open" motorized use according to existing guidance in some of the rock/cinder pits and in motorized play or staging areas in currently designated ohv areas.

While there are over 7,000 miles of roads available for non-highway-legal vehicles, roads do not always provide the recreational experience that many people look for on their off-highway vehicles, as roads do not provide the kind of technical challenge or primitive setting that users may desire. Roads that allow non-highway-legal vehicles do not always connect between popular destinations and people's homes or campsites. When motorized use is limited to designated routes, or if key connecting roads restrict or prohibit use by non-highway-legal vehicles, it results in a change in people's ability to access the forest as they have in the past.

The proposed action would substantially reduce the amount of acres available for motorized travel off of designated routes. These acres may also include NFS roads that have been designated as closed to motorized vehicles (identified as maintenance level 1) that look like an open designated road and have been used accordingly by the public. There are unauthorized trails created by a variety of forest recreationists and old skid trails created during logging that the public has used in the past for recreational motorized access. While there are additional motorized trail systems currently in the planning stages that could provide additional specialized motorized recreational opportunities within the next 3 to 5 years, there is uncertainty regarding the ultimate outcome of those systems and the degree to which they will adequately replace the current perceived area available for recreational motorized use.

The proposed action would also reduce the amount of acres available for motorized access in locations where wildfires and vegetation treatments (hazardous fuels, timber, and/or silvicultural) have reduced forest and undergrowth densities adjacent to existing open designated routes.

Changes in how and where motorized access for dispersed camping would be allowed would also affect people who use motorized vehicles to access dispersed camping sites. Currently, with some exceptions, motorized access for dispersed camping has generally been allowed wherever it might occur. In areas such as the Grassland where motorized access off designated routes has been prohibited for many years, the rule has not been understood to apply to motorized access for dispersed camping, except where associated with road closures during some of the cooperative hunting season closures. In the case of the Grassland, the proposed action and Alternative 3 would amend the Forest Plan to allow for motorized access for dispersed camping under general and/or special provisions adjacent to existing open roads where it is not now legally permitted. In other cases, the proposed action and alternative would add additional prohibitions or regulations to motorized access for dispersed camping, depending upon where there are designated open roads, what class of vehicle is allowed on the road, and what season of use the road is available for motorized access.

Indicators of Effects:

- Acres available to motorized access off designated routes;
- Miles of existing designated motorized trails;
- Miles of designated road by class of vehicle and season of use
- Acres open or closed to motorized access for dispersed camping and conditions for use
- Percent of Forest within ½ mile of open designated roads

Non-Motorized Recreation

Non-motorized recreation continues to be one of the most popular categories of recreation throughout the state and within the local region. The proposed action would indirectly affect forest users that prefer non-motorized access and recreational activities by prohibiting motorized access off designated routes and by prohibiting motorized access for dispersed camping in some areas. The proposed action would result in increasing the total acreage closed to motorized access compared to the acres currently designated as closed on the two forests. There would be a substantial increase in the areas/acres where non-motorized recreation users could expect to not encounter motorized users. There are many miles of non-motorized trail systems throughout the areas where motorized access off designated routes would be prohibited. Reduced motorized access to these non-motorized trail systems would also reduce the potential for inadvertent use of non-motorized trails by motor vehicles.

Indicators of Effects:

- Acres proposed closed to motorized access off designated routes or closed to motorized access for dispersed camping
- Miles of non-motorized trails in areas proposed closed to motorized access off designated routes.

Congressionally Designated Areas

Congressionally Designated Areas (CDAs) are areas that Congress has identified as having unique characteristics. On the Ochoco and Deschutes NF these areas include wilderness areas, national recreation and research areas, wild and scenic river corridors, areas of special geological interest, and historic trails and sites. The proposed action would reduce the potential of motorized use to affect the outstandingly remarkable values of our Congressionally Designated Areas, as motorized use would be restricted to designated routes and motorized access for dispersed camping would be limited. The proposed action would help to protect and enhance the values for each of these special areas.

Indicators of Effects:

- Overall acres proposed closed to motorized access off designated routes or closed to motorized access for dispersed camping within CDA's
- Acres proposed closed to motorized access off designated routes within wild & scenic river corridors
- Acres proposed closed to motorized access for dispersed camping within wild & scenic river corridors

Social & Economic Factors

Virtually all visitors to and users of the National Forest do so in a motorized vehicle, if only for for the purposed of accessing a non-motorized trail head and/or recreational opportunity. Therefore, any new regulation of that activity has the potential to have a social impact. For the past decade, the central Oregon population has been continually growing and diversifying, sometimes more rapidly than any other population area in the state. The population is becoming more urbanized with the varying demands associated with increasingly recreation-oriented communities and economies. This growing population often results in conflicting values, beliefs and attitudes about regulation of motorized and non-motorized activities on National Forests. Information gathered during the planning process indicates that the attitudes, beliefs and values of residents and visitors to the central Oregon area are strongly tied to and sometimes inseparable from their activities on National Forest lands.

The proposed actions considered in this DEIS would prohibit motorized travel off designated routes (cross-country travel) and require the use of a Motor Vehicle Use Map (MVUM) to determine what routes are designated "open" to what class of vehicle (highway legal or non-highway-legal) during what season of use; and to understand where and under what conditions people can drive off a road to disperse camp. While similar regulation has been in place in many areas across the two Forests for some time (for instance, the Crooked River National Grassland prohibits all motorized access off of designated routes), the popular assumption that an area is "open" to travel on or off of designated routes unless posted "closed" has influenced and contributed to the development of the habits of all users of the National Forests. This has also led to a popular assumption of little current government regulation of motorized uses.

Motorized trail users, that participated or commented on the proposed actions, also expressed a lot of concern for the lack of specialized motorized "trail" experience and that this type of experience would be lost if they could no longer drive off of the designated system of roads and trails. As described in more detail in the recreation section, there is a limited amount of designated motorized trails that provide the technical challenge and primitive recreational experience for some classes of vehicles (4 wheel-drive and single track motorcycle especially). Some people feel the designated systems are overcrowded and in need of expansion. These activities are often family-oriented, encompassing a mix of age and family groups. Many motorized users expressed preferences for being able to combine group camping and off-road trail riding, as well as being able to access hunting or gathering areas.

Many people that expressed support for the Rule, also expressed their concern over the environmental impacts of noise, dust, soil erosion and compaction along with wildlife disturbance that they associated with unregulated motorized uses. Some people also indicated that motorized access off of designated routes, especially by Off-Highway Vehicles, encroached upon their rights to enjoy primarily non-motorized

activities offered by the National Forests. These people also identified the importance of the National Forests to their economic and spiritual well-being, and often expressed that they, too, had long used certain areas and were displaced from many of those areas by the increasing amount of off-highway motorized uses. These comments came from a variety of sources, including horseback riders, hikers, Nordic skiers, and non-motorized hunters, all with the same perspective that they too wanted to experience the National Forests in a manner that provided for "their" quality recreational experience.

Many people, regardless of motorized or non-motorized uses, have indicated that they made choices to live in or near the Forests because being able to access and recreate on public lands is important to themselves, their families, and their lifestyles. Someof these people live directly adjacent to public lands. These residential areas present a microcosm of the social conflicts associated with motorized and non-motorized users. They share in valuing the National Forests for their health and well-being, but want to conduct different activities to fulfill those values.

Understanding new regulations, reading and understanding the maps and successfully applying them to forest conditions also can result in unintentional unlawful activity, despite good intentions. This potential effect could be more prevalent based on a visitor's experience in navigating the outdoors, education level, or ability to read or speak in English.

Indicators of Effects:

- Potential effects on people's personal attitudes, social beliefs, and social values as reflected by:
    - Acres available to motorized access on and off of designated routes and motorized access for dispersed camping that affect valued experiences
    - Acres adjacent to landowners for motorized access off of designated routes
    - Potential user interactions or conflicts
    - Regulation of motorized access
- Effects on local regional, or national economies as represented by:
    - Motorized and non-motorized recreation activities
    - Use trends and associated economic contributions

Transportation

The proposed action would restrict <u>all</u> motorized vehicle use to designated routes and areas and require an Engineering Analysis to evaluate the suitability for allowing both highway-legal and non-highway-legal vehicles on the same designated routes, (i.e., motorized "mixed" use). Under the action alternatives, an increase in overall road use would be expected in areas where there is currently a high level of off-road OHV use, as these vehicles are now required to travel on designated roads verses cross-country. The effect of this increased use would be an increase in surface wear on some roads which may result in a need for additional maintenance work.

Preliminary analyses indicate that approximately 181 miles of roads on the Deschutes National Forest and 125 miles of roads on the Ochoco National Forest that are currently available for motorized "mixed" use would be changed to only allow highway-legal vehicles if either action alternative is implemented. As a consequence of this change, some connectivity between traditional OHV use areas may be changed or lost.

Indicators of Effects:

- Miles of roads changed to allow use by highway-legal vehicles only
- Areas demonstrating a loss of connectivity between traditional OHV use areas

Public Safety

The proposed action would change some roads that currently allow motorized "mixed" use by both highway and non-highway-legal vehicles to highway-legal vehicles only as a result of an engineering evaluation of the suitability of this use. Crash probability and severity of injuries would be expected to be reduced on those roads that are changed to allow only highway-legal vehicles. However, this change from mototized mixed

use to highway-legal only could also result in a loss of connections between routes and areas that are currently available to non-highway-legal vehicles.

Indicators of Effects:

- Miles of roads that change from motorized "mixed" use to highway-legal only
- Descriptions of the effects to non-highway-legal vehicle users resulting from not having those roads available for travel

Fisheries, Hydrology, Geology & Minerals, and Soils

The proposed action would change how motorized access for dispersed camping and motorized access off of designated routes would affect riparian and non-riparian (upland) vegetation, soils, landslide prone areas, and potentially groundwater quality.

The grass/forb and shrub components of the riparian understory contribute to stream bank stability, filtering of sediments or other pollutants, and in some cases, provide shade on streams and water bodies, particularly within 100' of a stream, wetland, or water body. Upland vegetation components also contribute to reducing erosion hazards and maintaining soil productivity.

Motorized use, especially concentrated and repeated, can denude the soil surface of understory vegetation, compact the soil profile and promote instability in landslide prone areas. These changes can increase the amount and energy of overland flows generated during storm events, reduce the filtration capacity of these areas and in some instances mobilize debris or landslide material, thereby increasing the risk of sediment production and transport to streams from riparian and adjacent non-riparian (upland) areas. Sediment movement from denuded areas that are close to streams, wetlands, and lakes can affect surface and groundwater quality (particularly in areas with highly permeable rock) and fish habitat. Although damaged vegetation, denuded soil, and compaction effects tend to be localized and generally do not contribute to changes in channel conditions, alteration of these components could provide an increase in fine sediment to water bodies. Changes to the understory vegetation in non-riparian (upland) areas can increase erosion hazards and decrease soil productivity. Dormant/active landslide terrain is by nature unconsolidated and has an increased potential for failure over consolidated soils. This potential for failure is further increased by compacting soils, altering water flow patterns, or creating roads within these areas.

Indicators of Effects:

- Acres open to motorized access off designated routes or open to motorized access for dispersed camping
- Acres open to motorized access off designated routes or open to motorized access for dispersed camping within 100' of a stream
- Changes in potential for turbidity or sediment introduction to streams as a result of changing motorized access off designated routes
- Acres within dormant/active landslide areas open to motorized access for dispersed camping, general and special provisions
- Lineal feet of stream banks with potential for denuded soils and loss of vegetation from motorized access to dispersed sites.
- Designated routes within 300' of a wetland, water body or stream course

Vegetation

Native Vegetation

Motorized use, especially concentrated and repeated use, can degrade native plant habitats by denuding areas of understory vegetation and compacting soils. Of particular concern are impacts to special habitats (areas which sustain unusual and/or particularly rich biological diversity) and rare plants and their habitats. The proposed action would reduce potential impacts to native plant habitats, including special and rare plant

habitats, by substantially reducing the amount of acres available for motorized travel off designated routes. Some native plant habitats within 300 ft. of roads open for motorized access for dispersed camping (MADC) could continue to have localized impacts, yet the proposed action incorporates **special** provisions within sensitive areas adjacent to streams, wetlands, and water bodies. The **special** provisions would limit motorized access to no closer than 30 ft. to the edge of the stream or water body. The proposed action also incorporates **special** provisions within known sensitive areas which have been identified within the non-riparian (upland) areas to limit motorized access to dispersed camping to *designated, defined* or *existing sites.*

Indicators of Effects:

- Acres open or closed to motorized access off designated routes and motorized access for dispersed camping that coincide with:
  - Native plants and their habitats identified by the Forest Plant Association Groups (PAGs)
  - Special or unique vegetation habitat types
  - Threatened, Endangered, or Sensitive plant populations
  - Other rare or uncommon plant populations

Invasive Plants

Motorized travel can transport invasive plant seeds and propagules and thereby create new areas of infestation. Areas disturbed by motorized recreation create habitat for invasive plants. The proposed action would reduce the potential for invasive plant spread and establishment as a result of substantially reducing the amount of acres available for motorized travel off of designated routes. However, areas already disturbed by motorized recreation will continue to be vulnerable to invasive plant establishment until these disturbed areas become re-vegetated. Under the Proposed Action, areas within 300 ft. of roads open for motorized access for dispersed camping will also continue to be vulnerable to invasive plants. However, limiting motorized travel solely for the purpose of ingress and egress into *designated*, *defined*, or *existing* dispersed campsites (**special** provisions) will help contain and possibly reduce the potential for invasive plant spread and establishment.

Indicators of Effects:

- Acres open/closed to motorized travel off of designated routes
- Acres of known invasive plant populations in areas open/closed to motorized travel off of designated routes
- Acres of known invasive plant populations in areas open/closed to motorized access for dispersed camping

Vegetation Treatments & Wildfire

Often in locations within the National Forest where wildfires have burned or where vegetation treatments (hazardous fuels, timber, and/or silvicultural) have occurred, forest vegetation and undergrowth densities have been reduced which can potentially make these areas more accessible to motorized access off designated routes, or to motorized access for dispersed camping. To augment this accessibility, most of the hazardous fuels treatments and many other vegetation treatments are located adjacent to existing open designated routes. The proposed action would likely reduce the opportunity for motorized access off designated routes in those areas where there is overlap between wildfires, treatments and proposed prohibitions on motorized access more than 300’ off of designated routes.

Since many vegetative treatments occur within 300’ of an open road, there would continue to be an opportunity for increased motorized access for dispersed camping within the those areas that have or are planned for vegetative treatments that would also remain or be proposed as “open” to motorized access for dispersed camping. However, there would likely be no change to the potential for motorized access for dispersed camping for those areas within 300’ of a designated route where motorized access for dispersed

camping would be allowed only to *designated, defined* or *existing* sites (**special** provisions) as a result of vegetation treatments or wildfires.

Indicators of Effects:

- Acres open/closed to motorized access off of designated routes which overlap planned vegetation treatments and/or fire areas
- Acres open/closed to motorized access for dispersed camping which overlap planned vegetation and/or fire areas

Wildlife

The proposed action would reduce the potential for vegetative wildlife habitat loss and disturbance from motorized vehicles as a result of changing where motorized use off designated routes is allowed and by modifying the conditions under which motorized access within 300' of an open road would continue. Motorized access off of designated routes has the potential to fragment, damage, or eliminate habitats or to disturb the use of some habitats due to noise or frequency of visits. Motorized use off designated routes is likely to have similar effects to motorized use on designated routes, except that use on designated routes is more likely to be concentrated and at higher speeds, while motorized use off of designated routes is likely to be more dispersed and at somewhat slower speeds. The proposed action would reduce the amount of area open to motorized access off designated routes and reduce the amount of disturbance to wildlife species and habitat.

Indicators of Effects:

- Acres of specific wildlife habitat:
- Disturbed (within 200m of open roads)
- Undisturbed (outside 200m either side of an open road)

Range Management and Livestock Grazing

The proposed action would beneficially change how motorized access for dispersed camping and motorized access off designated routes would affect grazing operations, rangeland plant associations, and range improvements. The proposed action would reduce damage to range improvements while improving grazing operations by increasing forage quantity and improving forage quality. The proposed action would indirectly reduce the spread and establishment of invasive plant species also benefiting rangeland plant associations which tend to be highly susceptible and sensitive to invasive plant infestation and invasion (see Invasive Plants section).

Indicators of Effects:

- Acres open or closed to motorized access off designated routes and motorized access for dispersed camping that coincide with:
- Open grazing allotments
- Closed grazing allotments

Fire Risk

The proposed action could potentially affect the location of unplanned human-caused fire starts associated with access by motorized vehicles and suppression forces. Although there are no statistics maintained specifically for fire starts associated with motor access, there are related categories that could be associated with the use of motorized vehicles off designated routes or with motorized access for dispersed camping. Those categories include equipment, smoking, campfires, debris burning, children, and unknown human-caused.

Indicators of Effects:

- Potential changes in the location of unplanned human-caused ignitions and proximity of those ignitions to suppression forces:
  - More than 300' off of an open designated route that are:
    - Proposed closed to motorized access for dispersed camping; or
    - Proposed closed to motorized access off designated routes
  - Within 300' of an open designated route

Air Quality

The proposed action would have no measurable direct or indirect effect to air quality since the net emissions from vehicles, vehicle travel, forest management activities, and wildfires are unlikely to change. There may be some increased temporary localized air quality impairment from vehicle emissions and fugitive dust in areas where there is currently a high level of non highway-legal vehicle use and within 300' of open designated routes since motorized access off designated routes will be restricted and motorized access for dispersed camping will be limited (to varying degrees). This increased temporary localized air quality impairment will likely increase with Forest use over time. However, this increased effect is assumed to be minimal because motorized use when dusty conditions are likely (late summer months) is not desirable and often discourages users.

Heritage Resources

Motorized use can potentially damage, destroy and/or displace cultural resources sites which are fragile and non-renewable. Some of the sites are especially vulnerable to off-highway vehicle use. The proposed action would reduce impacts to heritage resources by reducing the amount of acreage open to motorized vehicle traffic. The removal of motorized access off designated routes will generally have a beneficial effect on heritage resources by eliminating the physical disturbances that currently threaten heritage site integrity, whether in highly trafficked areas or in areas at risk of newly created routes. Areas subject to **special** provisions would further reduce the susceptibility of these sites, by eliminating the creation of new disturbance areas. Heritage resource sites that are currently impacted as a result of motorized access off designated routes would be expected to slowly recover over time due to reduction in erosion and eventual recovery of soils and re-growth of groundcover and understory vegetation.

Indicators of Effects:

- Acres open to motorized access of designated routes or open to motorized access for dispersed camping

Scenery

The Deschutes and Ochoco National Forest Land and Resource Management Plans identify Visual Quality Objectives for many Management Areas. These visual quality objectives are measured by the degree of change or alteration of the landscape with scenic views being most affected by actions that alter the form, line, color, and texture of the landscape. Motorized use off of designated routes or motorized access for dispersed camping can indirectly affect scenic quality by denuding vegetation, and causing visible "tracks" or "areas" that often alter the form, line, color, and texture of the landscape. This is generally most evident in foregrounds along popular use areas such as riparian areas or hill climb areas.

The proposed action would not directly alter the scenic views, but may indirectly benefit them. By limiting motorized access for dispersed camping in some areas to only *designated, defined* or *existing* campsites, visual impacts within view corridors would be reduced. Requiring a 30' setback from waterbodies and

stream channels would also facilitate vegetation recovery in these areas, thus providing a beneficial effect by contributing to the improvement of the foreground area seen adjacent to major forest roads.

Indicators of Effects:

- Acres within visual corridors limited to motorized access for dispersed camping to *designated, defined* or *existing* campsites

Issues Outside the Scope of the Proposed Action

The following comments or issues identified through comments were not considered significant issues because they are outside the scope of the proposed action; have been already decided by law, regulation, Forest Plan, or other higher level decision; may not be relevant to the decision to be made; or could be 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)…." A brief description of issues that were raised but were not classified as significant and the rationale for why they were considered to be outside the scope of the proposed action follows.

Identify a "minimum transportation system" as described in the Travel Management Rule.

Response: The agency responded to this comment when the Final Directives were published in the Federal Register on December 9, 2008 That response states, "Forest Service regulations at 36 CFR 212.5(b)(1) establish the requirement to identify the minimum road system on each administrative unit of the NFS, and Forest Service directives at FSM 7703.12 implement that requirement. Identification of the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of NFS lands under 36 CFR 212.5(b)(1) is separate from designation of routes and areas under 36 CFR 212.51. The requirement to identify the minimum road system was established in regulations (the roads rule) and directives (the *Roads Policy*) published on January 12, 2001 (66 FR 3216), before promulgation of the travel management rule in November 2005. Identification of the minimum road system focuses on the need for roads in the forest transportation system, rather than on appropriate motor vehicle use on routes in the forest transportation system and in areas on NFS lands." (Federal Register- Volume 73, No. 237/December 9, 2008 on page 74692)

Identify the original federal actions and decisions that established the existing designated road system.

Response: As noted by the Forest Service in the publication of the final directives for the Travel Management Rule, "The agency believes that it is not necessary or appropriate to require a comprehensive review of the forest transportation system when designating roads, trails, and areas for motor vehicle use per 36 CFR 212.51. Nothing in the travel management rule requires reconsideration of any previous administrative decisions that allow, restrict, or prohibit motor vehicle use on NFS roads and NFS trails or in areas on NFS lands and that were made under other authorities, including decisions made in land management plans and travel plans. To the contrary, the travel management rule provides that these decisions may be incorporated into designations for motor vehicle use (36CFR 212.50(b)). All national forests have a system of NFS roads open to motor vehicle use, and many also have a system of NFS trails managed for motor vehicle use. Some national forests have long restricted motor vehicles to designated routes under E.O. 11644, 36 CFR part 295, and FSM 2355. Other national forests have issued comprehensive travel management decisions that restrict motor vehicle use to designated routes and have issued orders that prohibit cross-country motor vehicle use. In these cases, the responsible official may, with public notice but no further analysis or decision-making, establish that decision or those decisions as the designation pursuant to 36 CFR 212.51, effective upon publication of an MVUM. In that situation, the only substantive change

effected by the designation would be enforcement of the restrictions pursuant to the prohibition in 36 CFR 261.13, rather than pursuant to an order issued under 36 CFR part 261, subpart B.[15]"

Closing existing designated roads currently open to motorized travel to all motorized vehicles or designating roads that have been closed to motorized vehicles as open to some or all classes of vehicles

Response: All of these issues are outside the scope of this proposed action, which is limited to identifying the existing designated road and trail system established by past administrative decisions and prohibiting motorized access off of those existing designated routes in accordance with the Rule (36CFR 212.50(b)) and establishing conditions for motorized access for dispersed camping within a specified distance adjacent to existing open designated routes as allowed by the Rule.

Designate all dispersed campsites

Response: Although the impacts of motorized access to dispersed camping are related to the actual dispersed campsite use, designating all dispersed campsites is an undertaking of a much broader and different scope than simply establishing conditions for continuing to allow motorized access for dispersed camping adjacent to existing designated open roads. Additional discussion of current programs and other strategies related to this issue is described under "Alternatives Considered but Eliminated from Detailed Study."

Expand areas available for motorized access for dispersed camping outside of the 300' buffer adjacent to designated routes.

Response: The maximum area that the Rule allows for motorized access for dispersed camping adjacent to open designated routes is 300 feet.

Determine where motorized and non-motorized use would be allowed across the landscape on all National Forest lands considering current trends and demands for non-motorized recreation.

Response*:* Decisions on where motorized access would or would not be an allowed under the provisions of the National Forest Management Act or other enabling legislation have been made by a variety of past federal actions and decisions including the Deschutes and Ochoco National Forest Land and Resource Management Plans. That kind of decision is of a very different scope and scale than the scope of this DEIS. The scope of the decision to be made here is whether to prohibit motorized use off of existing designated routes, and to establish the conditions under which motorized access for dispersed camping would be allowed rather than to re-examine past decisions about where motorized and non-motorized uses might be allowed now or into the future. None of the decisions made with this DEIS would preclude future consideration of this issue.

Prohibit non-highway-legal vehicles everywhere on the Deschutes and Ochoco National Forests

Response*:* This comment was addressed in the response to comments for the Travel Management Rule. That response was "National Forests are managed by law for multiple use. They are managed not only for the purposes stated in these comments, but for timber, grazing, mining, and outdoor recreation. These uses must be balanced, rather than one given preference over another." (Federal Register- Volume 70, No. 216/November 9, 2005 on page 68266)

[15] Federal Register- Volume 73, No. 237/December 9, 2008 on page 74692

"The Department recognizes this concern. Motor vehicles serve a variety of functions on National Forests. Motor vehicles are used in commercial and natural resource management activities, including maintaining utility corridors, mining, and timber sales.

Motor vehicles on NFS lands provide access to private land, recreation destinations, and destinations off NFS lands. Motor vehicles are used in support of other recreational activities, such as hunting and camping. Motor vehicles are also used as a recreational experience in their own right, such as for trail riding and driving for pleasure. These uses overlap and are not always clearly distinguishable. To create a comprehensive system of travel management, the final rule consolidates regulations governing motor vehicle use in one part, 212, entitled 'Travel Management.' Motor vehicles remain a legitimate recreational use of NFS lands."

(Federal Register / Vol. 70, No. 216 / pg 68272/Wednesday, November 9, 2005 / Rules and Regulations

On both forests, there are existing dispersed campsites that are or have been accessed by a motor vehicle, which are probably suitable for that type of access and are more than 300' from a designated system road. Exactly where all of these conditions exist is unknown. The proposed action could eliminate motorized access to these sites.

Response: Dispersed camping is very popular on the Deschutes and Ochoco National Forest, and is an important part of the recreation opportunities provided by these forests. Much of that use is tied to motorized access. The ultimate goal of the Travel Management Rule is to minimize impacts associated with motorized access, including motorized access for dispersed camping. The Rule allows for general motorized access for dispersed camping only within a specified distance from an open designated route - no more than 300 feet from the designated route. Other options anticipated when the Rule was put in place include developing designated routes to sites, or through a written permit. The 300' corridor considered in the proposed action is the maximum corridor width that can be accommodated within the Rule. The two Forests will continue to work toward a solution to this potential problem by considering sites that are identified outside of that 300' corridor to help identify what range of options may be suitable to address that issue.

Other Activities That Could Affect Motorized Access

This section briefly describes other activities that are currently ongoing within or near the planning area that could also have an effect on motorized access off designated routes or motorized access for dispersed camping in one or more of the Alternatives considered in detail. These include motorized trail projects in and around the central Oregon area that could change the amount or conditions of motorized access on designated routes; vegetation management projects that could create conditions more conducive to motorized access; and road management activities that could change the miles of designated roads available for motorized access or motorized access for dispersed camping.

Motorized Trails Projects

There are currently some ongoing proposals or recent decisions for designating motorized trail systems on the Deschutes, Ochoco, and Willamette National Forests and the Prineville District of the Bureau of Land Management that could affect recreational motorized access in the central Oregon area.

Deschutes and Ochoco National Forests

As part of the overall strategy to implement the Travel Management Rule, the Deschutes and Ochoco Forest Supervisors identified several potential areas to consider designating specialized motorized trails to help offset some of the motorized recreational opportunities that would no longer be available after the rule was implemented. These projects are going forward concurrently with this DEIS, although they are in different stages of planning. Only one of the proposed projects, Three Trails, is planned at this time to have a decision completed prior to or concurrent with the Record of Decision for the Travel Management Rule. Specific details about the location of proposed trails, staging areas, and associated road closures or limits on

motorized access for dispersed camping related to those decisions are not available at this time, but would be described in more detail in the Final EIS to Implement the Travel Management Rule.

A brief summary of the current status of each of those projects and a general time line for completing a decision follows. A map of the proposed project areas is included on CD 2 – Map of the Proposed Motorized Trail Systems.

Each of these projects is in a slightly different time frame. The Three Trails and Lava Rock OHV Trails projects, have proposed actions identified, and Alternatives to the proposed actions are currently being developed based on the issues identified during public scoping. The two other projects, Ochoco Summit and Meadow Lakes are not expected to have a proposed action developed prior to the release of this DEIS. For all four projects currently under development, a brief description of the scope of the project in its current stage of development and expected time frame for analysis and decision are summarized below.

Deschutes National Forest

- Three Trails
  - Area of consideration (project area) approximately 77,000 acres on the Crescent Ranger District on the southern end of the Forest.
  - 100- 150 miles of trails for all classes of vehicles in three "pod" areas (Junction, Two Rivers, and Walker), each with separate staging areas, connected by motorized "mixed" use roads
  - Focus on providing connections between rural communities
  - Anticipated time line:
  - Proposed action and scoping notice – January 2009
  - Draft EIS – Fall/Winter 2009
  - Final EIS/ROD – Spring 2010
- Lava Rock
  - Area of consideration (project area) includes approximately 144,000 acres on the Bend-Ft. Rock Ranger District in the central portion of the Forest.
  - Approximately 230 miles of motorized trails using separated and motorized "mixed" use roads and trails for all classes of vehicles linking with the East Fort Rock OHV Trail system
  - Anticipated time line:
  - Proposed action and scoping notice – Spring 2009
  - Draft EIS – Winter-Spring 2010
  - Final EIS/ROD – Fall 2010
- Meadow Lakes
  - Area of consideration (project area) is approximately 9,500 acres on the Sisters Ranger District
  - Primary focus is restoration of lakeside riparian areas and providing for appropriate dispersed camping sites including some motorized access for dispersed camping
  - Considering some limited links with Santiam OHV Recreation area on the adjacent Willamette National Forest and limited Class II trails, mainly to access dispersed camp sites.
  - Potential changes to the open road system.
  - No proposed action developed at present, completing feasibility assessments

Ochoco National Forest

- Ochoco Summit
  - Area of consideration (project area) includes approximately 164,000 acres
  - A proposed action has not been finalized, but is ongoing.
  - Intent is to provide a long, low-density motorized "mixed" use trail system looping the project area. Would also include some smaller loops and separated and motorized "mixed" use roads and trails for all classes of vehicles
  - Larger staging areas and smaller entrance areas would allow camping and multiple access points to the main trail system

- Some existing open motorized "mixed" use roads where the Travel Management Rule would allow motorized access for dispersed camping may be closed and converted to motorized trails.
- Anticipated time line:
- Proposed action and scoping notice, fall 2009
- Draft EIS, winter-spring 2009 – 2010
- Final EIS/ROD, summer-fall 2010

Willamette National Forest

Santiam Pass Summer Motorized Recreation Project

On October 8, 2008 the Willamette National Forest signed a Decision Notice on The Santiam Pass Summer Motorized Recreation Project. The Santiam Pass Summer Motorized Recreation Project is located on the McKenzie River Ranger District on the eastern edge of the Willamette National Forest. The project area has 68 miles of existing Forest roads with many dispersed camping sites located along road 2890 and the Santiam Wagon Road. The Santiam Wagon Road runs through the project area from east to west. Approximately 3.4 miles of the Pacific Crest National Scenic Trail (PCT) is situated along the east side of the project area. Other recreation sites in the project area include the Hoodoo Ski Area, Big Lake Campground, Big Lake West Campground, Big Lake Youth Camp and many dispersed camping areas.

The purpose of this project was to develop and implement formal management of motorized use in the project area. The Santiam Summer Motorized Recreation Project will provide approximately:

- 28 miles of open roads to motorized "mixed" use
- 4.5 miles of trails that will be open to Class I and III only
- 2.5 miles of trail that will be open to class I, II, and III
- 8 miles of roads that will be converted to motorized trails
- 9 miles of roads that will be open to highway-legal vehicles

There are a few roads located within the project area that extend onto the Deschutes NF. The effect this would have on the final implementation of the rule was discussed in the Decision Notice.

The Decision Notice states that the roads connecting to the Deschutes NF may be changed upon completion of the Travel Management Planning decisions on the Deschutes NF. Their document states that the decisions by the Deschutes NF will directly influence what the appropriate connections and use will be. The roads they are describing are the following:

- Road 2690-920, extending to trail 3558 leading east out of Ray Benson, will be closed to all motorized use pending the decisions by the Deschutes National Forest on their Travel Management Planning process.
- Road 2690-910 extending east to the Deschutes NF boundary will be closed to motorized "mixed" use until the Deschutes NF completes their Travel Management Planning process.
- Going south from Ray Benson Sno-Park on road 2690-920 extending to road 2690-940 which leads to the Santiam Wagon Road (SWR) will be left open to motorized "mixed" use.

The Deschutes National Forest is not designating new routes as a part of the implementation of the Travel Management Rule. The proposed action considered in this DEIS does not propose to open or close any existing designated system roads; therefore, none of the Alternatives considered in this DEIS would change the current condition of any designated system roads connecting to the Willamette National Forest. However, the Meadow Lakes project, which is in a very preliminary planning stage, would take a closer look at the designated motorized system adjacent to Santiam OHV Area during the development of the project.

More about the Santiam Summer Motorized Recreation Project may be found at the following website: http://www.fs.fed.us/r6/willamette/manage/nepa/current_mckenzie.html

Bureau of Land Management – Prineville District

Cline Buttes Special Recreation Area Transportation and Access Management Plan

The Cline Buttes project lies between the Crooked River National Grassland and the Deschutes National Forest and encompasses about 10,000 acres of public lands surrounded by rural residential lands in Deschutes County. The project proposes to provide a mix of motorized, non-motorized, and shared use trails within the project. The proposed project is planned to be submitted for a 30-day public comment review in the fall of 2009.

Vegetation Conditions that may Affect Motorized Access

National Forest lands where wildfires have burned or where vegetation treatments (hazardous fuels, timber, and/or silvicultural) have occurred that reduce forest and undergrowth densities may also have the indirect effect of making these areas more accessible to motorized access off designated routes, or to motorized access for dispersed camping. Most of the hazardous fuels treatments and many other vegetation treatments are located adjacent to existing open designated routes. The proposed action would likely reduce the opportunity for motorized access off designated routes in those areas where there is overlap between wildfires, treatments and proposed prohibitions on motorized access more than 300' off of designated routes. Since most vegetative treatments occur within 300' of an open road, there would continue to be an opportunity for increased motorized access for dispersed camping within the those areas that have or are planned for vegetative treatments that would also remain or be proposed as "open" to motorized access for dispersed camping. However, there would likely be no change to the potential for motorized access for dispersed camping for those areas within 300' of a designated route where motorized access for dispersed camping would be allowed only to *designated, defined* or *existing* sites (**special** provisions) as a result of vegetation treatments or wildfires. Appendix B-4.3 includes a list of project or planning area names and the NEPA documents under which most acres were treated from 2004 to 2008 that could create conditions that are more conducive to motorized access, and thus effect what areas might be more available to motorized access off of designated routes in Alternative 1, or affect what areas might be more accessible to motorized access for dispersed camping in Alternatives 2 and 3.

Road Management Activities

Roads and Travel Analyses

On January 12, 2001 the Department of Agriculture published its final rule and policy regarding the national forest transportation system. This *Roads Policy* was intended to ensure that the National Forest Road System meets current and future land and resource management objectives; provides for public uses of NFS lands; allows for economical and efficient management; and minimizes and begins to reverse adverse ecological impacts associated with the current transportation system. The policy required a forest-wide roads analysis be completed on all administrative units in the Forest Service by January 12, 2003.

The *Roads Policy* required the use of a science-based road analysis process to identify needs, issues, and opportunities related to the road system, and to document the information and analyses used to help identify the optimum road system needed for safe and efficient travel for the administration, utilization, and protection of NFS lands. The document *Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (USDA Forest Service, 1999, Misc. Report FS-643)* was developed and published in 1999 to provide guidance and direction in conducting the analysis.

The Ochoco and Deschutes National Forests completed the Forest-Wide Roads Analysis in January 2003, as required by the *Roads Policy*. This analysis was focused on broad-scale issues such as determining the minimum set of roads needed to provide public access for low-clearance passenger cars compared to roads that only need to be maintained for high-clearance vehicle use. Due to the broad-scale nature of the analysis only the main roads on the forests were analyzed. These consisted of all the arterial and collector roads on the forests as well as any local roads maintained for low-clearance passenger car use.

Roads analysis below the forest scale was not automatically required, but could be undertaken at finer scales (watershed or project level) to support site-specific transportation decisions. The *Roads Policy* required that any decisions resulting in a change in public access or that may result in adverse effects on soil and water resources, ecological processes or biological communities, must be informed by a roads analysis. The Responsible Official has the discretion to determine whether there is sufficient information in the Forest-Wide Roads Analysis to inform a given decision or whether additional information was needed through a finer scale analysis.

One of the requirements in the *Roads Policy* was to determine the minimum road system necessary for safe and efficient travel for administration, utilization, and protection of NFS lands. One element in determining the minimum road system is to identify unneeded roads. Since it was not practical to analyze all the local roads that are not maintained for low-clearance passenger car use (maintenance level 1 & 2) during the Forest-Wide Roads Analysis, many project level roads analyses have been conducted since 2003 in order to determine this "minimum" road system.

For each project area on a Ranger District that may involve road management activities such as road construction, reconstruction, or changes in public access, a project-level roads analysis is conducted by the local interdisciplinary (ID) team. During the project-level roads analysis, each road in a watershed or planning area is evaluated by the ID team to determine if it is needed or not. If it is determined the road is not needed, a recommendation is made whether to decommission or convert the road to another use such as a trail. If it is determined that a road is needed, another recommendation is made as to whether it needs to be open year-round, open seasonally, or closed between project uses (maintenance level 1). In addition, other recommendations are made, depending on the type of use expected and resource concerns identified, as to any type of improvement work that may be needed for the road such as improved surfacing or drainage features. This list of recommendations is used to help formulate proposed actions within specific project areas, and for use by the Responsible Official when making decisions involving road related activities. These recommendations are also used by ID teams when looking for opportunities to reduce open road densities to reflect Forest Plan Standards and Guidelines in areas of high road densities, or to mitigate effects of vegetation management decisions.

The 2005 Travel Management Rule has incorporated much of direction from the *Roads Policy (2001)*, but has changed terminology to reflect the analysis of trails as well as roads. For example, the roads analysis process is now called the travel analysis process. A Travel Analysis is required to inform decisions related to travel management activities such as adding or removing roads and/or trails from the transportation system, constructing roads and/or trails, and decommissioning roads and/or trails. A Travel Analysis is also required for designation of roads, trails, and areas for motor vehicle use for any project issuing a proposed action after January 8, 2009.

Road Management Decisions

As mentioned above, the Ochoco and Deschutes National Forests have been working toward identifying the minimum road system necessary for safe and efficient travel for the administration, utilization, and protection of the National Forests for several years now through the use of project scale roads and travel analyses. Many of the recommendations of these analyses have been incorporated into NEPA decisions and the resulting road closures and decommissioning projects have been implemented by signing, barricading, or subsoiling these roads. Table 2-1 – Road Management Decisions 1990-2009, displays the miles of road closures and decommissioning incorporated into several decisions under the provisions of the National Environmental Policy Act on the Deschutes and Ochoco National Forests. Since the early 1990s, NEPA decisions have been made to either close (identify as maintenance level 1) or decommission over 1,200 miles of roads on the two Forests. On the Deschutes National Forest, approximately 77% of that total has occurred since 2000, while on the Ochoco National Forest approximately 76% of their total road closures and decommissioning decisions occurred in the 1990s.

Table 2-1: Road Management Decisions: - 1990-2009

Deschutes National Forest	**1990-2000**	**2001-2009**	**Totals**
Close	216.2	370.7	586.9
Decommission	31.5	469.2	500.7
Total	247.7	839.9	1087.6
Ochoco National Forest and Crooked River National Grassland	**1991-2000**	**2001-2009**	**Totals**
Close	194.7	39.3	234
Decommission	30.9	32.4	63.3
Total	225.6	71.6	297.2

Roads that have an approved decision to be closed or decommissioned, but have not had necessary storage or decommissioning maintenance activities completed to clearly identify the road as closed to the public, would not be shown on the Motor Vehicle Use Map. As a result, those roads could potentially have the decisions to close them implemented more quickly than in the past. Other projects that may involve road storage or decommissioning are ongoing concurrently with this DEIS on each Ranger District. These ongoing decisions could affect what roads would be designated as open to motorized use considered in this DEIS, as well as the areas that would be open to motorized access for dispersed camping.

CHAPTER 2. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

Introduction

This chapter describes and compares the alternatives considered for the Travel Management DEIS for the Deschutes and Ochoco National Forest and the Crooked River National Grassland. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, 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 (i.e., acres open to motorized access for dispersed camping) and some of the information is based upon the environmental, social and economic effects of implementing each alternative (i.e., miles of road open to highway and non-highway-legal vehicles).

Understanding this Chapter

The area covered by the proposed action is over 2 million acres[16] and the current management direction related to motorized access is quite complex. This chapter has been organized to present this information so that people can understand what the current direction is and what is or is not changing as a result of these proposed actions. The following paragraphs summarize the information presented in each of the major sections: –

Maps of the Alternatives

This section of the chapter will include a short description of what each of the "Alternative" maps illustrate, how and where to view them, and a brief description and reference to a sample of the Motor Vehicle Use Map. The Alternative Maps are used to illustrate the existing condition and proposed changes. The sample Motor Vehicle Use Map will give people a chance to see what the final "official" map to be distributed to the public will look like.

Motorized Access Not Affected by the Proposed Action

This section is a description of the current management direction related to motorized access that would not be changed by the proposed action or alternative.

Alternatives Considered in Detail

Alternative 1 - No Action/No Change - The No Action Alternative describes the current management direction related to motorized access off of designated routes and motorized access for dispersed camping as it exists today.

Alternatives 2 and 3:

1. *Proposed Actions Common to Alternatives 2 and 3* - This section describes the proposed actions that would be the same for Alternatives 2 and 3.
2. *Connected Actions Common to Alternative 2 and 3* – This section describes the Forest Plan Standards and Guidelines that would be amended and public use restrictions that would be rescinded or modified as a result of this decision. These actions are considered connected actions under the Council of Environmental Quality's regulations for implementing the

[16] Total acreages may vary slightly between specialist reports due to differences between individual sources and/or databases used to calculate or obtain the acres (ie, differences in Forest Service databases such as GIS, INFRA and FACTS)

National Environmental Quality Act, and are a part of the proposed actions considered in this DEIS.

3. *Alternative 2* – The primary differences between Alternative 2 and 3 are how motorized access for dispersed camping is provided across the two Forests. This section describes the actions proposed for motorized access for dispersed camping that are unique to only Alternative 2.
4. *Alternative 3* - This section describes the actions proposed for motorized access for dispersed camping unique to only Alternative 3.

Alternatives Considered but Eliminated from Detailed Study

This section describes Alternatives to the proposed action that were considered as a result of comments received on the proposed action, but were not analyzed in detail in this DEIS and the rationale for why they were not considered in detail.

Comparison of the Alternatives

This section displays the key differences for motorized access between taking no action (Alternative 1), the proposed action (Alternative 2), and the alternative to the proposed action (Alternative 3) in tabular form.

Maps of the Alternatives

The following hardcopy maps are included in Appendix A

5. A-1 - Black and white overview maps of the Alternatives (fold-out – 11 x 17)
6. A-2 – Color maps of the proposed changes to Motorized "Mixed" Use Roads
7. A-3 – Color maps of the Inventoried Roadless Areas

The detailed maps of the alternatives are included with hard copy versions of this document in an electronic format on a compact disk, or on the Deschutes and Ochoco National Forest's website (http://www.fs.fed.us/r6/centraloregon/travel-mgmt/index.shtml). Printed copies will also be available for on-site review at each of the Ranger District and Headquarters offices for the Deschutes and Ochoco National Forest and the Crooked River National Grassland, as well as the Redmond Air Center.

The Alternative Maps are divided into two major categories of motorized access to help understand the alternatives. These are "Motorized Access Off Designated Routes," and "Motorized Access for Dispersed Camping."

Maps of Motorized Access Off Designated Routes

There are two maps that display the existing condition and proposed actions related to motorized access off designated routes. These maps are displayed at a two-forest scale and illustrate the current and proposed conditions for motorized access on or off designated routes.

Alternative 1 – Motorized Access Off Designated Routes – CD 1-Map 1

Displays the current management direction for motorized access off designated routes, areas closed to all motorized access, areas closed to off-highway vehicle access, seasonal use areas, and roads open year-round for the Deschutes and Ochoco National Forests and Crooked River National Grassland.

Alternatives 2 and 3 – Motorized access off designated routes –CD 1- Map 2
Displays the areas where there would be no change for motorized access off designated routes (continued existing condition), and the proposed changes for motorized access off designated routes that would

implement the Travel Management Rule for the Deschutes and Ochoco National Forests and Crooked River National Grassland.

Maps of Motorized Access for Dispersed Camping

There are several maps that display the existing and proposed actions related to motorized access for dispersed camping. These maps are displayed at about a 2 inch/mile scale for each of the Ranger Districts. For each Ranger District there are three maps – one for each Alternative (except the Bend-Ft Rock District on the Deschutes National Forest which has an east and west side for a total of six maps). These maps display the areas currently open to motorized access for dispersed camping, and the proposed changes, including areas where "**special** provisions" would apply.

Alternative 1 – Motorized Access for Dispersed Camping CD 1- Maps- 3.1; 4.1; 5.1; 6.1; 7.1; 8.1; 9.1

Displays the existing condition for motorized access for dispersed camping, including areas that currently prohibit such access, or allow motorized access for dispersed camping only to *designated* sites. Displays the designated NFS roads and motorized trails (not including snowmobile trails) open year-round or seasonally for each of the six ranger districts on the Deschutes and Ochoco National Forests and the Crooked River National Grassland. Displays the location of developed recreation sites and designated non-motorized trail systems.

Alternative 2 –Motorized access for dispersed camping - CD 1- Maps- 3.2; 4.2; 5.2; 6.2; 7.2; 8.2; 9.2

Displays the areas that would be closed to motorized access for dispersed camping; where motorized access for dispersed camping would continue as "open" under the **general** provisions, either year-round or seasonally; and where areas would be proposed to be open to motorized access for dispersed camping, under **general** or **special** provisions, either year-round or seasonally. Displays the designated roads and motorized trails open to motorized use for highway-legal and non-highway-legal vehicles either year-round or seasonally. Displays the location of developed recreation sites and designated non-motorized trail systems

Alternative 3 – Motorized access for dispersed camping - CD 1- Maps- 3.3; 4.3; 5.3; 6.3; 7.3; 8.3; 9.3 -

Displays the conditions that would be the same between Alternatives 2 and 3 for motorized access for dispersed camping. Displays the areas that would be open to motorized access for dispersed camping subject to "**special** provisions" in Alternative 3.

Alternatives 1-3 Map Listing by Unit

8. Deschutes National Forest
    1. Sisters Ranger District – CD 1- Maps- 3.1 – 3.3
    2. Bend-Ft. Rock Ranger District
        1. West Side – CD 1- Maps- 4.1 – 4.3
        2. East Side – CD 1- Maps- 5.1 – 5.3
    3. Crescent Ranger District – CD 1- Maps- 6.1 – 6.3
9. Ochoco National Forest
    1. Crooked River National Grassland – CD 1- Maps- 7.1 – 7.3
    2. Lookout Mountain Ranger District – CD 1- Maps- 8.1 – 8.3
    3. Paulina Ranger District – CD 1- Maps- 9.1 – 9.3

Sample Motor Vehicle Use Map

A sample of the Motor Vehicle Use Map is included in CD 2-Sample Motor Vehicle Use Map. This sample provides a preview of what the final map will look like that will be available free of charge to the public. Please note that, although the Maury Mountains were used as the base map to illustrate the symbology of the Motor Vehicle Use Map, **this sample is not meant to provide an accurate reflection of the motorized access conditions of the proposed action or alternatives.** The sample map has been adjusted so that most of the symbology a user may find across the Forest's maps are demonstrated in the sample.

The final Motor Vehicle Use Map is the official map that will show where and under what conditions motorized access on the Deschutes and Ochoco National Forests and the Crooked River National Grassland will be allowed in accordance with the Travel Management Rule. The map includes two essential parts. Part one is a black and white map that shows what routes and areas are open for motorized access and what areas are open to motorized access for dispersed camping. Part two are detailed tables on the back of the map that explain any special condition of use for designated routes, such as the season of use. The tables also show the conditions of motorized access for dispersed camping that apply to some or all routes. Since the Motor Vehicle Use Map is required to be printed in Black/White, it will look quite different than the full color Alternative Maps included in the DEIS. This sample map is included to give people an idea of what the final map will be like to use to determine where motorized access is allowed.

Motorized access not affected by the proposed action

There are some past decisions about motorized access that would not be affected by this proposed action or alternatives. Past administrative decisions that have established seasons of use for specific areas (not including proposed Forest Plan amendments), designated motorized routes (roads and trails) or areas, or closed or decommissioned Forest roads would not be changed by any alternatives considered within the scope of this proposed action. The Travel Management Rule allows for some exclusion or exemptions for motorized access, such as over snow or water, as otherwise authorized by permit, and for administrative or emergency access not affected by this decision. The kinds of motorized access not affected by the decision in this DEIS are briefly summarized below.

Exemptions or Exceptions Identified by the Travel Management Rule

There are several categories of motor vehicles and uses exempt from the prohibitions of the Travel Management Rule[17]. The motorized access for these types of vehicles or uses would therefore not be directly affected by this decision include:

- Aircraft
- Watercraft
- Over-snow vehicles[18]
- Limited administrative use by the Forest Service
- Use of any fire, military, emergency, or law enforcement vehicle for emergency purposes
- Authorized use of any combat or combat support vehicle for national defense purposes
- Law enforcement response to violations of law, including pursuit
- Motor vehicle use that is specifically authorized under a written authorization issued under Federal law or regulations[19]
- Use of a road or trail that is authorized by a legally documented right-of-way held by a State, county, or other local public road authority

Native American Treaty Rights

The traditional, treaty and ceded lands of three federally recognized tribes overlap the two national forests and Crooked River National Grassland. These tribes consist of: The Confederated Tribes of the Warm Springs of Oregon (Warm Springs Tribe), The Klamath Tribes and the Burns Paiute Tribe. However, of the three, the Warm Springs Tribe is the only tribe with ceded land treaty rights as per the 1855 Treaty with the

[17] Federal Register, Vol.70, No.216, pps. 68291

[18] Designating routes and areas for over-snow vehicles is optional under the Travel Management Rule. The Deschutes and Ochoco National Forests are not including any new requirements.

[19] This includes permitted activities such as firewood cutting, commercial and personal use mushroom gathering, Christmas tree cutting, and other approved permitted activities where a motor vehicle may be used under the conditions of the permit.

Tribes of Middle Oregon. The Klamath Tribes' former reservation is now part of the Fremont-Winema National Forest, and their aboriginal territory includes parts of the Deschutes National Forest as well. The Burns Paiute Tribe, while federally recognized has neither a formal reservation nor ceded lands on the national forests, however their traditional territory includes portions of both forests and the grassland. It is well known and documented that those members of the Warm Springs Tribe continue to exercise their ceded land treaty rights on the grassland and both national forests, mostly in the harvest and collection of traditional foods, such as roots, lichens and berries. The Crooked River National Grassland and Ochoco National Forest has mapped areas where traditional use is known to occur and they have coordinated with the Warm Springs Tribe on their First Foods initiative to preserve and maintain traditional cultural uses and their habitats. While they are less well known and documented, anecdotal evidence exists of traditional and ceremonial uses of public lands by members of the Klamath Tribes and Burns Paiute Tribe. However, the locations and details of these practices are unknown at this time. In general, under ceded land treaty rights, AIRFA and the Sacred Sites Act, the Forest Service cooperates with Tribes and individual practitioners to assure access to and use of public lands for said purposes and exercise of these rights would not be affected by this action.

Categories of Existing Use

As stated earlier, the purpose of the Travel Management Rule was to develop and enforce a consistent nationwide approach of allowing motorized access on National Forests and Grasslands. Due to the differences between the two National Forests, their respective Land Management Plans and their management objectives there are currently several different management directives on the two Forests relating to motorized access. Sometimes management objectives and/or decisions addressed motorized access as it related to off-highway vehicles, but not motorized access for dispersed camping, or visa versa. The following paragraphs describe in further detail different categories of these management directions.

Designated Routes and Areas Open to Motorized Access

There are approximately 8,024 miles of existing designated roads, 370 miles of existing designated motorized trails, and approximately 1,286[20] acres of designated areas included in existing designated motorized trail systems on the two Forests currently open to motorized access by either highway or non-highway-legal vehicles or both. Designated motorized trail systems have established specific classes of non-highway-legal vehicles allowed on motorized trail systems. These existing designations would not be affected by this decision.

Areas with Seasonal Motorized Uses

Seasonal use periods for motorized access on designated roads have been established across the two Forests by past administrative actions to protect a variety of resources or to provide quality hunting experiences. With the exception of minor seasonal use period adjustments included in the proposed Forest Plan Amendments, existing seasonal use periods on designated routes would not be affected by this decision.

Areas Closed to <u>All</u> Motorized Access

There are approximately 198,908 acres on the Deschutes and 74,465 on the Ochoco National Forest that currently prohibit <u>all</u> motorized access, with no exceptions for motorized access for dispersed camping, that would not be affected by this decision (See Table 3 – Acres of Motorized Access off Designated Routes and reference footnote). Areas that would not be affected by this decision are primarily Wilderness Areas, but also include areas where motorized access is restricted or prohibited by other orders or past decisions and where there are no open designated routes, such as Research Natural Areas and some Old Growth Areas on

[20] Because the actual area of these sites is geographically small, they are represented on the maps and in the calculated acres based on a ¼ mile circle that is roughly in the location of the areas currently open to motorized access off designated routes within existing designated trail systems. This may represent a larger area than is actually designated on the ground and is only meant to illustrate the general location of the sites and relative acreage. Detailed maps of the designated motorized trail systems are available that more accurately depict the designated areas of the campgrounds, staging and other open areas within the current designated motorized trail systems.

the Ochoco National Forest. An additional 13,525 acres currently closed to motorized access off designated routes under a temporary public motorized use restriction in the McKay Creek area, would remain closed except to be modified to allow for motorized access for dispersed camping by the proposed action.

Areas Closed to OHV Access

There are approximately 59,412 acres on the Deschutes National Forest that currently prohibit off-highway vehicle use on and off of designated motorized routes. Forest Plan direction that currently specifically prohibits OHV use within a particular management area would not be affected by this decision. (See Table 3 – Acres of Motorized Access Off Designated Routes). The Ochoco NF does not have a similar prohibition.

Areas Closed to Motorized Access Off Designated Routes

There are approximately 729,187 acres on the Deschutes National Forest and approximately 204,081 acres on the Ochoco National Forests that currently prohibit motorized or off-highway vehicle access off designated routes or within specific areas that would not be affected by this decision. (See Table 3 – Acres of Motorized Access Off Designated Routes)

Areas Closed to Motorized Access for Dispersed Camping

There are approximately 202,727 acres on the Deschutes National Forest, approximately 31,665[21] acres on the Ochoco National Forest, and 77,546 acres on the Crooked River National Grassland that are currently closed to motorized access for dispersed camping. This designation would remain in place and would not be affected by this decision.

Alternatives Considered in Detail

The Forest Service developed one alternative to the Proposed Action, for a total of three alternatives, including the No Action/No Change. There are two recurring terms and concepts of the proposed action and alternatives that are helpful to understand when looking at the maps and reading the descriptions of the alternatives. The first is “Motorized Access off Designated Routes,” and the second is “Motorized Access for Dispersed Camping.” The first concept refers to what might commonly be known as “cross-country travel,” while the second refers specifically to driving off a road to camp outside of a developed campground. The maps and alternative descriptions will be organized to provide summaries of how these two aspects of motorized access are affected by the proposed action and alternatives.

Alternative 1: No Action/ No Change

The No Action Alternative is included as a baseline comparison of continuing the existing conditions without implementing the proposed actions as required by the CEQ Regulations (40 CFR 1502.14). The No Action/No Change Alternative would not implement any changes in the current management direction on the Deschutes and Ochoco National Forest regarding motorized access. The Forests would not publish a Motor Vehicle Use Map at this time, but would continue to enforce existing designations and restrictions according to past travel management maps and site-specific decisions. Alternative 1 would continue to allow motorized travel[22] where it is not already restricted or prohibited by law, regulation, policy, order, Forest Plan direction, site-specific decision or agreement[23]. Motorized access on designated roads would continue as currently authorized. There would be no change at this time to existing designated routes for the class of vehicle that could use the routes. There would be no Forest Plan amendments to change motorized access off designated routes or to change motorized access for dispersed camping as a result of this decision.

[21] These numbers are calculated from GIS data based on those acres noted on Alternative 2 maps as Continued Existing, Closed to Motorized Access for Dispersed Camping.
[22] Over the snow vehicles are excluded from this proposed action
[23] This includes past decisions to close or decommission National Forest system roads that may not have been implemented through physical barriers or signing, or where the closure method was limited to not conducting routine maintenance activities

Motorized access for dispersed camping would continue to be allowed as provided for by current laws, regulations, policies, Forest Orders, Forest Plan direction, or site-specific decisions. Alternative 1 would continue to allow, unless specifically determined otherwise by a separate decision, motorized access off of designated routes for a variety of types of vehicles on approximately 625,430 acres either year-round or seasonally on the Deschutes National Forest; and on about 431,784 acres on the Ochoco National Forest. This Alternative would not be consistent with Forest Service regulation and policy to publish a Motor Vehicle Use Map that would show designated routes by class of vehicle and season of use and prohibit motorized access off of designated routes.

Alternatives 2 and 3

Proposed Actions Common to Alternatives 2 and 3

Motorized Access Off Designated Routes

Areas Closed to Motorized Access Off Designated Routes

The Deschutes and Ochoco National Forests and the Crooked River National Grassland propose to prohibit all motorized travel off of existing designated routes or outside of existing or proposed designated areas subject to the motorized vehicle and use exceptions previously described and allowed for by the Rule. These are subject to the conditions identified for motorized access for dispersed camping. This would include all areas that currently do not prohibit motorized use off designated routes or areas or are not otherwise permanently restricted or prohibited for such use by law, regulation, policy, order, Forest Plan direction, or other site-specific decision or agreement. The areas that would be closed to motorized access off designated routes and those areas that are currently closed to motorized access off designated routes are shown on CD – 1 –Alternatives 2 and 3 – Motorized access off designated routes. All routes and areas open to motorized access, including conditions of use, will be displayed on the Deschutes and Ochoco National Forest Motor Vehicle Use Map (MVUM) and associated tables. This map will be prepared in accordance with national management direction and will be available to the public free of charge. A sample of this map is included on CD-2 DEIS Map– Sample Motor Vehicle Use Map for the Deschutes and Ochoco National Forests.

These proposed actions common to both Alternatives 2 and 3 would prohibit motorized access off designated routes on approximately 1,611,862 acres on the Deschutes and 723,644 acres on the Ochoco National Forest. (See Table 3 – Acres of Motorized Access Off Designated Routes)

Areas Designated Open to Motorized Access Off Designated Routes

There are several rock/cinder pits currently open to use by off-highway vehicles as “play” areas that are not within a designated motorized trail system. These areas are proposed to be designated as areas “open to motorized access off designated routes” within defined boundaries in both Alternative 2 and 3. In determining whether to continue to allow this use, the Forest Service considered the following criteria:

- Dedicated use to mineral material source extraction
- Current level of use by non-highway-legal vehicles
- Accessibility by designated roads open to non-legal vehicles
- Proximity to a projected and/or existing Class I, II or III route
- Access to designated trails
- Potential staging areas for proposed trail systems
- Definable motorized use boundary
- Safety
- Mineral material source activity
- Separation of mineral extraction and recreational activity
- Mine Safety and Health Administration (**MSHA**) standards

- Backslopes and exposed faces
- Hazardous materials
- Other recreational uses of mineral material sources
- Target shooting
- Potential Conflicts
- Proximity to residential areas
- Surrounding land ownership, allowable uses
- Consistency with seasonal and/or other use restrictions
- Presence of unique or special habitats
- Changes in sensitive species requirements or seasonal use periods
- Presence of Invasive Plants

Based on these criteria, approximately 160 acres of existing mineral material sources (33 rock/cinder pits) for the Deschutes National Forest and 191 acres for the Ochoco National Forest (22 rock/cinder pits) will remain open under both Alternatives 2 and 3. These areas would continue to be "open to motorized access off designated routes" within the defined boundaries of the rock/cinder pits following approval by the Forest Supervisor of an invasive plants treatment plan. These areas are illustrated on the individual unit maps for each alternative[24].

Motorized Access for Dispersed Camping

*Limited Use Conditions (**general** and **special** provisions) for Motorized Access for Dispersed Camping*

Both Alternative 2 and Alternative 3 would continue to allow motorized access for dispersed camping in within 300' of most open designated roads on the Deschutes and Ochoco National Forests. This allowance is in accordance with CFR 212.51 "… the responsible official may include in the designation (of routes) the *limited use* (emphasis added) of motor vehicles within a specified distance of certain designated routes, and if appropriate, within specified time periods solely for the purpose of dispersed camping….". Alternatives 2 and 3 would modify the conditions for motorized access within 300' of an open designated route to incorporate the **general** provisions for motorized access on designated routes identified in the Travel Management Rule and to include **special** provisions that would further limit the use of motor vehicles in certain areas. These conditions can be summarized as follows:

General provisions: For routes designated as "open to motorized access for dispersed camping" the following provisions would apply for 300' adjacent to the designated open route:

- Motorized access would be allowed solely for the purpose of dispersed camping.
- The motor vehicle used for ingress and egress for dispersed camping must be the same "class" (highway-legal or non-highway-legal) of vehicle allowed on the adjacent designated route from which the vehicle is accessing the dispersed campsite.
- Motorized access for dispersed camping would be allowed only during the open season of use for the designated road within 300' of the centerline of the road
- Motorized access for ingress and egress to a campsite in any area would **not** be allowed to:
- cross any streams, wetlands or water bodies unless on a designated NFS route
- otherwise result in unreasonable resource damage to access the campsite with a motor vehicle.

[24] Because the actual area of these individual sources is geographically small, they are represented by a ¼ mile circle that is roughly in the location of the mineral material source (rock/cinder pits). This represents a larger area than would actually be designated on the ground and is only meant to illustrate the general location of the sites. More detailed maps are included in Appendix B-2.2 – Mineral material sources – proposed open to motorized access off designated routes

Special Provisions: Limited motorized access for dispersed camping would be applied to all open designated routes within 300' of a stream course, wetland, or waterbody in both Alternatives 2 and 3; and would vary by alternative in when they would apply to non-riparian (upland) routes.

- Routes with "**Special** Provisions" would limit motorized access for dispersed camping according to the following conditions in addition to those already identified:
- Motorized access for dispersed camping would only be authorized to *designated*, *defined*, or *existing* dispersed campsites. (See Figures 2-4)
- Motorized access for dispersed camping to an "*existing*" site would **not** be allowed closer than 30 feet of a stream, wetland, or other water body. (See Figure 5)

Criteria for Special Provision Areas or Areas Closed to Motorized Access for Dispersed Camping Within 300 Feet of Open Designated Routes

How and under what conditions motorized access for dispersed camping should be provided across the Forests under the new Travel Management Rule were considered by several people during the planning process. Most people that participated in the process prior to developing the proposed action, including the federal advisory committee that provided recommendations on how to implement the Rule, and people that commented after the proposed action was developed, agreed that there were some locations with greater sensitivity to motorized access for dispersed camping than others where **special** provisions or prohibitions should be considered. A set of criteria were initially developed by a Forest Service ID team and subsequently included in the Deschutes PAC's recommendations for implementing the Travel Management Rule. The criteria used by the Deschutes and Ochoco National Forest was developed from that initial list and modified by the Forest Service based on further review and consideration of the comments provided by the public and the PAC in their final recommendation.

The following criteria is proposed, in both Alternatives 2 and 3, to be the basis for current and future considerations of where temporary or permanent **Special** Provision or Prohibited areas would be identified for motorized access for dispersed camping within 300 feet of an open designated route.

- Open routes adjacent to sensitive or restricted areas include but are not limited to:
- Congressionally Designated Areas such as Wilderness, Newberry National Volcanic Monument, Wild and Scenic Rivers
- Areas or routes currently under or subject to Agreement, Forest Plan, or Forest Code of Federal Regulation (CFR) temporary, seasonal, or permanent closure orders or other NEPA decisions.
- Riparian, wetland, or other identified sensitive resource area such as Forest Service Sensitive, Threatened and Endangered Species habitats, erosive soils or unsuitable topography
- Special resource management areas such as restoration or rehabilitation areas, invasive plant populations, day use only areas, developed recreation sites, experimental forests, or roadless areas
- Areas under Special Permit such as resorts, ski area developments, observatories, or special recreation events
- Open high speed or high density travel routes including but not limited to:
- State Highways, Major Federal[25], State, or County Arterials and Collector Roads
- Federal or State Scenic Byways
- Routes that access popular or high density recreation facilities
- Routes that access population centers

Areas Proposed to be Closed to Motorized Access for Dispersed Camping

Alternatives 2 and 3 would have in common areas proposed to be closed to motorized access for dispersed camping that are currently open to motorized access for dispersed camping. This would close approximately

[25] National Forest System Road - Maintenance level 3-5

794,722 additional acres on the Deschutes National Forest, and about 415,834 acres on the Ochoco. (See Table 4 – Acres of Motorized Access for Dispersed Camping, comparing Alternative 1, 2 and 3)

Most of these prohibitions are located beyond the 300' area adjacent to existing open roads where motorized access for dispersed camping is generally proposed to be continued. However, there are some areas currently open for motorized access for dispersed camping that would be closed to motorized access for dispersed camping under both Alternatives 2 and 3. These areas are illustrated on the Alternative 2 – Motorized Access for Dispersed Camping maps. A detailed list of the routes proposed to be closed to motorized access for dispersed camping along are included in **Appendix B-10 – Routes Proposed Closed to Motorized Access for Dispersed Camping**.

Special Provision Areas for Motorized Access for Dispersed Camping

Many areas on the two Forests were also identified as "**Special** Provision" areas, where motorized access for dispersed camping would only be allowed to *designated, defined*, or *existing* sites; and no closer than 30 feet to a stream, water body or wetland for existing sites. These areas were further classified as "**Special** Provision Areas – Riparian," for those areas with water considerations, and "**Special** Provision Areas – Non-Riparian," for those areas with sensitive resources other than water.

Special Provision Areas – Riparian

All open designated routes within 300 feet of a stream, wetland, or water body that did not otherwise prohibit motorized access for dispersed camping were identified as "Special Provision – Riparian Areas." These designations are common between Alternatives 2 and 3, and include approximately 19,798 acres on the Deschutes National Forest, and approximately 39,269 acres on the Ochoco National Forest that would be subject to the special provisions associated with streams, wetlands, or water bodies. These include areas that would be open to motorized access for dispersed camping both year-round and seasonally. (See Table 4 – Acres of Motorized access for dispersed camping)

Special Provision Areas – Non-Riparian

Areas proposed for "Special Provision – Non-Riparian," were based on the "Criteria for Identifying Special Provision or Areas Closed to Motorized Access for Dispersed Camping Within 300 Feet of Open Designated Routes". All of the "Special Provision – Non Riparian" areas identified in Alternative 2 are also included in Alternative 3.

There are approximately 31,246 acres are proposed on the Deschutes National Forest and approximately 15,325 acres proposed on the Ochoco as, "Open to Motorized Access for Dispersed Camping with Special Provisions – Non-Riparian." These areas would have the same designation in both Alternatives 2 and 3. These include areas that would be open to motorized access for dispersed camping both year-round and seasonally. (See Table 4 – Acres of Motorized access for dispersed camping) These areas are displayed on the Alternative 2- Motorized access for dispersed camping maps.

Areas Proposed to be Opened to Motorized Access for Dispersed Camping

Both action alternatives would propose to open some areas to motorized access for dispersed camping currently closed to motorized access under existing Forest Order or Forest Plan direction. These areas were temporarily closed to motorized access for dispersed camping primarily with the intent to close the area to motorized access off designated routes by non-highway-legal vehicles. These areas would be proposed as "open" to motorized access for dispersed camping under the **general** provisions of the Travel Management Rule, or "open with **special** provisions", depending upon the Alternative. Approximately 45,266 acres on the Deschutes National Forest, and approximately 24,400 acres on the Ochoco National Forest (all on the Crooked River National Grassland) are currently closed to motorized access for dispersed camping that would be proposed to be open to motorized access for dispersed camping subject to the **general** conditions. (See Table 4 – Acres of Motorized access for dispersed camping) These areas are displayed on the Alternative 2 – Motorized access for dispersed camping maps.

Roads Proposed for Highway-legal Vehicles Only

No system roads currently open to public use that do not have an existing decision to close them, would be closed as a result of this decision. However, as part of the 2005 Travel Management Rule, the Regional Forester in the Pacific Northwest Region issued a letter requiring an Engineering Analysis be performed on roads that will be shown on the Motor Vehicle Use Map as designated open to motorized "mixed" use. As a consequence of this requirement, some roads that currently allow motorized "mixed" use would be changed to allow highway-legal vehicles only. These roads are displayed in **Appendix A-2– Roads Proposed to Change to Highway-legal Vehicles Only.**

The Engineering Analyses are partially complete at this time and will be finalized prior to the release of the Travel Management Final Environmental Impact Statement. Table 5- Expected Change in Roads Open to Highway-legal Vehicles, shows the mileage differences between the current highway-legal system and the expected highway-legal system under the action alternatives based on the preliminary engineering analyses.

Based on the preliminary Engineering Analyses, approximately 181 miles of NFS roads on the Deschutes and 125 miles on the Ochoco National Forest are proposed to be changed from highway-legal and non-highway-legal vehicles (motorized "mixed" use) to highway-legal only vehicles where that use is currently allowed under Oregon State Law. This would be a change from what the State of Oregon allows under current State regulation (Description of Oregon State Law related to OHV use is found in ORS 821-Off-Road Vehicles; Snowmobiles; All-Terrain Vehicles (Oregon Vehicle Code, ORS Title 59, Chapter 821)).

Connected Actions Common to Alternatives 2 and 3

Forest Plan Amendments

The Deschutes and Ochoco National Forests each have independent Land and Resource Management Plans (Forest Plan) that were prepared as required by the National Forest Management Act in the late 1980s and early 1990s. These plans differ in their landscapes, communities, and management direction. As described earlier, these plans have different levels of specificity about motorized access. For instance, both the Deschutes and Ochoco plans have similar management direction for motorized seasonal use periods and disturbance buffers in Bald Eagle Management Areas. However, on the Ochoco National Forest, some Management Area Standards and Guidelines "encourage" motorized use on designated routes, but do not specifically prohibit motorized access off designated routes or outside of designated areas as does the Travel Management Rule. The Deschutes National Forest Plan does not specifically designate any areas as "open" to motorized use off designated routes or outside of designated areas, but has generally allowed that use where it was not specifically prohibited by Standards and Guidelines.

Both action alternatives would include non-significant amendments to the Ochoco Forest Plan. The amendments would eliminate those Forest Plan Standards and Guidelines that are redundant, or are in conflict with the regulations established by the Travel Management Rule and allow for conditional motorized access for dispersed camping consistent with the selected alternative. The Deschutes National Forest Plan does not include any specific Standards and Guidelines related to motorized access that would be amended to implement the proposed actions.

The Ochoco Forest Plan would also be amended to adjust some time periods for motorized seasons of use. Under the new provisions of the Travel Management Rule, all seasons of use on designated routes are described according to the time period they are open, rather than the period during which they are closed to public use. In order to match these dates up across the two forests, some minor changes would be proposed and are shown in Table 2-2.

The Motor Vehicle Use Map published after the release of the final decision will function as the new Travel Map for the Deschutes and Ochoco National Forests and Crooked River National Grassland. Appendix C-11 includes a table of the specific changes to the Ochoco National Forest Standards and Guidelines.

Table2- 2 - Proposed Forest Plan Amendments for Season of Use

Open Season of Use	Closure Period	Reason for Closure	Proposed Change to Open Season of Use	Forest
4/1 – 9/27	9/28 – 3/31	Winter Range/Soils	4/1 – 9/30 Open 3 days longer in Sept	Ochoco - Crooked River National Grassland
5/2 – 11/30	12/1 – 5/1	Winter Range	5/1 – 11/30 Open 1 day earlier in May	Ochoco
5/2 – 9/27	9/28 – 5/1	Winter Range	5/1 – 9/30	Ochoco (Pau)
5/2 – 9/27	9/28 – 5/1	Winter Range	5/1 – 9/30	Ochoco

These actions, common to both Alternatives 2 and 3, to eliminate redundant Forest Plan guidance would have no substantive effect on the Forest Plan projected goals and objectives or standards and guidelines. There would be approximately 3 days that motorized access may be affected by the changes in use dates on open roads.

Forest Orders – Public Motorized Use Restrictions

Permanent Closures

Many Forest Orders that establish public motorized use restrictions are currently in place and would become redundant after the implementation of the Travel Management Rule. All of these orders prohibit motorized access off designated routes in some specific area. Those Forest Orders that are redundant to the Rule and establish overlapping motorized access closures off of designated routes, or that established closures that inadvertently closed motorized access for dispersed camping would be rescinded or modified to eliminate redundant regulation in concert with this decision.

Temporary Closures

Some Forest Orders establish temporary public motorized use restrictions[26] because of specific resource conditions or concerns. Areas with temporary resource-based public motorized use restrictions would be currently open to motorized access for dispersed camping except for these site-specific conditions that have established the need for the public use restriction. Wildfire areas are the most common, but not the only example of where these temporary public use restrictions are in place. In these areas, motorized access for dispersed camping would be allowed under the conditions described in Alternatives 2 or 3 and displayed on the Alternative maps after local review has determined site conditions to be suitable to resume such use.

Alternative 2

Motorized access for dispersed camping

Alternative 2 would include all the actions identified as common to Alternatives 2 and 3. The primary difference between Alternatives 2 and 3 is where motorized access for dispersed camping would be subject to **special** provisions rather than subject to only the **general** provisions.

Alternatives 2 and 3 would both allow for motorized access for dispersed camping in riparian areas only under the **special** provision conditions. However, Alternative 2 would designate some areas as open to

[26] These areas are not displayed separately from permanent closures on the Alternative maps. Not all current temporary public use restrictions are shown on the Alternative maps.

motorized access for dispersed camping subject to **general** provisions only (shown as "continued existing open" or "proposed open" on the Alternative 2 map), in the non-riparian (upland) areas. Alternative 2 would also allow motorized access for dispersed camping within Inventoried Roadless Areas under **special** provision conditions only. Alternative 2 – Motorized access for dispersed camping maps, shows those routes and areas that would be open to motorized access for dispersed camping under either **general** or **specia**l provisions.

Alternative 2 would designate approximately 353,686 acres on the Deschutes National Forest and 69,733 acres on the Ochoco as "open to motorized access for dispersed camping[27]" either year-round or seasonally within 300' of a designated route under the **general** provisions, and approximately 62,894 acres on the Deschutes National Forest and 54,594 acres on the Ochoco National Forest would be "open to motorized access for dispersed camping with **special** provisions," either year-round or seasonally. This would include approximately 247 acres of Inventoried Roadless Areas on the Deschutes National Forest and approximately 1,853 acres on the Ochoco National Forest, primarily in the Deschutes – Steelhead (1,296 acres) on the Crooked River National Grassland.

Alternative 3

Motorized access for dispersed camping

Alternative 3 would include all of the actions common to Alternatives 2 and 3. Alternative 3 would only allow motorized access for dispersed camping to *designated*, *defined* or *existing* sites along all open designated routes (**special** provision conditions would apply to all motorized access for dispersed camping adjacent to designated open roads). Alternative 3 would also prohibit any motorized access for dispersed camping in Inventoried Roadless Areas. Those routes and areas that would be designated as "**special** provision areas" are shown on the Alternative 3 – Motorized access for dispersed camping maps.

Alternative 3 would designate approximately 416,580 acres on the Deschutes and approximately 124,327 acres on the Ochoco National Forest as open to motorized access for dispersed camping with **special** provisions.

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of the proposed action and alternatives, 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.

- Several commentors suggested that we consider an alternative that would modify motorized access for dispersed camping buffer for setback to streams, wetlands, and water bodies from 30 feet to 50 – 100 feet.

Response (part 1): A number of studies on logging disturbance, which generally has a much higher sediment delivery potential to streams than dispersed camping, found that buffers ranging from 30 to 7 meters (98 to 23 feet) were sufficient to remove sediment (Moring (1982), Erman (1977), Clinic (1985), Reshen et al. (2006), Haupt and Kidd (1965), and Heade (1990)). Ground based logging equipment normally operates on slopes up to 35% with cable systems used above this, whereas access to dispersed campsites tends to be at or below 10% with the campsites at less than 5%. Since slope is a major factor in

[27] Subject to the "**General** Provisions" identified earlier in this chapter.

sediment delivery and potential sediment delivery increases at a faster rate on steeper slopes, the studies found that 10 to 7 meter (32 to 23 feet) buffers would be more representative. A 30 foot stream setback showed no sediment delivery to the stream when the FS WEPP model was run against a 10% rutted access road on silty loam, loam, and sandy loam soils accessing a simulated dispersed camp site.

Response (part 2): At the heart of issue is whether the campsite is a problem, and that is best evaluated on a site-by-site case rather than by establishing a general "buffer" rule. For example, dispersed camping along the banks of the Upper Deschutes River below Wickiup Dam is limited to designated sites only. These sites were designated after examining the site conditions and determining what existing sites would be suitable to maintain considering a variety of resource and social values. Site conditions play a big role in determining suitable setbacks, with some designated sites established within 150 feet and others as close as 20 feet. If a 100 foot standard "buffer" were employed, many sites that may be suitable would potentially be eliminated. Forest-wide, dispersed camping is evaluated and managed on a site-by-site basis through the recreation program and will continue to be addressed more specifically through this program.

- Several commentors identified, for various reasons, a desire to not have the Forests prohibit motorized access off designated routes in areas that do not currently prohibit such travel; or to designate areas as "open to motorized travel off of designated routes," that were proposed to be closed to motorized travel off designated routes. Commentors clearly had an interest in seeing no change to the existing condition related to motorized access off designated routes, and some also indicated interest in having large,undefined, areas that would be open to motorized access off designated routes.

Response: Alternative 1: the "No Action/No Change" alternative is considered in this DEIS and would not prohibit motorized access off designated routes where it is not currently prohibited. Alternatives 2 and 3 includes designating several currently developed rock/cinder pits as open to motorized travel off of designated routes if they are in areas that have not been prohibited to motorized use through past decisions, and are considered suitable for continuing that use according to the criteria identified by the Forest. The question of whether to consider designating large geographic areas as "open off of designated routes" was considered by the PAC Travel Management Subcommittee and Working Group during their work on their recommendation on how to implement the Travel Management Rule. They did not support designating large scale new "open" areas at that preliminary stage because of the potential for resource damage, and the concern about the ability of the agency to adequately monitor an area to ensure resource damage was not occurring as a result of that designation. There was a general recognition and acceptance of those existing staging areas or play areas associated with designated motorized trail systems. Pacific Northwest Regional Guidelines retained the authority to designate motorized access for big game retrieval with the Regional Forester[28]. This determination was supported by other federal and state agencies, such as Oregon Department of Fish and Wildlife. In their comments on the proposed action, also discouraged any consideration of allowing motorized access off of designated routes specifically for the purposes of hunting or game retrieval. Their comment letter also highlighted their interest in continuing existing agreements on seasonal or year-round road closures as well as highlighting their continued interest in seeing the overall road density reduced across both Forests. As noted in the section on related projects, there are currently several motorized trail projects proposed that would provide additional "backcountry" motorized trail access off of designated road systems, and would include staging and play areas for specialized motorized recreational vehicles. Implementing the proposed action without including large geographic areas where motorized access is allowed off of designated routes at this time does not preclude the option of considering specific areas

[28] The authority to designate motorized access for big game retrieval within 300' of a designated route is retained with the Regional Forester. Regional guidance states, "*Big Game Retrieval: No off-road motor vehicle travel to retrieve big game will be authorized, except by the Regional Forester. Discussions with adjacent regions and State Fish & Wildlife Department indicate support for not designating use of motor vehicles off designated routes for the purpose of big game retrieval." (*Region 6 Guidelines: Implementation of the Travel Management Rule**" (**September 6, 2006 – Revised April 20, 2009)).

for that type of access in the future. Based on these considerations, designating large geographic areas as "open to motorized access off designated routes was not an alternative considered in detail at this time.

- Commentors concerned about motorized access for game retrieval sometimes expressed concerns without specifics related to whether the Rule would allow for the agency to address that concern. One provision the Travel Management Rule does allow is for motorized access for game retrieval within the same 300 foot area adjacent to open designated routes, and under the same vehicle class conditions, as that provided for motorized access for dispersed camping.[29]

Response: Current Forest Service policy is to discourage motorized access within 300 feet of an open road for game retrieval and only allow motorized access for this reason with Regional approval.[30] As stated before, the policy is supported and promoted by other federal and state agencies such as Oregon Department of Fish and Wildlife. The policy also helps to maintain a regionally consistent approach to to motorized access for big game retrieval on National Forest lands. Although the comments we received on this topic were seldom focused on that 300 foot strip, whether to allow that access was considered because it is within the scope of the rule, and because it could potentially, in some way address concerns of the public regarding this topic. However, it was not considered in detail because it would not very effectively address the bulk of the concerns raised about motorized access for game retrieval. Game taken within 300 feet of a road does not usually present an unreasonable burden to the hunter to bring to an open road. Under the conditions of the proposed action, that distance would be lessened if the game was taken in close proximity to a dispersed camp within 300 feet of an open road. This alternative was not considered at this time, because providing motorized access within 300' of an open designated route for the purpose of game retrieval was unlikely to be an effective means of addressing concerns related to motorized access for game retrieval.

- Some commentors felt that we should provide motorized access for dispersed camping only with designated routes. These comments indicated that they did not feel the combination of "**General**" and "**Special**" Provisions, including the areas that would be closed to motorized access for dispersed camping, in the proposed action were sufficient to protect sensitive resources. These comments also indicated the 300' area would not necessarily provide them with access to the sites they most desired.

Response: Providing motorized access for dispersed camping with only designated routes has a number of concerns that could not be addressed in the time frame established for completing this DEIS and publishing the Motor Vehicle Use Map. Designating routes to all existing dispersed sites would require an extensive inventory and evaluation of all of the existing sites to determine the feasibility of providing a designated access, and would require additional engineering studies to be able to establish a route that could be included as part of a NFS road. There are also concerns about whether or not a designated route that would lead to one or more indefinable "end points" would be a suitable addition to the national forest system of roads and trails. Therefore, an alternative that would consider this method of providing motorized access for dispersed camping was not considered at this time. Opportunities for future

[29] 36 CFR 212.51(b) states: "The responsible official may include in the designation the limited use of motor vehicles within a specified distance of certain designated routes, and/or specified time periods, solely for the purposes of dispersed camping or big game retrieval."

[30] The authority to designate motorized access for big game retrieval within 300' of a designated route is retained with the Regional Forester. Regional guidance states, "*Big Game Retrieval: No off-road motor vehicle travel to retrieve big game will be authorized, except by the Regional Forester. Discussions with adjacent regions and State Fish & Wildlife Department indicate support for not designating use of motor vehicles off designated routes for the purpose of big game retrieval." (*Region 6 Guidelines: Implementation of the Travel Management Rule**" (**September 6, 2006 – Revised April 20, 2009)).

designations of routes to sites could be addressed at the Ranger District as a result of public comments and concerns.

Comparison of Alternatives

This section provides a summary of the key effects of each alternative. Information is provided in two ways. The first set of tables (Tables 2-3 – 2-5), display a numeric comparison between the alternatives of the amount of acres and miles of roads that are available for motorized access under various the various conditions that were described earlier in this Chapter. These numbers are not intended to represent exact acreages for each category of motorized access, but are rather intended to provide a basis for relative comparison between the alternatives. For the purposes of this analysis, the total acreage affected on the Deschutes National Forest was calculated to be about 1,612,937 acres, and about 723,855[31] for the Ochoco National Forest, including 110,031 acres for the Crooked River National Grassland. Table 2-6, the Issue Comparison Summary provides a more narrative description of the potential effects of the relative changes in motorized access. The narrative summary in Table 2-6 focuses on how the alternatives meet the purpose and need and responds to the issues described in Chapter 1.

Table 2-3- Acres of Motorized Access Off Designated Routes (% of Total Forest Acres)

	Alternative 1		**Alternative 2**		**Alternative 3**	
	Deschutes	**Ochoco**	**Deschutes**	**Ochoco**	**Deschutes**	**Ochoco**
Open year-round	543,136 (34%)	189,369 (26%)	1,075 (<1%)	191 (1%)	Same as Alternative 2	
Open Seasonally	82,294 (5%)	242,415 (33%)	0	20 (1%)	Same as Alternative 2	
Closed[32]	987,507 (61%)	292,071 (41%)	1,611,862 (~99%)	723,644 (~99%)	Same as Alternative 2	
Total	1, 612,937	723,855	1,612,937	723,855	Same as Alternative 2	

Table 2-4- Acres of Motorized Access for Dispersed Camping[33] (% of Total Forest Acres)

	Alternative 1		**Alternative 2**		**Alternative 3**	
	Deschutes	**Ochoco**	**Deschutes**	**Ochoco**	**Deschutes**	**Ochoco**
Year-round						
Open	962,717 (60%)	246,712 (34%)	306,875 (19%)	53,056 (7%)	0	0
Open to Designated Sites Only	11, 850 (<1%)	0	Same as Alternative 1			
Open with Special Provisions-Riparian	0	0	18,435 (1%)	29,083 (4%)	Same as Alternative 2	
Open with Special Provisions	0	0	22,304	8,899	329,179	61,955

[31] Based on acreage computed from the Deschutes and Ochoco National Forest geospatial data base maps prepared for the Travel Management EIS. Total acreages may vary slightly due to differences between individual sources and/or databases used to calculate or obtain the acres (ie, differences in Forest Service databases such as GIS, INFRA and FACTS)

[32] Includes areas currently closed to motorized access off designated routes and areas closed to off-highway vehicles off designated routes.

[33] Acreages are coincident with those acres shown in Table 3 – Motorized Access Off Designated Routes, but relate more specifically to where motorized access for dispersed camping is now and would be proposed to be allowed in Alternatives 2 and 3.

	Alternative 1		Alternative 2		Alternative 3	
	Deschutes	**Ochoco**	**Deschutes**	**Ochoco**	**Deschutes**	**Ochoco**
Non-Riparian			(1%)	(1%)	(20%)	(9%)
Closed	446,902 (28%)	221,619 (31%)	1,196,357[34] (74%)	599,528[35] (83%)	Same as Alternative 2	
Seasonally						
Open	191,468 (12%)	255,524 (35%)	46,811 (3%)	16,677 (2%)	0	0
Open with Special Provisions-Riparian	0	0	1,363 (<1%)	10,186 (1%)	Same as Alternative 2	
Open with Special Provisions Non-Riparian	0	0	8,942 (<1%)	6,426 (~1%)	55,753 (3%)	23,103 (3%)
Total	1,612,937	723,855	1,612,937	723,855	1,612,937	723,855

Table 2-5- Expected Change in Roads Open to Highway-legal Vehicles

FOREST	**Open to HWY Legal Only**			**Open to Motorized Mixed Use**			OPEN Miles
	Existing	**Alt 2,3**	**Change**	**Existing**	**Alt 2,3**	**Change**	
Deschutes NF	770	951	181	5,362	5,181	-181	6,132
Ochoco NF	242	367	125	1,388	1,262	-125	1,630
Crooked River NG	2	2	0	260	260	0	262
Totals:	1014	1,320	306	7,010	6,703	-306	8,024

[34] Includes approximately 401,635 acres that would remain unchanged as closed to motorized access for dispersed camping, this includes 198,908 acres closed to all motorized access and 202,727 acres currently closed to motorized access for dispersed camping

[35] Includes approximately 183,694 acres that would remain unchanged as closed to motorized access for dispersed camping, this includes 74,465 acres closed to all motorized access and 109,229 acres currently closed to motorized access for dispersed camping

Table 2-6. Travel Management Issue Comparison Summary

Issue and Indicator	Alternative 1	Alternative 2	Alternative 3
Purpose and Need			
Motorized access off of designated routes			
Motorized Access available off designated routes (MAODR) (ie. cross-country travel)	Motorized access off designated routes would not be prohibited with this decision on about 39% of the Deschutes National Forest and about 41% of the Ochoco National Forest.	Motorized access off designated routes would be prohibited within the approximately 39% of the acres on the Deschutes and the 41% of the acres on the Ochoco where not currently prohibited or limited to designated routes. Motorized access off designated routes would continue to be allowed within existing designated ohv areas.	
Public Safety			
Conditions of motorized mixed use access on roads where necessary to allow for suitable access.	Motorized mixed use under Oregon State Law is currently allowed on 5,181 miles of the Deschutes and 1,522 miles on the Ochoco	Approximately 3% of total roads currently open to motorized mixed use on the Deschutes and 8% on the Ochoco of total road miles would be changed to only allow highway-legal vehicles.	
Issues used to Modify the Proposed Action or Develop Alternatives			
Motorized Access Off Designated Routes			
Existing cinder and rock mineral sources (rock/cinder pits) open to motorized access.	Approximately 200 rock/cinder pits are open to motorized access unless physically barriered.	30 rock/cinder pits (approximately 160 acres) on the Deschutes and 22 rock/cinder pits (approximately 191 acres) on the Ochoco would be designated as open to motorized access off designated routes.	
Motorized Access for Dispersed Camping			
Amount of area and conditions under which motorized access for dispersed camping is	MADC would continue to be allowed as provided by current direction. Available on about 72% of the total acres of the	Motorized access for dispersed camping would be allowed under general and special provisions on about 26% of the Deschutes and about 17% of the Ochoco National Forests. Some areas currently closed would be opened to motorized access for dispersed camping under general and special provisions.	

Issue and Indicator	Alternative 1	Alternative 2	Alternative 3
allowed	Deschutes and 69% of the Ochoco[36].		
Riparian areas	About 1% of the total forest acres on the Deschutes limit motorized access to designated sites. Sites are regularly being defined with barriers to establish setbacks in problem areas, but no specific motorized setbacks in most riparian areas.	Motorized access for dispersed camping is allowed only under **general** *and* **special provisions** when an open designated route is within 300 feet of a stream, wetland or waterbody. About 2% of total forest acres on the Deschutes and about 4% on the Ochoco would be open to motorized access for dispersed camping under these conditions.	
Non-riparian (upland) areas	Motorized access for dispersed camping would continue under current conditions. Some upland areas on the Deschutes and Ochoco (Grassland) prohibit motorized access for dispersed camping	Motorized access for dispersed camping is allowed under **general** provisions along most open designated roads. Motorized access for dispersed camping allowed under **special provisions** when an open designated route in an upland areas meets special designation criteria for sensitive non-riparian resources.	All motorized access for dispersed camping adjacent to open upland routes would allow motorized access for dispersed camping only under general *and* special provisions
Inventoried Roadless Areas	About 75% of inventoried roadless areas on the Deschutes, 31% on thee Ochoco currently do not prohibit motorized access for dispersed camping	Motorized access for dispersed camping in IRAs would be allowed on less than 1% off the Deschutes and less than 4% of the Ochoco adjacent to open designated routes under general *and* special provisions. Approximately 8% of the IRA on the Grassland that is currently closed to motorized access for dispersed camping along existing designated open roads would be open under general *and* special provisions.	Motorized access for dispersed camping would be prohibited in all IRAs.

[36] not all of this acreage is accessible to motor vehicles

Issue and Indicator	Alternative 1	Alternative 2	Alternative 3
Other Issues			
Motorized Recreation			
Amount of and uses of existing designated motorized trails	Over 300 miles of existing designated motorized trails for a variety of OHVs, including rock pits and staging areas open to motorized access off of designated routes.		
Percent of the forest accessable by roads	Approximately 88% of the Deschutes and 83% of the Ochoco total acres outside of Wilderness areas are within one-half mile of an open designated road.		
Motorized recreation use of designated roads	Approximately 8000 miles of roads are available for motorized recreation and access for highway legal vehicles		
	Just over 7,000 miles of road available for highway legal and non-highway legal (motorized mixed use) recreation and access	Motorized mixed use recreation and access opportunities on designated roads would be reduced by about 181 miles on Deschutes and 125 miles on Ochoco of total miles Motorized recreation on available roads could increase, but less desirable recreation experience for some than designated or undesignated trails; some reduced connectivity between road systems available to non-highway legal vehicles	
Amount of area available to motorized access off of designated routes	Approximately 39% of the Deschutes and 41% on the Ochoco are currently available for motorized access off of designated routes.	All motorized access would be limited to existing designated roads and trails. About 300 acres (52 rock pits) across the two forests would be designated for motorized access off of designated routes (cross-country travel).	
Amount of area available to motorized access for dispersed camping & conditions for use	Motorized access for dispersed camping would remain under current regulation	Recreational opportuntieis for motorized access for dispersed camping would be about the same as current uses in riparian areas and upland areas, including IRAs	Recreational opportunities for motorized access for dispersed camping would be about the same in riparian areas and more limited in upland areas. There would be no opportunities for motorized access for dispersed camping in IRAs
Non-motorized Recreation			
Acres proposed closed to MAODR & MADC	Approximately 987,507 acres on the Deschutes National Forest and 292,071 acres on the Ochoco National Forest are	An additional 624,355 acres would closed to motorized access off designated routes on the Deschutes and 431,575 on the Ochoco. This would not directly change any non-motorized opportunities, but may make some areas more desirable to non-motorized users by reducing the evidence of motorized use in	

Issue and Indicator	Alternative 1	Alternative 2	Alternative 3
	currently closed to motorized access off designated routes	the area.	
Motorized access on non-motorized trails	194 miles of non-motorized trails within areas that do not prohibit motorized access that may have motorized use on or near the trails	There would be an increase in the areas where non-motorized recreation users would expect to not encounter motorized vehicle users. There would be fewer potential encounters with motorized vehicles adjacent or on to non-motorized trails.	
Congressionally Designated Areas (CDA)			
Area available to motorized access off designated routes	Less than 1% of the areas are available to motorized access off designated routes This would reduced the potential for motorized use to affect the outstanding remarkable values of our CDAs, and would help to protect and enhance the values		
Areas available to motorized access for dispersed camping	Motorized access for dispersed camping would remain under current regulation	Recreational opportuntieis for motorized access for dispersed camping would be about the same as current uses in riparian areas and upland areas	Recreational opportunities for motorized access for dispersed camping would be about the same in riparian areas and more limited in upland areas.
Social Factors			
Amount and conditions for motorized access on designated roads and trails across the forests and within the Wildland-Urban Interface	Continued motorized access under current conditions on existing designated roads and trail**s** allow motorized access within ½ mile of more than 80% of the two forests Equal amount of motorized access opportunities in all alternatives for primitive motorized exploration on roads and trails and motorized access to the road and trail system for access between neighborhoods		
Opportunities and conditions for motorized access off designated roads and trails across the forests that reflect a sample of social attitudes,	39% of Deschutes and 60% of Ochoco provide the most motorized access off designated for primitive motorized exploration; solitude of the	About 1% of two national forests open to motorized access off designated routes would reduce opportunities for people that value undesignated motorized off-road or trail access for primitive exploration or solitude.	

Issue and Indicator	Alternative 1	Alternative 2	Alternative 3
beliefs or values such as primitive exploration, solitude	three alternatives.		
Opportunities and conditions for non-motorized uses across the forests reflect a sample of social attitudes, beliefs or values, such as peace and quiet away from the evidence of motorized uses	61% of the Deschutes and 40% of the Ochoco NF would continue to offer primary or exclusive **non-motorized uses**. Alternative 1 would provide the least amount of area closed to motorized access off designated routes of the three alternatives for people who value peace and quiet away from the sights and sounds of motorized uses.	About 1% of two national forests open to motorized access off designated routes would increase opportunities for people that value peace and quiet away from the evidence of motorized uses.	
Economic Factors			
Recreation use trends and economic contributions	Overall contributions and trends to the local or regional economy from either motorized or non-motorized uses are unlikely to change in any Alternative. Data indicates non-motorized uses and contributions to the economy are currently and anticipated to continue to dominate compared to motorized uses.		
Transportation			
Effects on existing transportation system from changes in use on and off designated roads	Approximately 8000 miles of roads are currently open for public use across the Ochoco and Deschutes National Forests and Crooked River National Grassland. These roads would continue to be used as they are presently, and public use would remain as it is today.	An increase in overall road use would be expected in areas where there is currently a high level of off-road OHV use nearby. The effect of this increased use would be an increase in surface wear on some roads which may result in a need for additional maintenance work. Reduction in the mileage of roads available for motorized “mixed” use may reduce surface wear fom ohvs on some roads.	
Fisheries/Hydrology			
Acres open to motorized access off designated routes	Approximately 55,850 acres where motorized access off	Motorized access off designated routes would be eliminated within 100’ of water bodies, thus eliminating the potential for effects to fisheries and water quality	

Issue and Indicator	Alternative 1	Alternative 2	Alternative 3
and motorized access for dispersed camping within 100' of a stream	designated routes or motorized access for dispersed camping is not prohibited within 100' of water bodies on both forests would continue to potentially affect sediment, turbidity and shade to streams	from motorized access. Motorized access for dispersed camping would be reduced to approximately 20,000 acres within 100' of streams, wetlands, and water bodies as a result of establishing special provisions. Increased infiltration from vegetative recovery from limiting motorized access for dispersed camping to exsiting, designated, or defined sites no closer than 30' to streams, wetlands and waterbodies would reduce potential sediment and turbidity effects on fisheries and water quality.	
Geology and Minerals			
Acres available to and conditions for motorized access within dormant/active landslide areas	Landslide terrain acres would continue to be susceptible to new disturbance from motorized access off designated routes and motorized access for dispersed camping on about 3 active acres and 214 dormant the Deschutes and 46 active acres and 64,398 dormant acres on the Ochoco	Landslide terrain acres susceptibility to new disturbance from motorized access off designated routes would be eliminated across both forests. Susceptibility to new disturbance from motorized access for dispersed camping would be reduced by limiting motorized access for dispersed camping to general and special provisions, especially within riparian areas. On the Deschutes susceptibility on dormant acres would be reduced from 214 to 88; on the Ochoco from about 64,000 to 12,000. Susceptability to new disturbance on active landslide terrain would not be changed on the Deschutes, but would be reduced on the Ochoco from 46 acres to about 12. On the Grassland, approximately 255 acres of dormant landslide terrain acres would be potentially available for motorized access for dispersed camping within 300' of existing open designated roads under general or special provisions. This is not within an area that would be of concern because it is not adjacent to a water quality limited stream.	
Acres of Highly Permeable Rock susceptible to disturbance from motorized access	Susceptablity within riparian and upland areas would continue over about 492,331 acres across both forests.	Susceptibility to new disturbance from motorized access off designated routes would be reduced across both forests. Susceptibility to new disturbance from motorized access for dispersed camping would be reduced by approximately 167,638 because of special provisions in riparian areas.	
Soils			
Acres open to Motorized access off designated routes and motorized access for	Soils within riparian and non-riparian (upland) areas would continue to be susceptible to	Susceptibility to new soil disturbance from motorized access off designated routes would be eliminated across both forests.	

Issue and Indicator	Alternative 1	Alternative 2	Alternative 3
dispersed camping	new disturbance from motorized access off designated routes and motorized access for dispersed camping on about 1,057,214 acres across both forests.	Susceptibility to new soil disturbance from motorized access for dispersed camping would be reduced by approximately 105,638 acres primarily from special provisions for motorized access for dispersed camping .	Susceptability to new soil disturbance from motorized access for dispersed camping would be reduced by approximately 529,057 compared to Alternative 1 due to special provisions for motorized access for dispersed camping
Susceptability of salable minerals within developed sources to invasive species from areas open to motorized access	Susceptability would continue from motorized access on about 1,406 acres open to motorized access off designated routes in 200 rock/cinder pits across both forests.	Susceptibility of developed mineral sources to new invasive species infestations from reduced across both from by approximately 1,054 acres 1 due primarily to closure of rock/cinder pits to motorized access.	
Native Vegetation			
Acres open/closed to MAODR and MADC for: Native plants and their habitats identified by the Forest Plant Association Groups (PAGs) Special or unique vegetation habitat types Other rare or uncommon plant populations	Provides the least protection to native plants and their habitats, including special habitats and sensitive and other rare or uncommon plants, because more (often the majority) acres are open to MAODR and MADC with no special provisions.	Increases the protection for native plant habitats over Alternative 1, including special habitats and sensitive and other rare or uncommon plants, because 100% of acres are closed to MAODR. Special habitats and sensitive plants and areas are protected from MADC by **special** provisions, (16%) of upland habitats remain to MADC without **special** provisions	Same as Alternative 2 in relationship to MAODR Highest level of protection for native plant habitats, including special habitats and sensitive and other rare or uncommon plants, because all MADC is limited to **special** provisions (*designated, defined* or *existing* sites)
Threatened and Endangered Plant Species			
Threatened and Endangered Plant Populations and Habitats	There are no federally listed Threatened or Endangered plant species or habitats documented or suspected to occur in the Planning Area. Therefore, activities proposed in the alternatives would have no effect on federally listed plant species.		
Invasive Plants			
Acres of known invasive plant populations in areas open/closed to motorized	Highest risk that invasive plants would spread and establish, because more sites and acres are	Reduces impacts from invasive plants, because most known invasive plant sites are closed to motorized access off designated routes and motorized access for dispersed camping. 52 of 531 existing rock pits would be designated open to	

Issue and Indicator	Alternative 1	Alternative 2	Alternative 3
access off designated routes	located within areas open to motorized access off designated routes and motorized access for dispersed camping	motorized access off designated routes, with potential for spread if invasive populations are present	
Acres of known invasive plant populations in areas open/closed to motorized access for dispersed camping		16% of acres occupied by invasive plants occur in non-riparian (upland) with motorized access for dispersed camping under general provisions only	Provides most protection against establishment, spread, and expansion of invasive plant populations because motorized access for dispersed camping would be allowed only under general and special provisions
Vegetation Mangement Activities and Wildfires			
Acres open/closed to motorized access off designated routes which may contain forest conditions more conducive to motorized access	Continued unauthorized route creation, vegetation damage, and possibly impeded vegetation response caused by motorized access in vegetation treatment areas and areas burned by large wildfires on about 65,780 on the Deschutes and 45,418 acres on the Ochoco	Acreage available for disturbance from motorized access off designated routes in vegetation treatment areas and areas burned by large wildfires would be eliminated.	
Acres open/closed to motorized access for dispersed camping which may contain forest conditions more conducive to motorized access than many untreated areas	About 93,830 acres on the Deschutes and 55,515 acres on the Ochoco open to motorized access for dispersed camping on could have similar responses to motorized access off designated routes	Acreage available for disturbance from motorized access for dispersed camping would be reduced in vegetation treatment areas and areas burned by large wildfires on about 38,573 on the Deschutes and 12,199 acres on the Ochoco Areas open to motorized access for dispersed camping under general provisions only could lead to additional concentration of uses and creation of new disturbance from motorized vehicles in areas where vegetation treatment areas	Acreage available for new disturbance from motorized access for dispersed camping in vegetation treatment areas and areas burned by large wildfires would be eliminated because all areas open to motorized access for dispersed camping would be subject to special provisions for motorized access for dispersed camping

Issue and Indicator	Alternative 1	Alternative 2	Alternative 3
		or burned areas overlap	
Wildlife			
Wildlife species disturbed by motorized access (within 200m of open designated roads)	Disturbance to wildlife species on the Deschutes and Ochoco would continue across both forests and would be susceptible to new disturbance from motorized access	Disturbance from MAODR and MADC would decrease for 61 wildlife species and 31 wildlife species on the Deschutes and Ochoco, respectively. Disturbance would remain unchanged for 16 wildlife species and 41 wildlife species on the Deschutes and Ochoco respectively Susceptibility to new disturbance would be eliminated due to no elimination of motorized access off designated routes and special and general provisions for motorized access for dispersed camping	
Range Management & Livestock Grazing			
Potential for damange to range improvements and forage	Motorized access within grazing allotments can result in damage to range improvements and forage vegetation.	The potential for damage to range improvements would be reduced and grazing operations could be improved directly by increasing forage quantity and quality and indirectly by reducing the potential for the spread and establishment of invasive plant species by motorized access off designated routes	
Fire Risk			
Potential changes in the location of unplanned human-caused ignitions & proximity of those ignitions to suppression forces For those more than 300' off of an open designated route that are proposed closed to MADC or proposed closed to MAODR For those within 300' of an open designated route	Unplanned human-caused ignitions as a result of motorized access would likely increase with urban growth and increasing recreation uses. Unauthorized routes would continue to be created and used and thus have potential for use by suppression forces or as fire/fuel breaks, if an ignition were to occur than other alternatives	It is most likely that the total number of unplanned human-caused ignitions across would likely remain the same or increase with projected increases in Forest use, but would potentially be more concentrated in areas witnin 300' of an open designated route, which would bemore accessible to fire suppression resources. Existing unauthorized routes would likely persist for 10 years or more absent any rehabilitation efforts before they would be naturally eliminated and the potential for use by suppression forces or as fire/fuel breaks would be eliminated.	
Air Quality			
Measurable effect of changes in motorized access on air	No measurable effects		

Issue and Indicator	Alternative 1	Alternative 2	Alternative 3
quality standards			
Heritage Resources			
Acres open to motorized access	Cultural resources are fragile and non-renewable. They would continue to be vulnerable and susceptible to new disturbance from motorized access over 1,057,214 acres across both forests.	Susceptibility to new disturbance from motorized access off designated routes would be eliminated	
		Susceptability of cultural resources to new disturbances from motorized access for dispersed camping would be reduced by approximately 105,638 acres from Alternative 1 due primarily to special provisions for motorized access for dispersed camping	Susceptability of cultural resources to new disturbances from motorized access for dispersed camping would be reduced by by approximately 529,057 acres from Alternative 1 due to special provisions for motorized access for dispersed camping
Scenery			
Effects of motorized access within scenic view corridors	Foreground and middleground views have been and would continue to be altered by motorized access off designated routes such as on buttes and cinder cones, and by motorized access for dispersed camping adjacent to major scenic road corridors	Foreground and middleground views altered by unauthorized roads or trails from motorized access off designated routes would be eliminated in future and over time could revegetate	
		Benefical indirect effects where MADC is limited to *designated, defined* or *existing* campsites by reducing the visual impacts within view corridors, Special provisions for motorized access for dispersed camping would facilitate vegetation recovery, improving visuals from view corridors	

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. Following a brief summary of some of the key assumptions and data sources upon which the analysis in this Chapter is based, a description of the environmental consequences for each affected resource is presented. Each section of this Chapter will provide an executive summary of the analysis and major conclusions for that resource or environmental component and a description of the relevant affected environment and/or existing conditions that provide the basis for evaluating the environmental consequence of implementing the alternatives considered in detail. This part of the Chapter is concluded with an analysis of the cumulative effects associated with implementing Alternatives 2 or 3. The Chapter ends with a series of brief disclosures as required by federal law or Forest Service policy or regulation.

Analysis Assumptions

Several key common assumptions and data sets were used to guide and frame the analysis of environmental consequences. These are briefly described below. Additional relevant resource-specific assumptions, data, and/or methodology used for the analysis may be included or referenced under appropriate resource analyses.

The following assumptions were used by the interdisciplinary team to help guide and frame their analysis of effects where relevant:

General

The acreage open to motorized travel off designated routes and motorized access for dispersed camping was used as a relative indicator for potential impacts from forest users that could affect all natural resources and habitats.

Recreational Uses

- Overall visitation to the Forest will generally increase in the long run as the population of the Central Oregon area grows. According to the Economic Development for Central Oregon, based on population trends from 1990 – 2008, population in the tri-county area is projected to increase approximately 33% over the next decade (*Portland State University Center for Population Research; U.S. Census Bureau;estimates are for July of each year)*. Because of this, there could be:
  - more frequent use of dispersed campsites
  - potential for expansion of the dispersed campsite size
  - increased demand for OHV riding (Cordell, Betz, Green and Mou 2008; Bergerson et al 2005)
  - increased use of designated routes
  - increased presence of members of the public on any given area of ground where motorized travel is authorized

- In the short term, higher gasoline prices, negative consumer confidence, and tight credit markets will have a modest downward pressure on all Forest visitations and OHV recreation (Albright 2008). As gasoline prices rose sharply during the past two years, Forest developed campground occupancy has declined somewhat and in some cases has stayed level. Recreation in the Deschutes and Ochoco National Forests may look like an economically attractive alternative for visitors in the market zone compared to longer trips involving airline travel. Rather than abandon the sport altogether, OHV

enthusiasts are predicted to recreate closer to home. For Central Oregon residents, the Deschutes and/or Ochoco National Forest and Crooked River National Grassland are substantially closer to home than Portland, the Willamette Valley, or the coastal dunes. Less than half of OHV survey respondents in 2005 said that "lack of money" was an important reason for not participating in their motorized activities more than they do (Bergerson et al 2005). A survey done today would likely reveal a higher percentage affected by financial concerns.

Designated Routes

There are no proposals in this DEIS to designate any new roads or trails that are not currently a designated National Forest system road, trail or area. As such, it is assumed that there will be no additional adverse effects to resources (wildlife, vegetation, fisheries, soil, range, etc.) associated with roads as a result of implementation of Alternatives 2 and 3.

Motorized Access for Dispersed Camping

Summaries and reliable comprehensive inventory data about exact numbers, locations, size and condition of dispersed sites across the two forests is not currently available. Therefore, the following assumptions about the locations, size, use and recovery rates guided the analysis of effects:

- The number of dispersed sites on the Ochoco National Forest in particular have increased since the Forest Plan era 1990 inventories were collected, a trend which is supported by indirect correlations of increased recreation use associated with population growth rates of the Tri-County area (Deschutes, Crook and Jefferson counties). Data on the Deschutes National Forest is more recent and has been updated into the GIS data base, but is not comprehensive. Recreation use trends and projected population trends were combined to develop an estimate of about a 23% increase in population to help frame possible increases in motorized access for dispersed camping.
- Motorized access for dispersed camping usually occurs more frequently near local attractions, especially water sources such as rivers, lakes and meadows, or in other areas associated with specific recreational activities such as hunting or motorized or non-motorized trail access.
- Field observations by Forest Service recreation specialists have found that most people that use motorized access for dispersed camping will also use:
    - an existing dispersed site rather than create a new one if the existing site is in a desirable area and is not occupied. New sites are more likely to be created when existing sites in desirable areas are already occupied.
    - what appears to be an already existing route (even if not a signed designated route) to a dispersed site rather than create a new one; and are more likely to create new unauthorized routes only if needed to access a new site or if the existing unauthorized route is unpassable .
- Limited data on inventoried dispersed sites is available in the geospatial data bases for the two forests. The data that has been gathered and input into the system has had varying quality assurances and controls and occurred over a long span of time during which technology has changed. Therefore, all known (inventoried) dispersed sites identified in the geospatial data bases (GIS) :
    - Within 100 foot of a waterbody are assumed for analysis purposes to be immediately proximate to the edge of the water body.
        - Under current conditions (Alternative 1), motorized access for dispersed camping could also be immediately proximate to the edge of the waterbody and include unregulated crossings
        - Alternatives 2 and 3 would limit all motorized access for dispersed camping to no closer than 30 feet from edge of water bodies and would not allow for unregulated crossings
    - Are assumed, on average, to extend about 100 feet along water body bank

        - Under current conditions for motorized access for dispersed camping (Alternative 1), 50% of the site along the bank would be affected by motorized access (50 lineal feet of bank)
        - In Alternatives 2 and 3, changed conditions for motorized access for dispersed camping would reduce that amount to about 25 lineal feet of bank. This assumes that reduced vehicular impacts directly adjacent to banks will allow for some ground cover vegetation to reestablish but that access to the water body by foot traffic will continue to occur on some portion of the bank.
    - Under current conditions (Alternative 1) for motorized access for dispersed camping, are assumed to have an area of vehicular impact within a dispersed campsite area of approximately 0.17 acres (100 feet x 75 feet)[37].
    - Under changed conditions for motorized access for dispersed camping in Alternatives 2 and 3 adjacent to a waterbody, the area of vehicular impact would be expected to result in a slightly smaller area of vehicular impact (0.11 acres and 100 feet x 50 feet) farther away from the edge of the water body. Some possible expansion of areas of vehicular impact away from the water body was considered.
- Some specific areas are known to have larger than "average" areas affected by motorized access for dispersed camping and associated motorized access off designated routes (cross-country travel, often by OHVs). There are some specific areas within several subwatersheds across the two forests identified by the interdisciplinary team that are used extensively for dispersed camping and are also notably affected by motorized access off designated routes. These areas, where the impacts of concentrated dispersed use are readily evident over large areas, and generally larger than the "average" assumptions described above for motorized access for dispersed camping, are useful to consider as a sample to compare areas that may be outside of the likely range of effects that an overall average might indicate. Table 3-1 shows the total acres of these areas for each alternative, based on the assumptions of recovery rates.
    - The affected areas to be used for the purpose of a relative comparison of alternatives in this analysis were based on professional observation and assessment of sites by Forest Service recreation specialists, hydrologists, and fisheries and wildlife biologists.
    - These assumptions include a premise that improvement will occur over a portion of the area due to the prohibition on motorized travel off of designed routes and the changed conditions for motorized access for dispersed camping, but that sites would continue to be affected by motorized access for dispersed camping within 300' of an open designated route as well as the actual dispersed camping activities themselves.

[37] This figure was arrived at as an average after consultation with district and forest recreation personnel who assimilated information from their observation of dispersed sites. Although the actual area affected by motorized access may vary depending upon site location and use, this provides a reasonable basis for comparing the relative effects of the alternatives

Table 3-1: Larger Affected Areas by Motorized Access for Dispersed Camping and Motorized Access Off Designated Routes for Alternatives 1-3

Area	Alternative 1 - Acres currently estimated to be affected by motorized access off designated routes and motorized access for dispersed camping	Alternatives 2 and 3 - Acres estimated to be affected by motorized access for dispersed camping and motorized access off designated routes	Rationale for reduction
Deschutes National Forest			
Crane Prairie Reservoir	60	30	50% of affected area is from motorized access off designated routes (cross country travel)
Wickiup Reservoir	910	450	assume that 50% of impacted area is from cross country travel
Meadow Lakes	20	10	10 acres – combination of user created trails to be closed and moving of motorized access for dispersed sites back from waters edge
Metolius/Jack/Canyon Creeks	9	3	decrease in cross country travel
Ochoco National Forest and Crooked River National Grassland			
Whychus Creek Crossing area	20	4	majority of the impact is from cross country travel
McKay Creek	9,000	200	area closure for cross country travel and only designated sites for dispersed camping.

Natural Resource Recovery Rates

- Elimination of motorized access off designated routes and establishing new conditions for motorized access for dispersed camping does not equate to instant or full restoration. Vegetative recovery rates vary by site. For the purposes of this analysis, the following growth rates provide a relatively conservative estimate of the reestablishment of vegetative cover on these denuded sites (i.e., unauthorized routes):
    - 0-5 years – increase of 0-10% vegetative cover on sites or in areas that are no longer accessed via motorized vehicle
    - 5-10 years – 10-25% vegetative cover on these sites
    - >10 years – up to 30% vegetative cover on these sites.

- Soil profile recovery will not occur quickly without active restoration of these sites and will be similar to those rates listed under vegetation, with about 30% of the soil profile recovering after 10 years.
- Riparian sites would not have full recovery due to continued foot traffic use, while those areas that have impacts from motorized travel off designated routes would see more recovery due to their significant decrease in use from both motorized vehicles and foot traffic.

Data Sources

GIS and ArcMap

A geographic information system (GIS) integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. The information can be related to visual data (maps), tabular data (tables, spreadsheets, or data bases) and used to run models (create new data set from existing data based on criteria or specific conditions). ArcMap is a component of the ArcGIS program which was developed by Economic and Social Research Institute (ESRI). This program was used for the processing and presentation of GIS data. Generally, to analyze effects of motorized access off of designated routes and motorized access for dispersed camping, spatial depictions (and related tabular data from attribute database tables) of resources were overlaid onto Forest lands for the different designations under each alternative. Information on the existing conditions and effects of each of the Alternatives analyzed in detail for motorized access were based on the Deschutes and Ochoco Forest Plan Management Area layers and the Travel and Access Maps for the Deschutes and Ochoco National Forest from 1996-1996 (included updates for the Deschutes from 2000).

Forest-level spatial data queried and processed using ArcMap include, but are not limited to the following:

- Motorized access for dispersed camping and motorized access off of designated routes under the existing condition and Alternatives 2 and 3
- Travel routes (including from the Deschutes and Ochoco Travel Management Maps from ca 1996 – 2000)
- Forest Plan Management Areas
- Public Use Restrictions (Forest Plan, Regulatory Orders)
- Dispersed campsites[38]
- Historical vegetation treatments
- Point and polygon fire history records
- Plant association groups (PAGs) and special habitats

Often Forest-level spatial data is derived from resource specific databases and models. These databases include, but are not limited to:

[38] Both Forests and the Grassland have GIS layers that have mapped dispersed sites. In some cases these have been updated recently (1-5 years old) while in others the mapped sites are as many as 20 years old. On both Forests it is known that the GIS layer is incomplete and most likely does not include all existing dispersed sites, but that is does provide a starting point for discussion on proximity and effects. Suitability for motorized access off of designated routes or motorized access for dispersed camping (e.g., slope, vegetation type, proximity to urban areas) was not incorporated into this analysis.

- National Resource Information System (NRIS) – NRIS contains information related to invasive plants, threatened and endangered (TES) species, and other rare or uncommon plants
- Forest Activity Tracking System (FACTS) – FACTS is activity tracking system for all levels of the Forest Service
- Viable Ecosystems Model (Viable) – Viable determines habitat for the various species
- Planning, Appeals, and Litigation System (PALS) – The PALS database is a system used to track process-related planning and decision information
- Schedule of Proposed Action (SOPA) – The SOPA is a quarterly report used by local units of the Forest Service to provide notice of projects being considered at the local level, and to track their progress through the environmental analysis steps
- National Interagency Fire Management Integrated Database (NIFMID)- NIFMID contains information related to historical point fire records such as fire location, cause, size, costs, etc.
- National Roads and Trails Data Base (INFRA) – contains continually updated information on the objective and operational maintenance levels and seasons of use of the designated National Forest System of roads and trails

Air Quality and the Clean Air Act

Executive Summary

There would be no measurable direct or indirect effect to air quality since the net emissions from vehicles, vehicle travel, forest management activities, and wildfires are unlikely to change under the Proposed Action or Alternatives. Under Alternatives 2 and 3, there may be some increased temporary localized air quality impairment from vehicle emissions and fugitive dust. This could occur in areas where there is currently a high level of off-highway vehicle use and within 300' of open designated routes since motorized access off designated routes would be restricted and motorized access for dispersed camping would be limited (to varying degrees), thus concentrating use. This increase in temporary, localized air quality degradation would likely increase over time with Forest use. Presently, this increased effect is assumed to be minimal because motorized use is not desirable and often discourages users when dusty conditions are likely (late summer months). The potential for any of the alternatives to affect air quality indirectly related to wildfires is predicted to have no effect and is not discussed in detail in this analysis. Additionally, the alternatives would have no direct or indirect effect on smoke emissions from Forest management activities, which are managed by the Oregon Department of Forestry as delegated by the Oregon Department of Environmental Quality.

Affected Environment

The 1970 Federal Clean Air Act, as amended in 1977 and 1990 (42 U.S.C. §7401 et seq.), is a legal mandate designed to protect human health and welfare. National Ambient Air Quality Standards are defined in the Clean Air Act as levels of "criteria" pollutants above which may result in detrimental effects on human health and welfare. These criteria pollutants include carbon monoxide, lead, nitrogen oxides, particulate matter (PM10 and PM2.5), ozone, and sulfur dioxide.

State Implementation Plans are adopted by each state to implement the provisions of the Clean Air Act. State Implementation Plans describe the state's actions to achieve and maintain National Ambient Air Quality Standards. If an area consistently does not meet or "attain" the National Ambient Air Quality Standards, it is designated as a non-attainment area and must demonstrate to the public and the Environmental Protection Agency how it will meet standards in the future. The Oregon Department of Environmental Quality regulates and monitors air quality for the State.

Section 160 of the Federal Clean Air Act also requires measures "to preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value." Class I areas include Forest Service and Fish and Wildlife Service wilderness areas over 5,000 acres that were in existence before August 1977, and National Parks in excess of 6,000 acres as of August 1977. Designation as a Class I area allows only very small increments of new pollution above existing air pollution levels. Class I areas have the highest air quality protection standards while Class II have a moderate level of protection.

The Deschutes and Ochoco National Forests include the following Class I areas as identified by the State of Oregon (OAR 340-204-0050):

- Three Sisters Wilderness
- Mount Washington Wilderness
- Mount Jefferson Wilderness
- Diamond Peak Wilderness

Other wilderness areas established after 1977 and national monuments on the Deschutes and Ochoco National Forests (Black Canyon Wilderness, Bridge Creek Wilderness, Mill Creek Wilderness, Mount Thielsen Wilderness, and Newberry National Volcanic Monument) are designated as Class II areas.

On Forest Service Lands in Oregon, the authority to manage smoke emissions from management activities is given to the Oregon Department of Forestry under the Oregon Smoke Management Plan (Oregon Revised Statue 477.013). The Oregon Department of Forestry has the authority to coordinate burning on agricultural and Forest Service lands to minimize impairments and to designate smoke sensitive receptor areas to protect dense population areas or other areas with special legal status from visibility impairments. The acknowledged urban growth boundaries of Bend and Redmond are considered smoke sensitive receptor areas. In these areas, smoke intrusions or the verified entrance of smoke from prescribed burning at ground level is avoided and must be reported (OAR-629-048).

To date, the urban and industrial centers adjacent to the Deschutes and Ochoco National Forests are attaining National Ambient Air Quality Standards (OAR 340-204-0030 and OAR 340-204-0040). Sources of local criteria air pollution on the Deschutes and Ochoco National Forests, include (but are not limited to) construction equipment, vehicles (off-highway and highway legal), wildfires, and forest management activities (i.e., prescribed fires, wildland fire use, pile burning).

Vehicle emissions, particularly those resulting from two-stroke engines (nitrogen oxides, sulfur dioxide, carbon monoxide, ozone, aldehydes, and extremely persistent polycyclic aromatic hydrocarbons) and light weight soil particles or "dust" resulting from vehicle travel on unpaved surfaces (also known as fugitive dust[39]) can contribute to localized air quality degradation, even though National Ambient Air Quality Standards in a larger area are being met (Ouren et al. 2007).

Analysis of Environmental Effects

Alternative 1

Alternative 1, the No Action Alternative, would not reduce the total motorized activity across the Forests or potentially change the location of unplanned human-caused wildfire starts associated with motorized use. However, with predicted increases in Forest use over time, total motorized activity and consequently vehicle emissions, dust generated from vehicle travel on unpaved surfaces, and unplanned human-caused ignitions will also increase. See 'Transportation', 'Recreation', 'Fire Risk', and 'Soils' chapters for more detail related to road conditions, motorized use, fire risk, and dust.

[39] Fugitive dust is created as vehicles disturb and grind soil crusts. The dust is raised into the air by air currents generated by vehicles (Ouren et al. 2007).

Alternatives 2 and 3

Alternatives 2 and 3 affect where motor vehicles can be legally operated on National Forest lands, and thus could potentially affect the location and concentration of vehicle emissions and fugitive dust resulting from vehicle travel on non-paved surfaces. There may be some increased temporary localized air quality impairment from vehicle emissions and fugitive dust in areas where there is currently a high level of OHV use and within 300' of open designated routes since motorized access off designated routes would be restricted and motorized access for dispersed camping would be limited (to varying degrees), as users may be concentrated in these areas.

This increased indirect effect on air quality is assumed to be minimal because none of the alternatives are very unlikely to change the net amount of motorized use across the Forests, and vehicle travel on unpaved surfaces in areas prone to dust, when dusty conditions are likely (late summer months) is not desirable and often discourages users. However, as with Alternative 1, with predicted increases in Forest use over time, total motorized activity and consequently vehicle emissions and dust generated by vehicles would also increase. See 'Transportation' and 'Recreation' chapters for more detail related to effects to motorized users.

Alternatives 2 and 3 could also indirectly affect the location of unplanned human-caused wildfire starts, which could then have a beneficial effect on air quality. Since under Alternatives 2 and 3, motorized access off designated routes and motorized access for dispersed camping would be limited (to varying degrees) to the area within 300' of open designated routes, starts associated with motorized use would be more accessible to suppression resources and potentially more rapidly extinguished, thereby reducing emissions (See 'Fire Risk' section for more detail). However, this effect on air quality from human-caused wildfire that could be attributed to starts from motorized access off designated routes or motorized access for dispersed camping is highly speculative and is therefore not uniquely measurable or definable. The potential for any of the alternatives to affect air quality indirectly related to wildfires is predicted to be no change and is therefore not discussed in further detail in this analysis.

Fire Risk

Executive Summary

This report considers the current condition along with the direct and indirect effects of the Proposed Action and Alternatives on fire risk across the Deschutes and Ochoco National Forests.

Alternatives 2 and 3 will have no direct and some indirect effects on fire risk. Ignitions resulting from ejected sparks or direct contact with vegetation will be limited to motorized users on designated routes and motorized users seeking to access dispersed campsites within 300' of an open designated route. It is not possible to determine if the potential decrease in unplanned human caused ignitions associated with reducing the acreage available for motorized access will exceed the likely increase in Forest use projected into the future. It is most likely that under Alternatives 2 and 3, the total number of unplanned human-caused ignitions across the administrative units per year would likely remain the same or increase with projected increases in Forest use, but would be shifted from across the broader landscape and potentially be more concentrated within 300' of an open designated route. However, Alternatives 2 and 3 would not affect non-motorized travel, so the effect of this is not directly quantifiable. Additionally, Alternatives 2 and 3 could lead to the eventual elimination of user-created roads and trails that could function as preliminary fuel/fire breaks from which to more safely and/or efficiently access an ignition, build a fireline, or perform a burn-out operation, if an ignition were to occur. However, since vegetation recovery will be slow absent any specific rehabilitation efforts, it is expected that these areas will exist for 10 years or more, depending on the site conditions. Under the No Action Alternative, there will be continued access and use of user-created roads and trails for suppression resources and continued human-caused ignitions associated with motorized access across the Forests.

Affected Environment

Human- Caused Ignition Sources

Unplanned human-caused ignitions contribute significantly to the acreage burned across the Deschutes and Ochoco National Forests. Historical point fire occurrence records from the Deschutes National Forest from 1987 to 2007[40] show that nearly half of all ignitions are unplanned and human-caused. On the Ochoco National Forest from 1986 to 2007, unplanned human-caused ignitions are markedly less; accounting for approximately one-quarter of the total ignitions. However, the Deschutes National Forest also encompasses more than two times as much land as the Ochoco National Forest. Regardless of acreage, historical records show that human-caused ignitions per 10,000 acres are greater on the Deschutes National Forest compared to the Ochoco National Forest, highlighting the connection between unplanned human ignitions and proximity to population centers (Table 3-2). Additionally, unplanned human-caused starts on the Deschutes National Forest have generally increased over the last 21 years while those on the Ochoco National Forest have remained somewhat constant (Figure 3-1). Campfires are documented as the most prevalent known causes of unplanned human ignitions across both units.

Table 3-2. Historical fire occurrence on the Deschutes (1987 – 2007) and Ochoco National Forests (1986 – 2007)

Administrative Unit	No. of ignitions (% unplanned human-caused)
Deschutes National Forest	**4,191 (46)**
Equipment	60
Smoking	296
Campfire	833
Debris burning	72
Arson	174
Children	34
Misc. (but human-caused)	460
Not documented	6
Total human*	1,935
Human ignitions/10,000 acres	**12**
Lightning	2,256
Ochoco National Forest (including Crooked River NG)	**2,159 (25)**
Equipment	28
Smoking	63
Campfire	311
Debris burning	13
Arson	17
Children	6
Misc. (but human-caused)	111
Total Human*	549

[40] Fire occurrence records are available from 1980 to present; however records, outside of the years shown in the table, are missing documentation of the fire cause. Forest GIS records, which are derived from the National Interagency Fire Management Integrated Database (NIFMID) are the primary sources of data used to complete this analysis.

Administrative Unit	No. of ignitions (% unplanned human-caused)
Human ignitions/10,000 acres	**8**
Lightning	1,610

- excluding ignitions caused by railroad
-

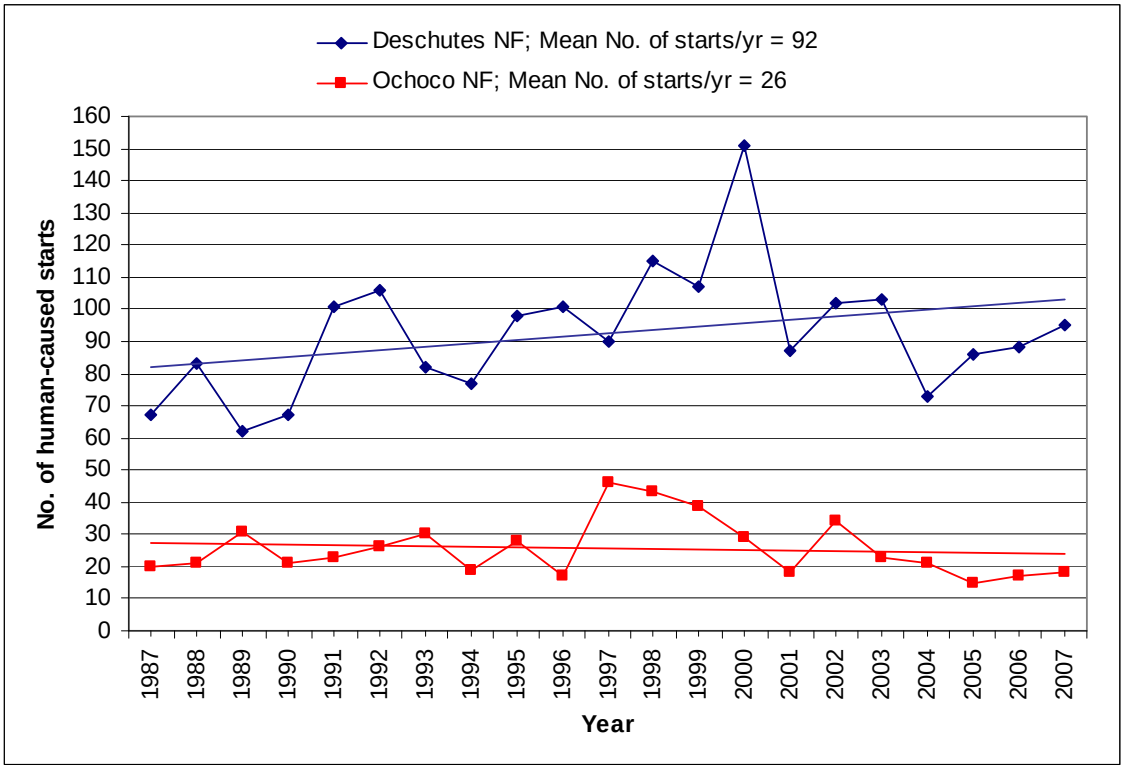


Figure 3-1. Unplanned human-caused ignitions on the Deschutes and Ochoco National Forests

Human-Caused Ignitions and Motorized Access

While the connection between unplanned human-caused ignitions and motorized access cannot be directly inferred from these statistics (see Appendix B-5), literature has shown that vegetation or ground fuels that come in direct contact with a hot engine or exhaust system or a spark from a hot engine or exhaust system may smolder and eventually ignite (USDA 2007, Pitts 2007). Spark arrestors[41], which are required on all vehicles intended for off-highway use on Forest Service lands in Oregon (OPRD 2009), pulverize carbon particles to a size ($\leq$0.023 inches) which decrease the likelihood of glowing or flaming combustion from ejected sparks. Spark arrestors do not decrease the likelihood of ignitions from direct contact with vegetation (i.e., parking on or driving through brush or grass) and during periods of high fire danger, spark arresters will not provide complete protection against exhaust spark fires (USDA 2007). During these periods, Forests may implement use restrictions to prevent ignitions. Sparks can also be generated from activities on designated routes such as loose tow chains, improperly maintained brakes and wheel bearings, exploding solenoids on winches, and driving on flat tires, to name a few.

Unauthorized Roads

[41] Class II OHVs ("Jeeps" or "SUVs") are required to have a operating muffler and exhaust system under 99db which prevents sparks. Class I (quads, 3-wheelers) and Class II (motorcycles) OHVs are required to have a spark arrestor.

Unauthorized roads typically result from low-standard temporary roads either built within the scope of timber sale contracts or from other unplanned, off-road vehicle uses such as gathering firewood and accessing dispersed recreation sites. After their intended use, such roads are typically decommissioned but are often visible as primitive wheel tracks or show up as features in aerial photos. These roads have not been mapped or recorded in the forest transportation database (see "Transportation" section). Depending on the vegetation conditions, these unauthorized routes could function as preliminary fuel/fire breaks from which to more safely access an ignition, build a fire line, or perform a burn-out operation, if an ignition were to occur.

Two sub-affected environments were established for analyzing effects. The first affected environment is the area more than 300' from the centerline of an open designated route proposed to be closed to motorized access off designated routes or proposed to be closed to motorized access for dispersed camping. This affected environment will herein be known as, "the broader landscape".

The second affected environment is the area within 300' of all open designated routes. This area was isolated since all alternatives allow for varying degrees of motorized access to dispersed camping within 300' of designated routes.

Other areas potentially affected by the Alternatives are areas proposed to be open to motorized access for dispersed camping, open to motorized access for dispersed camping seasonally with special provisions (riparian and non-riparian), open motorized access for dispersed camping (seasonally). These acres are nearly coincident with those covered within 300' of open designated routes and are therefore not considered separately in this analysis. For the purpose of this analysis, it was assumed the areas that will continue to be open to motorized access off of designated routes (e.g., rock and gravel pits) will have no effect on fire risk as vegetation (i.e., flammable material) within the footprint of these areas is minimal.

Human starts across the broader landscape account for 37% and 36% of the total human starts across the administrative units (Tables 3-2 and 3-3; Deschutes and Ochoco National Forests, respectively). As with the statistics in Table 3-2, campfires are the most prevalent known cause of unplanned human ignitions, accounting for 60% and 78%, respectively, on the Deschutes and Ochoco National Forests, of the human-caused starts across the broader landscape (in Table 3-3, misc. human not considered). Unplanned human-caused ignitions on both Forests across the broader landscape have decreased slightly over the last 21 years, although there is high annual variability (Figure 3-2). This may indicate that unplanned human-caused ignitions across the broader landscape that require suppression action are related to factors other than increases in population over time, such as ambient conditions or annual use trends.

Table 3-3. Unplanned human-caused ignitions in across the broader landscape (see above) across the administrative units (Deschutes National Forest, 1987 – 2007; Ochoco National Forest, 1986– 2007)

Ignition Cause	Deschutes National Forest	Ochoco National Forest
Not documented	2	--
Equipment	25	10
Smoking	122	29
Campfire	310	125
Debris burning	26	5
Arson	61	5
Children	15	--
Misc. human	161	23
Total	**722**	**197**

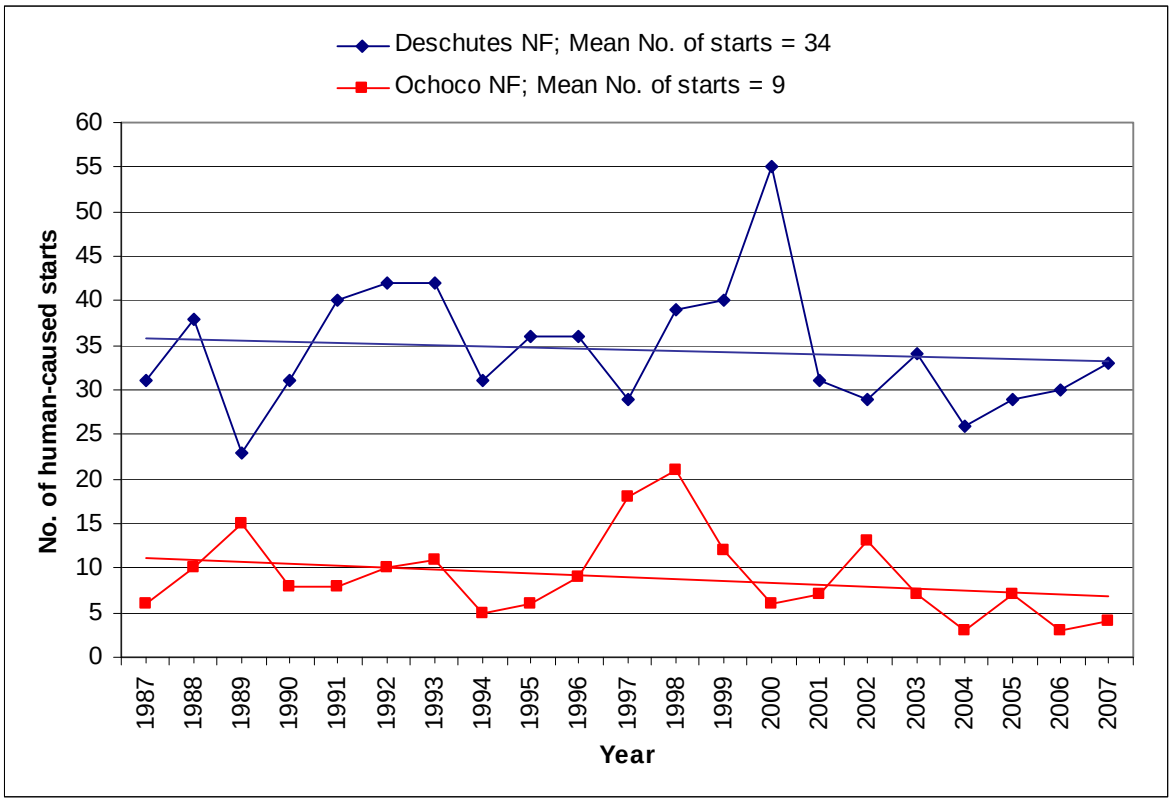


Figure 3-2. Unplanned human-caused ignitions across the broader landscape on the Deschutes and Ochoco National Forests

Human starts within 300' of open designated routes account for 39% and 34%, respectively, on the Deschutes and Ochoco National Forests, of the total human starts across the administrative units (Table 3-4). As with the broader landscape, campfires are the most prevalent cause documented, accounting for 41% and 61%, respectively, on the Deschutes and Ochoco National Forests, of the total human-caused starts within 300' of open designated routes (Table 3-4). Figure 3-3 shows the trends in human-caused starts within 300'of open designated routes. Starts in this area have generally increased over the last 21 years across both Forests, but as with those across the broader landscape, annual variability is high.

Table 3-4. Unplanned human-caused ignitions in the area within 300' of open designated routes across the administrative units (Deschutes National Forest, 1987 – 2007; Ochoco National Forest, 1986– 2007)

Ignition Cause	Deschutes National Forest	Ochoco National Forest
Not documented	2	- -
Equipment	22	2
Smoking	103	17
Campfire	310	114
Debris burning	33	4
Arson	73	3
Children	9	44
Misc. human	206	2
Total	**758**	**184**

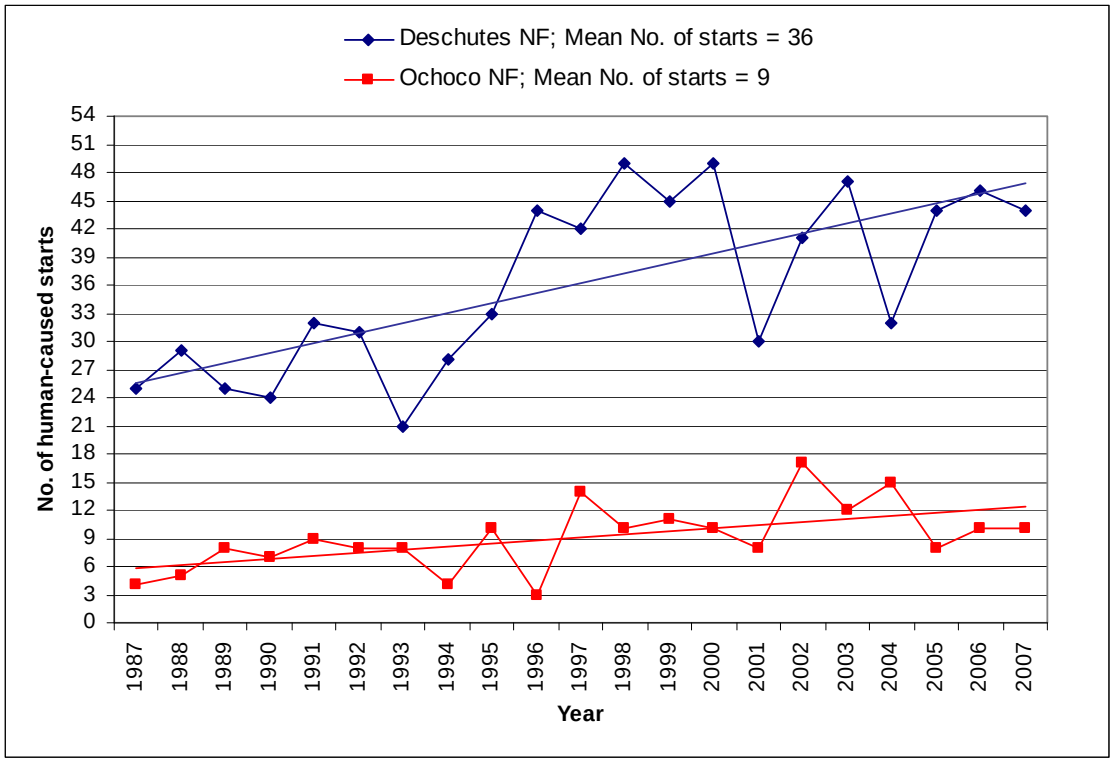


Figure 3-3. Human-caused ignitions within 300' of open designated routes on the Deschutes and Ochoco National Forests

Analysis of Environmental Effects

Alternative 1

As urban populations and Forest use increases into the future, unplanned human-caused ignitions associated with motorized users would likely also increase (especially within 300' of open designated routes; see Figure above), challenging suppression, prevention, and law enforcement resources. As highlighted by Table 3-2, we can expect this effect to be more dramatic on the Deschutes National Forest compared to the Ochoco National Forest due to proximity to larger population centers. However, there will be continued use of unauthorized routes by suppression resources that could function as preliminary fuel/fire breaks from which

to more safely and/or efficiently access an ignition, build a fire line, or perform a burn-out operation (depending on vegetation conditions), if an ignition were to occur.

Alternatives 2 and 3

Although Alternatives 2 and 3 would restrict motorized access for dispersed camping to the area within 300' of open designated routes to varying degrees (see Chapter 2 for more detail), the indirect effects to fire risk can be grouped together since the primary result of implementing either Alternative is the concentration of motorized users on designated routes and within 300' of open designated routes.

There is potential for a decrease in human-caused ignitions if motorized access off designated routes and motorized access for dispersed camping is prohibited across the broader landscape. Ignitions resulting from ejected sparks or direct contact with vegetation will be limited to motorized users on designated routes and motorized users seeking to access dispersed campsites within 300' of an open designated route. While Alternatives 2 and 3 represent a reduction in the acreage available for motorized access, it is not possible to quantitatively infer the effects of this reduction in acreage in terms of fire risk, as statistics do not specifically capture starts associated with motorized access (i.e., starts that are not directly caused by motorized vehicles but are associated with access by motorized vehicles; see Appendix B-5). Additionally, Alternatives 2 and 3 would not affect non-motorized travel, so unplanned human-caused ignitions associated with this user group would not be affected.

It is also not possible to determine if the potential decrease in unplanned human caused ignitions associated with reducing the acreage available for motorized access will exceed the likely increase in Forest use projected into the future (see "Recreation" section). It is most likely that the total number of unplanned human-caused ignitions across the administrative units per year would likely remain the same or increase with projected increases in Forest use, but would be shifted from the broader landscape and potentially be more concentrated in the area within 300' of open designated routes.

Table 3-5 illustrates the potential increase in unplanned human-caused ignitions within 300' of open designated routes for Alternatives 2 and 3 under a range of possible effects (from no shift, up to a 90% shift in unplanned human-caused ignitions from across the broader landscape to the area within 300' of open designated routes). When considering the average number of unplanned human-caused starts per year over the last 21 years, Table 3-5 demonstrates that if 90% of the current average unplanned human-caused ignitions were shifted from across the broader landscape to within 300' of open designated routes, an approximate 86% and 89%, respectively, on the Deschutes and Ochoco National Forests, increase in unplanned human-caused ignitions within 300' of open designated routes could be expected. Likewise, if 25% of the current average number of unplanned human-caused ignitions per year were shifted from across the broader landscape to within 300' of open designated routes, an approximate 24% and 22% increase, respectively, on the Deschutes and Ochoco National Forests, within 300' of open designated routes could be expected. This potential reduction in ignition sources across the broader landscape would facilitate more effective fire patrol for prevention, suppression, and law enforcement resources.

Table 3-5. Potential change in unplanned human-caused ignitions in the area within 300' of open designated routes under a range of possible effects; Alternatives 2 and 3*

		Deschutes National Forest	Ochoco National Forest
		Average # of ignitions	Average # of ignitions
Existing Condition and Alternative 1 No shift	Across the broader landscape	34	9
	within 300' of designated routes	36	9
Percent of starts within 300' of open designated routes		**51**	**50**
Alternatives 2 and 3	Across the broader	3	1

		Deschutes National Forest	Ochoco National Forest
		Average # of ignitions	Average # of ignitions
90% Shift	landscape		
	within 300' of designated routes	67	17
Percent increase in starts within 300' of open designated routes		**86**	**89**
Alternatives 2 and 3 75 % Shift	Across the broader landscape	8	2
	within 300' of designated routes	62	16
Percent increase in starts within 300' of open designated routes		**72**	**78**
Alternatives 2 and 3 50% Shift	Across the broader landscape	17	4
	within 300' of designated routes	53	14
Percent increase in starts within 300' of open designated routes		**47**	**56**
Alternatives 2 and 3 25% Shift	Across the broader landscape	25	7
	within 300' of designated routes	45	11
Percent increase in starts within 300' of open designated routes		**25**	**22**

*Note that the potential increase in unplanned human-caused ignitions in the future within the area within 300' of open designated routes was not incorporated into this assessment due to the high annual variability in ignitions (Figure 3-3).

Alternatives 2 and 3 could also lead to the eventual elimination of user-created routes that could function as preliminary fuel/fire breaks from which to more safely/efficiently access an ignition, build a fire line, or perform a burn-out operation, if an ignition were to occur. However, these unauthorized routes will likely exist for 10 years or more absent any rehabilitation efforts (See 'Assumptions and Methodologies') and will be used during suppression efforts, if necessary.

Public Safety

Executive Summary

This section summarizes the analysis of the effects from implementing the actions proposed in this EIS on public and safety.

Under the action alternatives all motorized vehicle use will be restricted to designated routes, and a motorized mixed use analysis is required to evaluate the suitability for allowing both highway-legal and non-highway legal vehicles on the same designated routes. Some roads that are currently available for mixed motorized use will be changed to allow only highway-legal vehicles if either action alternative is implemented. As a consequence of this change, some connectivity between traditional OHV use areas may be changed or lost. The OHV rider may need to load and transport the OHV from one geographic location to another in certain areas.

Preliminary analyses indicate that approximately 181 miles of roads on the Deschutes National Forest and 125 miles of roads on the Ochoco National Forest and Crooked River National Grassland that are currently available for mixed motorized use will be changed to only allow highway-legal vehicles if either action alternative is implemented.

Affected Environment

There are approximately 8,000 miles of roads under Forest Service jurisdiction across Central Oregon on the Deschutes and Ochoco National Forests, and the Crooked River National Grassland that are open and available for public use in motorized vehicles. Of those, some are available year round to all types of motor vehicles, some are only available during specific time periods, and some are only available to certain types of vehicles.

When open for use, most roads are open to all types of motor vehicles. However, some roads are restricted to highway-legal vehicles only. Some roads are not suitable for motorized mixed use due to concerns for operator safety or are used for administrative purposes such as campground roads, roads into administrative sites, roads through sensitive areas, etc. Motorized mixed use is defined as having both highway-legal and non-highway-legal vehicles operating on the same road at the same time. Non-highway-legal vehicles include any type of standard vehicle or OHV that is not street legal. On the Deschutes National Forest, roads that currently allow only highway-legal vehicles include all Highway Safety Act roads, roads within the Newberry National Volcanic Monument, and roads within the East Fort Rock OHV area. On the Ochoco National Forest, roads that currently allow only highway-legal vehicles are primarily the Highway Safety Act roads. Table 3-6, Miles of Open FS Roads by Vehicle Type, shows the amount of roads currently open to all vehicles and those that are only open for highway-legal vehicles.

Table 3-6: Miles of Open FS Roads by Vehicle Type

Type of Vehicle Allowed	Deschutes NF	Ochoco NF	Crooked River NG	Total Miles
Open to All Motor Vehicles	5,362	1,388	260	7,010
Open to Highway Legal Vehicles Only	770	242	2	1,014
Totals:	**6,132**	**1,630**	**262**	**8,024**

Current Use

The existing policy on the Deschutes and Ochoco National Forests and Grassland, has been to allow OHV use on all maintenance level 2 roads (high clearance vehicle roads) and prohibit OHV use on all maintenance level 3, 4, & 5 roads, which are the roads maintained for passenger car traffic, and thus consistent with ORS 821.055. This policy has been described to the public on the forest visitor maps, OHV area maps, and other recreation information sources. The only exceptions to the current policy are in places where OHV use on roads is specifically prohibited in areas such as the Newberry National Volcanic Monument, and the OHV specialized trail areas.

Other than occasional contacts by law enforcement or contacts in OHV Trail areas, no specific information or educational outreach to the public regarding the use of OHV's on paved or two-lane gravel roads has been developed because in the past these roads fell entirely within the maintenance level 3, 4, and 5 category, (i.e., not available for OHV use). However, with the decline in maintenance budgets in recent years, the Forests have lowered maintenance levels on many roads so that there are now several two-lane gravel roads and even a few paved roads in the maintenance level 2 category.

With the new Regional Policy regarding the need to perform an Engineering Analysis on all roads before allowing motorized mixed use on the motor vehicle use map, these "high-use" level 2 roads are being examined for suitability for having both highway-legal and non-highway-legal vehicles on them in the future.

Regional Policy

By Regional Forester Letter, "Procedures for Engineering Analysis of Motorized Mixed Use", dated August 10, 2006, the Forest Supervisors in Region 6 were directed as follows:

The enclosed letter from the Washington Office expands on and supplements the Chief's interim guidance, as a result of a recent Regional Engineers' meeting to discuss designation of National Forest System (NFS) roads for motorized mixed use under the travel management rule.

The following supplements this guidance for Region 6.

When Engineering Analysis is Required:

Even when State law allows motorized mixed use, you must follow the guidance in EM-7700-30 to determine if allowing motorized mixed use on NFS roads is consistent with management objectives, and makes a reasonable accommodation for the public's safety.

Decisions on motorized mixed use are the responsibility of the line officer. The designated engineer analyzes the information on the road and road use, including crash probability and severity, and presents that information, along with any mitigation that could potentially lower the risks to the responsible official.

State laws in Oregon and Washington require no minimum age to operate some classes of OHVs. Because of the potential risks, an engineering analysis (EM-7700-30) must be conducted on all roads being considered for mixed use regardless of maintenance level. The level of the analysis should be appropriate for the roads being analyzed. For example, similar roads at a maintenance and operational level that justifies an abbreviated analysis may be combined utilizing Exhibit 1 Documentation for Engineering Judgment of Motorized Mixed Use on National Forest System Roads as described in EM-7700-30.

Roads currently open to mixed use that have a documented mixed use analysis do not need to be revisited. Engineering analysis is required for roads which have been open to mixed use and no documented engineering analysis has been completed.

These guidelines and the procedures in FSH 7709.55, chapter 30 have been used to analyze motorized mixed use for the majority of roads proposed for motorized mixed use on the Deschutes and Ochoco National Forests. The roads that are expected to continue to be open to motorized mixed use on the Bend-Fort Rock Ranger District are included in the tables and maps in this section, but the totals could change slightly upon completion of the analyses.

Analysis of Environmental Effects

Alternative 1

Alternative 1, the no action alternative, would not prohibit motorized travel where it is not already restricted or prohibited by law, regulation, policy, order, Forest Plan direction, site-specific decision or agreement. There would be no change to existing designated routes for class of vehicle, areas open to motorized access, or seasons of use for motorized access.

There would be no direct or indirect effects to public use of the road system from implementing the no action alternative. Roads would continue to be used as they are presently. Public use would remain as it is today, and motorized mixed use would continue on roads where it is currently allowed. Based on the mixed use analysis recently completed, this could result in slightly over 300 miles of road where mixed use may present a risk to public safety by allowing OHV use on roads that support high speed travel by motor vehicles and where site distances are limited.

Alternatives 2 and 3

Under both Alternatives 2 and 3, all motorized travel would be prohibited off of designated routes. Motorized vehicles would still be allowed to access dispersed camp sites within 300 feet of designated routes where that use is currently allowed. Motorized vehicles would still be allowed to use designated routes where they are currently allowed. However, for all roads where motorized mixed use would occur, an Engineering Analysis to determine suitability for that mixed use would be required prior to including those routes on the motor vehicle use map.

Existing legal uses on established system roads would continue, while off-road, cross-country, motorized vehicle use and motorized use on unauthorized, non-system roads would be prohibited. No system roads that are currently open to public use, and do not have an existing NEPA decision to close them, would be closed as a result of this decision. However, some roads that currently allow motorized mixed use will be changed to only allow highway-legal vehicles.

Preliminary analyses indicate that approximately 181 miles of roads on the Deschutes National Forest and 125 miles of roads on the Ochoco National Forest, that are currently available for mixed motorized use, will be changed to only allow highway-legal vehicles if either action alternative is implemented. This could reduce the potential risk to public safety on slightly over 300 miles of road where motorized mixed use may currently present a safety risk by allowing OHV use on roads that support high speed travel where site distances are limited.

Table 3-7, Expected Change in Roads Open to Highway Legal Vehicles**,** shows the mileage differences between the current highway-legal system and the expected highway-legal system under the action alternatives. These numbers may vary slightly upon completion of the analyses.

Table 3-7: Expected Change in Roads Open to Highway Legal Vehicles

FOREST	Open to HWY Legal Only			Open to Motorized Mixed Use			OPEN Miles
	Existing	Alt 2,3	Change	Existing	Alt 2,3	Change	
Deschutes NF	770	951	181	5,362	5,181	-181	6,132
Ochoco NF	242	367	125	1,388	1,262	-125	1,630
Crooked River NG	2	2	0	260	260	0	262
Totals	**1,014**	**1,320**	**306**	**7,010**	**6,703**	**306**	**8,024**

Connectivity of Routes

With the implementation of either of the action alternatives, where motorized vehicle use will be restricted to designated routes and where some of those designated routes will be limited to highway-legal vehicles only, there will be some areas where traditional OHV use areas will no longer be connected. Maps in Appendix A-2 show the roads that are currently restricted to highway-legal vehicles only and those that are expected to be changed to highway-legal only status upon completion of the analyses. The proposed additions to the highway-legal only system on the Deschutes National Forest will not have as much of an effect on loss of connectivity as it will on the Ochoco National Forest due to the higher road densities on the Deschutes, (i.e., there are more opportunities for alternate routes on the Deschutes). On either Forest, the consequences of losing connecting routes between desired destinations is that the user will have a reduced number of loop riding options and may have to load the OHV on a trailer or pickup to get from one location to another in certain situations.

Transportation

Executive Summary

This section summarizes the analysis of the effects from implementing the actions proposed in this EIS on the National Forest Road System. Under the proposed action, all motorized vehicle use will be restricted to designated routes, and an Engineering Analysis will be required to evaluate the suitability for allowing both highway-legal and non-highway-legal vehicles on the same designated routes, (i.e., motorized mixed use).

There would be no direct or indirect effects to the current road system from implementing the no action alternative. Roads would continue to be used as they are presently, and public use would remain as it is today.

Alternatives 2 and 3 would be expected to increase overall road use in areas where there is currently a high level of off-road motorized vehicle use. The effect of this increased use would be an increase in surface wear on some roads which may result in a need for additional maintenance work.

Preliminary analyses indicate that approximately 181 miles of roads on the Deschutes National Forest and 125 miles of roads on the Ochoco National Forest that are currently available for mixed motorized use will be changed to only allow highway-legal vehicles if either action alternative is implemented. As a consequence of this change, some connectivity between traditional OHV use areas may be changed or lost.

Affected Environment

There are currently over 11,400 miles of roads under Forest Service jurisdiction across Central Oregon on the Deschutes and Ochoco National Forests, and the Crooked River National Grassland. Of these roads there are approximately 8,000 miles of roads that are open and available for public use in motor vehicles. In addition to Forest Service roads, there are approximately 1,880 miles of State and County roads that provide for public access through and within the Central Oregon forests. There are also many miles of privately owned roads that are not tracked in the Forest Service inventory. Table 3-8 shows the miles of road within the Central Oregon Forests and Grassland that are either under Forest Service jurisdiction or are under the jurisdiction of the State or Counties.

Table 3-8: Road Mileage of Central Oregon Forests and Grassland:

Road System	Deschutes NF	Ochoco NF	Crooked River Nat'l Grassland	Total Miles
Forest Service Roads	8,182	2,935	315	11,432
State / County Roads	578	400	899	1,877
Totals:	**8,760**	**3,335**	**1,214**	**13,309**

Most of the National Forest System Roads on the Ochoco and Deschutes National Forests were developed over the years in support of various resource management activities including timber harvest, mineral extraction, recreation, and for administrative purposes.

There are currently 8,182 miles of Forest Service roads in the Deschutes National Forest road inventory. This number includes all standards of roads ranging from two lane paved arterials to single lane native surfaced roads, and includes all roads whether they are open or closed to motor vehicle use. Most of the Deschutes forest has gentle terrain which made road construction inexpensive and convenient; thus, the forest has been roaded extensively over the years. There is rarely a need to construct a new road on the Deschutes.

The Ochoco National Forest has approximately 2,935 miles of Forest Service roads. Most of the transportation system on the Ochoco National Forest was developed on the more gentle slopes found on the southern portions of the Forest. This part of the Forest, (approximately two-thirds of the total area), has the transportation system needed to provide access for most present and future management activities. The

northern one-third of the Ochoco National Forest has a less extensive transportation system and more difficult terrain for road construction.

There are only 315 miles of Forest Service roads on the Crooked River National Grassland. This relatively small number of roads under Forest Service jurisdiction is due to the fact that the primary access to the Grassland is provided by the State and County road systems. Road jurisdiction in the Grassland is somewhat unusual because the Grassland didn't come into existence until 1960. Prior to that, the lands were privately owned and many of the roads were constructed by the county or private landowners to provide access to the original homesteads. After the land was acquired by the Forest Service, all roads that were previously used by the public remained under county jurisdiction. Most of the main roads through the Grassland are dedicated county roads that are maintained by the county, but many of the other roads are designated as "local access roads" or "public use roads", where the County still has jurisdiction over the roads but does not spend maintenance funds on them. The remaining 315 miles of Forest Service roads are generally very low standard dirt roads that access range allotments throughout the Grassland. These roads are normally suitable only for high clearance vehicle use and are impassable or closed seasonally during wet weather.

Road System Classifications

There are many ways to categorize different groups of roads in the Forest Service road system. Five of the primary ways that will be used in discussions throughout this section are by Functional Class, Maintenance Level, Highway Safety Act, Surface Type, and Unauthorized.

Functional Class

Functional Class is the way a road services land and resource management needs, and the character of service it provides. (FSH 7709.54, Forest Transportation Terminology Handbook)

- **Arterial Road**. A forest road that provides service to large land areas and usually connects with other arterial roads or public highways.
-
- **Collector Road**. A forest road that serves smaller land areas than an arterial road. Usually connects forest arterial roads to local forest roads or terminal facilities.
-
- **Local Road**. A forest road that connects terminal facilities with forest collector, forest arterial or public highways. Usually forest local roads are single purpose transportation facilities.

Table 3-9 shows the distribution of functional classes on the forest service road system in Central Oregon. Approximately 2,432 miles, or 21 percent of the total road system, are main roads (arterial and collector roads). The remaining 9,000 miles (79 percent) of roads are local roads that are generally designated for high clearance access.

Table 3-9: Forest Service Road Miles by Functional Class

FUNCTIONAL_CLASS	Deschutes NF	Ochoco NF	Crooked River NG	Total
A - ARTERIAL	296	229		526
C - COLLECTOR	1,450	447	9	1,906
L - LOCAL	6,435	2,259	306	9,000
Totals:	**8,182**	**2,935**	**315**	**11,432**

Maintenance Levels

Maintenance Levels define the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria. (FSH 7709.58, Transportation System Maintenance Handbook)

- **Maintenance Level 1**: Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed 1 year. Basic custodial maintenance is performed to keep damage to adjacent resource to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are "prohibit" and "eliminate". Roads receiving level 1 maintenance may be of any type, class or construction standard, and may be managed at any other maintenance level during the time they are open for traffic. However, while being maintained at level 1, they are closed to vehicular traffic, but may be open and suitable for non-motorized uses.
- **Maintenance Level 2**: Assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level. Appropriate traffic management strategies are either: (1) discourage or prohibit passenger cars or (2) accept or discourage high clearance vehicles.
- **Maintenance Level 3**: Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material. Appropriate traffic management strategies are either "encourage" or "accept." "Discourage" or "prohibit" strategies may be employed for certain classes of vehicles or users.
- **Maintenance Level 4**: Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated. The most appropriate traffic management strategy is "encourage." However, the "prohibit" strategy may apply to specific classes of vehicles or users at certain times.
- **Maintenance Level 5**: Assigned to roads that provide a high degree of user comfort and convenience. Normally, roads are double-lane, paved facilities. Some may be aggregate surfaced and dust abated. The appropriate traffic management strategy is "encourage."

Table 3-10 shows the distribution of maintenance levels on the forest service road system in Central Oregon. Approximately 6 percent of the road system is in the Maintenance Level 3, 4, and 5 categories, which means they are open to public use and are maintained for standard passenger cars. Approximately 64 percent of the road system is maintained for high clearance vehicles only (Maintenance Level 2), and approximately 30 percent of the roads are currently closed to motor vehicle use, (Maintenance Level 1).

Table 3-10: Forest Service Road Miles by Maintenance Level

OPER_MAINT_LEVEL	Deschutes NF	Ochoco NF	Crooked River NG	Total Miles
1 - BASIC CUSTODIAL CARE (CLOSED)	2,050	1,305	53	3,408
2 - HIGH CLEARANCE VEHICLES	5,700	1,410	260	7,370
3 - SUITABLE FOR PASSENGER CARS	271	135		406
4 - MODERATE DEGREE OF USER COMFORT	122	30	2	154
5 - HIGH DEGREE OF USER COMFORT	39	55		94
Totals:	**8,182**	**2,935**	**315**	**11,432**

Highway Safety Act Roads

Forest Service maintenance level 3, 4, and 5 roads are subject to the Highway Safety Act of 1966. The Forest Service maintains a Memorandum of Understanding (MOU) with the Federal Highway Administration requiring that certain safety standards from the Highway Safety Act be met on all roads “open to public travel”, as defined in the MOU. Maintenance level 3-5 roads are given this designation

because they are generally available and maintained for low-clearance passenger car use. The present Highway Safety Act Road System includes 220 miles on the Ochoco National Forest, 2 miles on the Crooked River National Grassland, and 432 miles on the Deschutes National Forest.

Table 3-11: Roads Subject to the Highway Safety Act

MAINTENANCE REQUIREMENTS	Deschutes NF	Ochoco NF	Crooked River NG	Total Miles
Passenger Cars and Subject to the HSA	432	220	2	654
High Clearance Vehicles Only	7,750	2,715	313	10,778
Totals:	**8,182**	**2,935**	**315**	**11,432**

Surface Types

Forest Service roads are typically grouped into four basic surface types:

- **Paved** roads include roads with any type of asphalt surface materials; either bituminous surface treatments (BSTs) or asphalt cement concrete (AC).
- **Aggregate** surface roads include any type of crushed rock or screened rock surfacing. Also referred to as gravel roads.
- **Improved** surface roads may have any type of select borrow material imported and placed on the surface to help stabilize them. Typically this is a larger rocky material that is not processed through a crusher but may be grid rolled to reduce the particle size on the road. On the Deschutes NF, most improved surface roads are made of cinder material.
- **Native** roads are not surfaced. They are constructed entirely out of the native soil and rocky materials that are encountered during construction. No materials are brought in to cover them. Sometimes referred to as dirt roads.

Table 3-12: Forest Service Road Miles by Surface Type

SURFACE_TYPE	Deschutes NF	Ochoco NF	Crooked River NG	Total Miles
AC - ASPHALT	198	91	2	291
AGG - CRUSHED AGGREGATE / GRAVEL	340	590	1	931
IMP - IMPROVED NATIVE MATERIAL	1,155	499	7	1,661
NAT - NATIVE MATERIAL	6,489	1,755	305	8,549
Totals:	**8,182**	**2,935**	**315**	**11,432**

Unauthorized Roads

Unauthorized roads do not fit into any of the classification categories described above and typically result from low-standard temporary roads either built within the scope of timber sale contracts or from other unplanned, off-road vehicle uses such as gathering firewood and accessing dispersed recreation sites. After their intended use, such roads are typically decommissioned but are often visible as primitive wheel tracks or show up as features in aerial photos. These roads have not been mapped or recorded in the forest transportation database.

Road Maintenance

Currently, the overall condition of the road system on the two Forests and Grassland is poor. Road maintenance funding has declined substantially over the past decade for both forests to a point where it is only a fraction of what is needed to fully maintain the road system to the objective standards.

In addition to the large discrepancy between our present road maintenance funding and our projected road maintenance needs, the amount of road maintenance work traditionally performed by timber purchasers has been dramatically reduced over the past two decades. The reduced opportunity for sharing road maintenance

responsibilities with timber purchasers, both in terms of work performed and collection deposits will continue to compound our lack of ability to keep up with maintenance needs.

This condition is becoming very evident in our backlog of both surface rock replacement on our main roads and brushing on our local roads. The crushed aggregate and cinder surfacing on most of our main roads is worn out. We have traditionally shared the work and expense of replacing surfacing materials with timber purchasers during active timber sales. With the dramatic decrease in both the Forest Service Capital Investment Program and in the timber program, we have very limited means of replacing surface materials on our roads. This condition is becoming severe on both forests and can only get worse without new funding sources being found. We are also noticing a profound increase in the number of our objective maintenance level 2 roads that we can no longer drive in a full sized vehicle due to encroaching brush. These roads were typically brushed out as part of our active timber sales, but many have not had project use in years. We expect to see a significant portion of these objective maintenance level 2 roads move into an operational level 1 (closed) category due to lack of ability to maintain them.

Beginning in 1998, the Forests began conducting road condition surveys to determine the annual costs necessary to fully maintain the road system to standard. In addition, any deferred maintenance work items necessary to bring the roads back to standard is recorded and documented. In 2003 the Central Oregon Forests conducted a Forest-Wide Roads Analysis and evaluated the deferred maintenance needs (to bring the road systems back up to standard), and annual maintenance costs (to keep it maintained in a safe and environmentally sound condition) on the forests.

For the Deschutes National Forest, we would need approximately $33 million dollars for deferred maintenance and approximately $2.1 million for annual maintenance. For the Ochoco National Forest we would need $37 million for deferred maintenance and $1.6 million for annual maintenance. Although it would be desirable to request the funding necessary to accomplish this work, it is not anticipated that increases in funding of this magnitude are going to be available anytime in the foreseeable future. Therefore, options for managing the road systems are limited to either reducing the mileage and/or standard of roads to maintain, or continuing to prioritize maintenance work on the existing system and accept a continued increase in our deferred maintenance backlog.

Public Use

There are approximately 8,000 miles of roads under Forest Service jurisdiction across Central Oregon on the Deschutes National Forest, the Ochoco National Forest, and the Crooked River National Grassland that are open and available for public use in motorized vehicles. Of those, some are available year around to all types of motor vehicles, some are only available during specific time periods, and some are only available to certain types of vehicles.

Seasons of Use

Most roads are open and available for motorized vehicle use during the snow-free season. However, there are a variety of reasons why use on some roads is restricted for specific time periods during the year. The reasons range from cooperative road management areas during hunting seasons (e.g., Green Dot Systems), and other protection for wildlife during the winter season, spring calving/fawning periods, bird nesting periods, etc. Table 3-13 shows the number of miles of road that are currently open all year, or that have at least one seasonal restriction on use during the year.

Table 3-13: Miles of Open FS Roads by Season of Use

OPEN TO PUBLIC USE	Deschutes NF	Ochoco NF	Crooked River NG	Total Miles
Open All Year	5,230	1,367	14	6,611
Open Seasonally	902	263	248	1,413
Totals:	**6,132**	**1,630**	**262**	**8,024**

Vehicle Types

When open for use, most roads are open to all types of motor vehicles. However, some roads are restricted to highway-legal vehicles only. Some roads are not suitable for motorized mixed use due to concerns for operator safety or are used for administrative purposes such as campground roads, roads into administrative sites, roads through sensitive areas, etc. Motorized mixed use is defined as having both highway-legal and non-highway-legal vehicles operating on the same road at the same time. Non-highway-legal vehicles include any type of standard vehicle or OHV that is not street legal. On the Deschutes National Forest, roads that currently allow only highway-legal vehicles include all Highway Safety Act roads, roads within the Newberry National Volcanic Monument, and roads within the East Fort Rock OHV area that are not specifically designated and signed to allow motorized mixed use. On the Ochoco National Forest, roads that currently allow only highway-legal vehicles are primarily the Highway Safety Act roads. Table 3-14 shows the amount of roads currently open to all vehicles and those that are only open for highway-legal vehicles. Table 3-13 compares open roads with both seasons of use and type of vehicles allowed.

Table 3-14: Miles of Open FS Roads by Vehicle Type

Type of Vehicle Allowed	Deschutes NF	Ochoco NF	Crooked River NG	Total Miles
Open to All Motor Vehicles	5,362	1,388	260	7,010
Open to Highway Legal Vehicles Only	770	242	2	1,014
Totals:	**6,132**	**1,630**	**262**	**8,024**

Table 3-15: Miles of Open FS Roads by Season of Use and Vehicle Type

FOREST	Open to All Vehicles		HWY Legal Only		Total Miles
	All Year	Seasonal	All Year	Seasonal	
Deschutes NF	4,552	810	678	92	6,132
Ochoco NF	1,125	263	242	0	1,630
Crooked River NG	12	248	2	0	262
Totals:	**5,689**	**1,321**	**922**	**92**	**8,024**

Analysis of Environmental Effects

Alternative 1

Alternative 1, the no action alternative, would not prohibit motorized travel where it is not already restricted or prohibited by law, regulation, policy, order, Forest Plan direction, site-specific decision or agreement. There would be no change to existing designated routes for class of vehicle, areas open to motorized access, or seasons of use for motorized access. There would be no Forest Plan amendments to change motorized access as a result of this decision.

There would be no direct or indirect effects to the road system from implementing the no action alternative. Roads would continue to be used as they are presently. Public use would remain as it is today, and maintenance needs would continue to accumulate and outweigh current maintenance budgets.

Alternatives 2 and 3

With the implementation of either of the action alternatives where motorized vehicle use will be restricted to designated routes, there will be an expected increase in overall traffic on some roads. This effect is expected to mostly occur near areas that are currently experiencing high levels of off-road use. These areas include

unauthorized trail systems near subdivisions and other population centers adjacent to or within the forest boundary. The effect of this increased use would be more wear and tear on the higher used roads resulting in an increased need for road surface maintenance. The potential for this additional non-highway-legal vehicle traffic on the road system is being considered and reflected in the engineering analysis for designation of motorized mixed use routes.

No system roads that are currently open to public use that do not have an existing decision to close them, would be closed as a result of this decision. However, as part of the 2005 Travel Management Rule, the Regional Forester of the Pacific Northwest Region issued a letter that requires an Engineering Analysis to be performed on any road that will be designated open to motorized mixed use on the Motor Vehicle Use Map. As a consequence of this rule, some roads that currently allow motorized mixed use will be changed to only allow highway-legal vehicles only. Maps in Appendix A-2, show the roads that are currently restricted to highway-legal vehicles only and those that are expected to be changed to highway-legal only status upon completion of the Motorized Mixed Use Analyses. Table 3-16, Expected Change in Roads Open to Highway Legal Vehicles below, shows the mileage differences between the current highway-legal system and the expected highway-legal system under the action alternatives. (See the Public Safety Section of this report for further discussion of the Motorized Mixed Use Analysis).

Table 3-16: Expected Change in Roads Open to Highway Legal Vehicles

Forest	Open to HWY Legal Only			Open to Motorized Mixed Use			Open Miles
	Existing	Alt 2,3	Change	Existing	Alt 2,3	Change	
Deschutes NF	770	951	181	5,362	5,181	-181	6,132
Ochoco NF	242	367	125	1,388	1,262	-125	1,630
Crooked River NG	2	2	0	260	260	0	262
Totals:	**1,014**	**1,320**	**306**	**7,010**	**6,703**	**-306**	**8,024**

Scenery Resources

Executive Summary

The scenic resources on the Deschutes and Ochoco National Forests and Crooked River National Grassland were inventoried under the Forest Service's Visual Management System (VMS). Both the Deschutes and Ochoco National Forest Land and Resource Management Plans (LRMP) identify Visual Quality Objectives for many Management Areas. This section summarizes the analysis of the effects from implementing the actions proposed in this EIS on Scenic Views and Visual Management areas.

Motorized use off designated routes or motorized access for dispersed camping can indirectly affect scenic quality by denuding vegetation, and causing visible "tracks" or "areas" that often alter the form, line, color, and texture of the landscape. This is generally most evident in foregrounds along popular use areas such as riparian areas or hill climb areas. Scenic views would not be directly altered by any of the Alternatives considered. Alternatives 2 and 3 would have more potential indirect benefits to scenery than Alternative 1.

In Alternatives 2 and 3, limiting motorized access for dispersed camping to only designated, defined or existing campsites (under special provisions), and prohibiting the creation of new motorized routes to access new or existing campsites would have a beneficial effect by reducing visual impacts within view corridors. Requiring a 30' setback from waterbodies and stream channels would facilitate vegetation recovery in these areas, thus providing a beneficial effect by contributing to the improvement of the foreground area seen adjacent to major forest roads and from dispersed campsites.

Affected Environment

Scenic views are most affected by actions that alter the form, line, color, and texture of the landscape. There are no Forest Plan Standards and Guidelines that relate to the uses of existing designated routes. Visual quality objectives are measured by the degree of change or alteration of the landscape.

Scenic Analysis Area

Portions of the Forests are visible from several important viewpoints in and around the greater Bend, Redmond, Prineville, and Madras areas as well as from State Highways 20, 97, 126, 22, and 31, and Forest roads and trails. Scenic Views Management Areas are generally along these and other major Forest arterials or collector roads. See Table 3-17 - Scenic Corridors on the Deschutes and Ochoco National Forests and the Crooked River National Grassland for a detailed list. Visual Quality Objectives in these areas are generally Foreground Retention or Partial Retention and Middleground Partial Retention. These areas, as seen from selected travel routes and use areas are to be managed so that, to the casual observer, results of activities are evident but are visually subordinate to the landscape.

Recreation and Scenic Resources

Central Oregon has a history of being uniquely situated to "preserve and provide interpretation of unique geological and cultural areas for education, scientific and public enjoyment purposes" (Deschutes National Forest, 1990 Forest Plan LRMP, 4-90). Recreation and scenic resources, including tourism industry, are increasingly being touted as a mainstay of the local economy within Central Oregon. Winter and summer recreation expenditures have added an element of stability to the otherwise volatile wood products based economy of the past (Deschutes National Forest, 1990 Forest Plan LRMP, 2-2).

Motorized Use on National Forest Lands

Nearly all Forest visitors use vehicles to get to their preferred activities and settings, whether it is a hiking or equestrian trailhead, a fishing spot, or a favorite campsite. For many people, their vehicle is just the mode of transportation used to access their recreational activity. For others, the vehicle use itself is the activity. Use of off-highway-vehicles (OHV's) on National Forest lands is a popular activity and use has increased dramatically over the past decade. Due to this increase, there has been an similar increase in motorized access off designated routes and the creation of many miles of unauthorized "user created" routes. See the Recreation Section for more detailed information and statistics on this recreational use.

Motorized Use for Dispersed Camping

Dispersed camping and day use picnicking are popular activities on the Forest, accounting for approximately 14% of overall participation on the Deschutes National Forest and 27% on the Ochoco National Forest and Crooked River National Grassland. Many visitors prefer a more secluded experience than developed campgrounds and picnic areas offer. The many roads, meadows, creeks, ponds, and lakes found on the Forest offer extensive opportunities for dispersed car and trailer camping and picnicking. Many sites have existed for years, and have been used by the same families year after year. Some of these sites are being accessed off of roads that have been administratively closed, but have not been physically closed on the ground, and may not be posted as closed, so appear to be "open". See Recreation Section for more details and statistics regarding this activity.

Landscape Character Description

The Central Oregon landscape, encompassing the Deschutes and Ochoco National Forests and Grassland, is well known for its open-park like stands of large-yellow bark Ponderosa pine, spectacular snow-capped mountain peaks, open grassy meadows, crystal clear lakes and streams, fish and wildlife species, wondrous and unusual geological landforms, spectacular scenery, and world class outdoor recreation opportunity and

experience. All these elements combined and contributed to a reputation that the Oregon high desert landscape is a world class destination that brings in over 5 million visitors each year. The area's popularity is expected to continue to grow and expand in the future along with increasing population.

Landscape Character Goal and Objective

The Landscape Character goal for the analysis area is to achieve a natural appearing landscape, such as open park-like stands, where management directions, the desired future conditions, and social and ecological framework are met (Forest Plan, Deschutes LRMP MA-9, MA-19 - MA-28, and Ochoco NF MA-F26).

Scenic Quality Objective

Scenic quality within the analysis area would be natural appearing character where various line, form, color and texture elements are found within the landscape. Human alterations, in general, would be subordinate and conform to natural appearing landscape characteristics. Character trees, snags and small openings, to highlight special features within the landscape, are desirable and encouraged. Where biologically feasible, diversity in vegetation species, age and classes is encouraged (Deschutes NF LRMP MA-9, Ochoco NF LRMP MA-F26).

Standards and Guidelines

The following are standards and guidelines from the 1990 Deschutes National Forest and 1989 Ochoco National Forest Land and Resource Management Plans (LRMP) as amended by the 1994 Northwest Forest Plan. The Standards and Guidelines for the Northwest Forest Plan shall take precedence except in cases where the Deschutes and Ochoco National Forest Plans are more restrictive or provides greater benefits to Late-Successional forest-related species (Deschutes NF, 1994 ROD, page 8).

Scenic Views Allocations

The outstanding and remarkable scenery of Central Oregon is well known the world over. The existing Forest Plan direction on recreation management and scenic quality is the basis for this analysis. Further direction regarding scenery management is in Forest Service Manual 2380 (Landscape Management) and *Landscape Aesthetics: A handbook for Scenery Management*, USDA, 1995.

The Forest Service implementing regulations also establish a variety of Scenic Quality Standards for scenic views allocation area (Management Area 9). These include:

- Natural-appearing landscape with high scenic integrity level (Retention);
- Slightly altered landscape with medium scenic integrity level (Partial Retention);
- Altered landscape with low scenic integrity level (Modification).

Primary and secondary access and travel routes, along with trail and waterway corridors, are within the scenic allocation area under the Deschutes and Ochoco National Forests and the Crooked River National Grassland management plan.

Table 3-17 - Scenic Corridors on the Deschutes and Ochoco National Forests and the Crooked River National Grassland

Deschutes National Forest Bend/Fort Rock, Crescent, and Sisters Ranger District	Ochoco National Forest Lookout Mountain and Paulina Ranger District	Crooked River National Grassland
Scenic corridor: Road 4601 (Skyliner Road), Highway 46 (Cascade Lakes National Scenic Byway), Upper Deschutes River Wild and Scenic River, Road 45, Road 40, Road 41, Road 42, Road 43, Road 44, Road	**Scenic corridor:** Road 12, Road 16, Road 17, Road 22, Highway 26, Road 2630, Road 27, Road 33, Road 38, Road 42, Road 58, North Fork Crooked River National Wild and Scenic River.	**Scenic corridor:** Highway 97, Highway 26, Road 64, Lake Billy Chinook,Deschutes Wild and Scenic River, Lower Crooked Wild and Scenic River

Deschutes National Forest **Bend/Fort Rock, Crescent, and Sisters Ranger District**	**Ochoco National Forest** **Lookout Mountain and Paulina Ranger District**	**Crooked River National Grassland**
45, Highway 97, Highway 58, Road 61, Road 18 (China Hat Road), Road 9720 (Lava Cast Forest), Road 21, Road 22, Highway 31, Metolius Wild and Scenic River, Metolius Basin, Highway 20 (Santiam Pass Highway), Highway 242 (Mckenzie National Scenic Byway), Road 11, Road 12, Road 14, Road 15, and Road 16.		

Distance Zone

Two primary distance zones fall within the analysis area as viewed from the scenic corridor; including: Foreground (0-0.5 mile) and Middle ground beyond the Foreground up to 5.0 miles.

Scenery and Recreational Experience

High quality recreation experience, diverse landscape, and remarkable scenery uniquely compliment one another within the Central Oregon landscape. The area has provided exceptional recreation opportunities, setting, and experiential levels to generations of people who have recognized its truly unique ecological quality and diversity of landscape character.

Recreation in Central Oregon is more than just camping, fishing, and hiking. People choose a specific setting and/or an experiential level for each of these activities in order to realize a desired set of experiences they come to expect. For instance, camping in a large undeveloped setting with difficult access and few facilities offers a visitor a sense of solitude, challenge, and self-reliance. In contrast, camping in a setting having easy access and with more facilities offers more comfort, security, and social interaction opportunities.

The end product of recreation management is the experience people have. The key to provide most experience opportunities is the setting and how it is managed. Many desired experiences, by way of such proper and effective recreation management, are translated into “setting indicators” as access, remoteness, naturalness, facilities/site management, social encounters, visitor impacts, and visitor management (USDA Forest Service ROS Users Guide).

Aesthetic Experience

“Scenic attractiveness is the primary indicator of the intrinsic scenic beauty of a landscape and the positive responses it evokes in people. It helps determine landscapes that are important for scenic beauty, based on commonly held perceptions of the beauty of landform, vegetation pattern, composition, surface water characteristics, land use patterns, and cultural features” (*Landscape Aesthetics: A handbook for Scenery Management*, USDA, 1995*)*.

Scenic attractiveness is ordinarily very stable. However, in rare circumstances, scenic attractiveness may change because of natural disasters or human alteration of the landscape. Change may increase the potential for a “typical or common” landscape to become “distinctive”.

Along access travel routes, and waterways within Central Oregon, natural disturbances such as past wildfires, insect and disease infestation, wind damage, and invasive plant infestation are evident. As a result, the Central Oregon landscape is characterized by a mosaic of disturbed conditions by these natural processes.

The scenic quality within the project area is based generally on people's perception, including emotional and/or physical attachment to the landscape from a sensory perspective (such as sight, sound, feel, taste, and touch) and cultural value (such as attitudes and beliefs).

Recreation Niche - Settings

The niche is, in part, determined by public expectations (demand) and by the ecological capabilities of the land (settings). In 2006, the two Forests developed a recreation niche statement. Public participants in this process described and mapped their preferred recreation activities and where they recreate. This "sense of place" map product was translated into a narrative about the relative importance of the Forest for various recreation opportunities, experiences and benefits and used to develop the recreation niche statement. The wide variety of visitor preferences and uses were grouped into spatial categories (settings). On the Deschutes National Forest there are three spatial categories: The Alpine Summit is the crest of the Cascade Range volcanoes that are the scenic backdrop of snowcapped peaks for Central Oregon visible from local communities. Many lakes nestled in alpine forests and meadows, accessed primarily by trails, afford solitude in a predominantly wilderness setting. The Recreation Hubs are the heart of Central Oregon recreation opportunities and gateways to the Alpine Summit and High Desert. It is characterized by volcanic mountains and buttes, caldera lakes, and rushing clear rivers cutting through the high desert terrain of majestic ponderosa pine. The High Desert is a land of dry pine forest, open space and big sky. Major highways are dotted with small rural communities, and ranches with traditional family ties. On the Ochoco National Forest, there are two spatial categories (settings): The Backyard – Located closest to the more populated communities, nearby neighbors and families have easy access to the Forest and Grassland, giving them the opportunity to spend an hour or spend the day. The Back 40 - Adjacent to working ranches and located further from larger population centers, it offers a remote experience and allows for self-discovery & finding your own special place on a variety of roads and trails from highway to hiking.

Existing Condition

The existing condition described in this document includes "positive attributes" and "negative deviations" from the valued landscape character and recreational experience level. Deviations from the valued landscape character and recreation experience are often caused by human or management activities. These may include changes from construction of facilities, unauthorized 'user created routes', dispersed campsites, increases in human interaction that socially affect quiet places or private areas, and naturally caused disturbance events, such as wildfire, insect and disease, invasive plant species, and flooding or erosion.

Recreation and Scenic Condition Summary

The recreation and scenic condition within the analysis area may not meet the expectations and preferences of many visitors or users in its current condition. An overall decline in forest health in addition to wildfire, invasive plant infestation, and other disturbances, including an increase in motorized recreation off designated routes, affects recreation experience and scenic characteristics of the area the most. Still, this highly valued landscape--even if not quite as intact as it once was—continues to be valued and appreciated by the people who recreate and utilize this area for its strong "sense of place" settings.

Positive Attributes

Since their creation as parts of the Cascade Forest Reserve in 1893 and Blue Mountains Forest Reserve in 1906, the Deschutes and Ochoco National Forests have played an important role in Central Oregon's social and economic history. These two national forests and the Crooked River National Grassland were the major supplier of timber, as well as grazing range land, during the decades when mills and cattle formed the core of Central Oregon's economy.

Primitive access roads, often no more than muddy dirt tracks on old wagon trails through pristine forest, had been constructed to most of the important points in and adjacent to these national forests by 1908. As cars

became more common and access roads were improved, recreational use increased proportionally to the relative ease of access and travel into the area.

Today, the diverse landscapes, cultures, experiences, and distinctive places of the Deschutes and Ochoco National Forests, along with that of the Crooked River National Grassland, encompass just over 2.5 million acres of Central Oregon. These public land areas offer a wide variety and multitude of recreational opportunities and experiences. Some of the most popular activities, which draw over eight million visitors to Central Oregon each year and establish this area as the Mecca of America's Great Outdoors, include boating, day use sites, dispersed and developed camping, fishing, white water rafting, guides and outfitters, rental and summer homes, rock hounding, summer and winter trails, wildlife viewing, outdoor photography, winter recreation, destination resorts, scenic drives, and the rapidly growing and highly popular Off Highway Vehicle (OHV) use.

Coupled with awesome natural scenery that offers travelers magnificent views of snow-capped mountains, grassy meadows, lush-green forests, gushing springs, crystal clear lakes, flowing rivers, rushing streams filled with trout, amazing geology, and numerous wildlife species, the area has attracted countless visitors for decades.

Negative Deviations

In Central Oregon, natural and man-made forest disturbance processes are especially visible and accessible to the forest visitor along major travel corridors, including roads, trails, and waterways. This is particularly true for the eastern "High Desert" landscape prevalent on parts of the Ochoco National Forest, most of the Grassland, and East Ft. Rock Ranger District where middle ground and background views can be seen from most designated routes. Access roads, unauthorized 'user created routes', utility corridors, recreation facility development, timber harvest activities, insect and disease infestation, wildfires, and the spread of invasive plants, all contribute to the alteration of natural landscape character and recreational experience. Motorized recreational use of the Forests and Grassland has continued to increase proportionally with area population increases. Many of the unauthorized motorized routes have been created primarily for recreational riding and for access to dispersed camping and other recreational opportunities.

The relative ease of access off designated routes by motorized vehicles, including increased use of OHV's for both recreation and access is slowly altering the natural landscape and affecting the recreational experience level on the Deschutes and Ochoco National Forests, as well as the Crooked River National Grassland. Although there is not an inventory of the amount of unauthorized 'user created' motorized routes, an inventory of key areas completed in 2004 indicates that this type of use is rapidly increasing. These motorized routes are becoming more visible to the casual observer, and in some cases, may not be visually subordinate, particularly along many of Central Oregon's roads, trails, and waterways. This use is most visually evident in foregrounds along routes in popular use areas including riparian areas and buttes. Buttes can often be seen from middleground, or even background where wheel tracks and hill climb areas may become distinct visual elements that alter the form, line and texture of the landscape.

Analysis of Environmental Effects

Alternative 1

<u>Motorized Access off Designated Routes</u>

As described in Table 3-18, approximately 103,063 acres on the Deschutes and 7,043 acres on the Ochoco National Forests are currently open year round or seasonally to motorized access off designated routes. Effects to scenic views are generally within ¼ mile of a major roadway, but can extend as far as 5 miles or more in the high desert areas that are primarily juniper and sagebrush. Although there is no comprehensive inventory of unauthorized user-created routes, foreground and middle-ground views of significant landscape features such as cinder cones or buttes have been altered by motorized access off designated routes,

especially in very popular areas for off highway vehicle use. It is expected that motorized use off designated routes will increase commensurate with population increases (see Recreation Section). As the number of motorized routes increase across the landscape, it will increase the area where this activity is evident as a human alteration, and alter the form, line, color, and texture of the setting and aesthetics of the recreation experience. Over time, these alterations may substantially change the scenic views to the surrounding landscape, especially where the landscape features are highly visible. These "negative deviations" from the valued landscape character and recreation experience may not meet the expectations and preferences of many visitors or users, and may not meet the Scenic Quality Standard in areas where high use is visually evident. Under this alternative, especially in areas that are highly visible to the casual observer, the desired future condition for scenic resources may not meet public expectation, goals, and objectives.

Table 3-18 – Alternative 1 - Motorized Access Off Designated Routes in Scenic Views Management Areas

FOREST	DESCRIPTION	Existing - Closed to Motorized Access	Existing - Closed to Motorized Access Off Designated Routes	Existing - Closed to OHV Access	Existing - Closed to OHV Access Off Designated Routes	Existing - Open to Motorized Access Off Designated Routes	Existing - Open to Motorized Access Off Designated Routes Allowed Seasonally	Grand Total
Deschutes NF	Metolius Scenic View Partial Retention Foreground	6	2,087		5,454			7,548
	Metolius Scenic View Partial Retention Middleground		57		228			285
	Metolius Scenic View Retention Foreground		1,168		738			1,906
	Scenic View Partial Retention Foreground	560	1,328	4,340	22,706	43,124	3,046	75,104
	Scenic View Partial Retention Middleground	160	11,524	11,399	16,186	31,776	2,860	73,905
	Scenic View Retention Foreground	12	2,785	1,816	12,610	15,892	4,663	37,778
	Scenic View Retention Middleground		457	857	90	1,701		3,105
Deschutes Total		**731**	**17,261**	**18,412**	**52,330**	**92,493**	**10,570**	**199,630**
Ochoco NF	Recreation Trail Visual Retention		1,018					1,018
	Summit Trail Partial Visual Retention Corridor	9	113		3,736		1,183	5,041
	Summit Trail Preservation Corridor				127		56	183
	Summit Trail Visual Retention Corridor	677	604		2,670		628	4,580

FOREST	DESCRIPTION	Existing - Closed to Motorized Access	Existing - Closed to Motorized Access Off Designated Routes	Existing - Closed to OHV Access	Existing - Closed to OHV Access Off Designated Routes	Existing - Open to Motorized Access Off Designated Routes	Existing - Open to Motorized Access Off Designated Routes Allowed Seasonally	Grand Total
	Summit Trail Visual Retention Corridors				100			100
	U.S. Highway 26 Visual Corridors				7,097			7,097
	Visual Management Corridors (Partial Retention)	1,021			13,869	0	4,286	19,177
	Visual Management Corridors (Retention)	1	0		4,263	0	890	5,154
Ochoco Total		**1,708**	**1,735**		**31,864**		**7,043**	**42,350**
Grassland	Lake Billy Chinook Viewing Area		483					483
Grassland Total			**483**					**483**
Ochoco & Grassland Total								**42,833**

Motorized Access for Dispersed Camping

As described in Table 3-19, approximately 167,519 acres on the Deschutes National Forest and 38,906 acres on the Ochoco National Forest are currently open year round or seasonally to motorized access for dispersed camping. Effects to scenic views from these motorized routes are generally within ¼ mile of a major roadway, or from the dispersed site itself and include loss of vegetation and visible 'tracks' within the view corridor. Both Forests and the Grassland have GIS layers that have mapped dispersed sites. In some cases these have been updated recently (1-5 years old) while in others the mapped sites are as many as 20 years old. On both Forests it is known that the GIS layers are incomplete and most likely do not include all existing dispersed sites, but that do provide a starting point for discussion on proximity and effects. Although there is no comprehensive inventory of unauthorized user-created routes to these dispersed sites, the foreground has been altered by motorized routes for dispersed camping, especially in very popular areas for camping and off highway vehicle use. Under Alternative 1, visual alterations from these routes or 'tracks' are expected to increase commensurate with population increases and demand for dispersed camping (see Recreation Section for statistics and trends on Dispersed Camping). Increased motorized access routes will increase the area where this activity is visible and evident as a human alteration, and further alter the form, line, color, and texture of the setting and aesthetics of the recreation experience. Over time, these alterations may become a distinctive change to the scenic views of the surrounding landscape, although not substantially. These changes would be most notably in visually sensitive areas. These "negative deviations" from the valued landscape character and aesthetic experience may not meet the expectations and preferences of many visitors or users, and may not meet the Scenic Quality Standard in areas where high use is visually

evident. Under this alternative, especially in areas that are highly visible to the casual observer, the desired future condition for scenic resources may not meet public expectation, goals, and objectives.

Table 3-19 – Alternative 1 - Motorized Access for Dispersed Camping in Scenic Views Management Areas

FOREST	DESCRIPTION	Existing - Closed to Motorized Access	Existing - Closed to Motorized Access For Dispersed Camping	Existing - Open to Motorized Access For Dispersed Camping	Existing - Open to Motorized Access For Dispersed Camping	Existing - Open to Motorized Access For Dispersed Camping Seasonally	Grand Total
Deschutes	Metolius Scenic View Partal Retention Foreground	6	7,542				7,548
	Metolius Scenic View Partial Retention Middlegrnd		285				285
	Metolius Scenic View Retention Foreground		1,906				1,906
	Scenic View Partal Retention Foreground	560	2,829	67,917	67,917	3,798	75,104
	Scenic View Partial Retention Middleground	160	13,202	55,503	55,503	5,041	73,905
	Scenic View Retention Foreground	12	5,063	28,167	28,167	4,535	37,778
	Scenic View Retention Middleground		546	2,558	2,558		3,105
Deschutes Total		**738**	**31,373**	**154,145**	**154,145**	**13,374**	**199,630**
Ochoco	Recreation Trail Visual Retention		1,018				1,018
	Summit Trail Partial Visual Retention Corridor	9	113	4,919	4,919	0	5,041
	Summit Trail Preservation Corridor			183	183		183
	Summit Trail Visual Retention Corridor	677	604	3,298	3,298	0	4,580
	Summit Trail Visual Retention Corridors			100	100		100
	U.S. Highway 26 Visual Corridors			7,097	7,097		7,097
	Visual	1,021		18,155	18,155	0	

FOREST	DESCRIPTION	Existing - Closed to Motorized Access	Existing - Closed to Motorized Access For Dispersed Camping	Existing - Open to Motorized Access For Dispersed Camping	Existing - Open to Motorized Access For Dispersed Camping	Existing - Open to Motorized Access For Dispersed Camping Seasonally	Grand Total
	Management Corridors (Partial Retention)						19,177
	Visual Management Corridors (Retention)	1	0	5,153	5,153		5,154
Ochoco Total		**1,708**	**1,735**	**38,906**	**38,906**		**42,350**
Grassland	Lake Billy Chinook Viewing Area		483				483
Grassland Total			**483**				**483**
Ochoco & Grassland Total							**42,833**

Effects Common to Alternatives 2 and 3

Motorized Access off Designated Routes

143,145 acres on the Deschutes (roughly 72%) , and 22,777 acres on the Ochoco and Crooked River National Grassland (roughly 53%) would be closed to motorized access off designated routes within Scenic Management Areas. Motorized access off designated routes would continue to be prohibited to OHV access off designated routes on 39,362 acres on the Deschutes, and 19,037 acres on the Ochoco. In addition, all motorized access would be prohibited on about 738 acres on the Deschutes, and OHV access would be prohibited on 18,303 acres within scenic management areas on the Deschutes. See Table 3-20 for detailed acreages for each Scenic View designation.

This would have an indirect effect of allowing vegetation recovery in areas where vegetation has been altered by motorized use, and prevent future vegetation modification by motorized access off designated routes. Restricting all motorized access to designated routes would substantially reduce the alteration of form, line, color, and texture across the landscape, and benefit the aesthetics and scenic views to the surrounding landscape, especially where significant landscape features are highly visible, and where high use is visually evident such as cinder cones or buttes. The integrity of the landscape character and recreation experience would be enhanced and improved, and Scenic Quality Standards would be preserved and enhanced as well.

Table 3-20 – Alternative 2 & 3 - Motorized Access Off Designated Routes within Scenic View Corridors

FOREST	DESCRIPTION	Continued Existing - Closed to Motorized Access	Continued Existing - Closed to Motorized Access Off Designated Routes	Continued Existing - Closed to OHV Access	Continued Existing - Closed to OHV Access Off Designated Routes	Proposed - Closed to Motorized Access Off Designated Routes	Grand Total
Deschutes	Metolius Scenic View Partal Retention Foreground	6	2,087		4,412	1,042	7,548
	Metolius Scenic View Partial Retention Middlegrnd		57		228		285
	Metolius Scenic View Retention Foreground		1,168		587	152	1,906
	Scenic View Partal Retention Foreground	560	1,328	4,231	13,172	55,813	75,104
	Scenic View Partial Retention Middleground	160	11,524	11,399	13,889	36,934	73,905
	Scenic View Retention Foreground	12	2,785	1,816	6,993	26,171	37,778
	Scenic View Retention Middleground		457	857	81	1,709	3,105
Deschutes Total		738	19,406	18,303	39,362	121,821	199,630
Ochoco	Recreation Trail Visual Retention		1,017				1,017
	Summit Trail Partial Visual Retention Corridor	0	113		1,991	2,938	5,041
	Summit Trail Preservation Corridor				82	101	183
	Summit Trail Visual Retention Corridor		604		1,660	2,315	4,580
	Summit Trail Visual Retention Corridors				30	71	100
	U.S. Highway 26 Visual Corridors				5,388	1,709	7,097
	Visual Management Corridors (Partial				7,506	11,671	19,177

FOREST	DESCRIPTION	Continued Existing - Closed to Motorized Access	Continued Existing - Closed to Motorized Access Off Designated Routes	Continued Existing - Closed to OHV Access	Continued Existing - Closed to OHV Access Off Designated Routes	Proposed - Closed to Motorized Access Off Designated Routes	Grand Total
	Retention)						
	Visual Management Corridors (Retention)	1	0		2,380	2,773	5,154
Ochoco Total		1	1,734		19,037	21,577	42,350
Grassland	Lake Billy Chinook Viewing Area		483				483
Grassland Total			483				483
Total Ochoco and Grassland							42,833

Motorized Access for Dispersed Camping

Under effects common to Alternatives 2 and 3, motorized access for dispersed camping would be prohibited on about 126,089 acres (roughly 63%) within scenic management areas on the Deschutes and 22,826 acres (roughly 53%) on the Ochoco National Forest. In addition, motorized access would be restricted to "open to motorized access for dispersed camping with Special Provisions" on 6,395 acres (3%) on the Deschutes, and 9,139 acres (21%) on the Ochoco where motorized access for dispersed camping would be allowed only to designated, defined, or existing campsites. Effects to scenic views from these motorized routes are generally within ¼ mile of a major roadway, or from the dispersed site and include loss of vegetation and visible "tracks" within the view corridor. Alterations to the foreground would be reduced where motorized access for dispersed camping is allowed only under the Special Provisions (designated, defined, or existing sites) as new motorized routes to access existing or new dispersed campsites would be reduced. Under both Alternatives, all motorized access for dispersed camping would be prohibited within 30 feet of a stream, or waterbody. Visual Quality Standards would be preserved as they currently exist on the landscape, and would not continue to deteriorate with motorized activity. (See Table 3-21 - Motorized Access for Dispersed Camping within Scenic View Corridors for detailed acreages for each Scenic View designation).

As described in the fisheries and hydrology sections, changing the conditions for motorized access off designated routes and motorized access for dispersed camping would reduce the potential effects to vegetation and visual alterations from these motorized routes within scenic views management areas. It would have the beneficial effect of facilitating vegetation recovery along waterbodies and stream channels, thus contributing to the improvement of the foreground area seen adjacent to major forest roads and from dispersed campsites.

Table 3-21 - Alternative 2 & 3 - Motorized Access for Dispersed Camping within Scenic View Corridors

DESCRIPTION	Continued Existing - Closed to Motorized Access	Continued Existing - Closed to Motorized Access For Dispersed Camping	Continued Existing - Open to Motorized Access For Dispersed Camping	Continued Existing - Open to Motorized Access For Dispersed Camping Seasonally	Proposed - Closed to Motorized Access For Dispersed Camping	Proposed - Open to Motorized Access For Dispersed Camping	Proposed - Open to Motorized Access For Dispersed Camping Seasonally	Proposed - Open to Motorized Access For Dispersed Camping Seasonally With Special Provisions - Non-Riparian	Proposed - Open to Motorized Access For Dispersed Camping Seasonally With Special Provisions - Riparian	Proposed - Open to Motorized Access For Dispersed Camping With Special Provisions - Non-Riparian	Proposed - Open to Motorized Access For Dispersed Camping With Special Provisions - Riparian	Grand Total
Deschutes												
Metolius Scenic View Partal Retention Foreground	6	4,712				1,764					1,065	7,548
Metolius Scenic View Partial Retention Middleground		228				57						285
Metolius Scenic View Retention Foreground		1,464				272				2	169	1,906
Scenic View Partial Retention Foreground	560	1,580	22,987	824	45,257	836	122	449	2	1,234	1,254	75,104
Scenic View Partial Retention Middleground	160	12,772	20,499	1,166	38,171	20	392	7	82	394	244	73,905
Scenic View Retention Foreground	12	4,413	8,961	1,459	20,067	314		120	180	1,616	635	37,778
Scenic View Retention Middleground		449	1,373		1,186	89					8	3,105
Deschutes Total	**731**	**20,677**	**53,820**	**3,448**	**104,681**	**1,531**	**514**	**575**	**264**	**3,246**	**2,310**	**199,630**
Ochoco												
Recreation Trail Visual Retention		1,018										1,018
Summit Trail Partial Visual	0	113	1,798	62	2,000					542	526	5,041

DESCRIPTION	Continued Existing - Closed to Motorized Access	Continued Existing - Closed to Motorized Access For Dispersed Camping	Continued Existing - Open to Motorized Access For Dispersed Camping	Continued Existing - Open to Motorized Access For Dispersed Camping Seasonally	Proposed - Closed to Motorized Access For Dispersed Camping	Proposed - Open to Motorized Access For Dispersed Camping	Proposed - Open to Motorized Access For Dispersed Camping Seasonally	Proposed - Open to Motorized Access For Dispersed Camping Seasonally With Special Provisions - Non-Riparian	Proposed - Open to Motorized Access For Dispersed Camping Seasonally With Special Provisions - Riparian	Proposed - Open to Motorized Access For Dispersed Camping With Special Provisions - Non-Riparian	Proposed - Open to Motorized Access For Dispersed Camping With Special Provisions - Riparian	Grand Total
Retention Corridor												
Summit Trail Preservation Corridor			92	8	82						1	183
Summit Trail Visual Retention Corridor		604	1,180	9	2,337					2	446	4,580
Summit Trail Visual Retention Corridors			16		30						55	100
U.S. Highway 26 Visual Corridors			228		5,388					301	1,180	7,097
Visual Management Corridors (Partial Retention)			5,755	121	8,866				1	761	3,674	19,177
Visual Management Corridors (Retention)	1		1,068	47	2,387					393	1,258	5,154
Ochoco Total	**1**	**1,735**	**10,137**	**247**	**21,090**				**1**	**2,000**	**7,139**	**42,350**
Grassland												
Lake Billy Chinook Viewing Area		424								59		483
Grassland Total		**424**								**59**		**483**
Ochoco & Grassland Total												**42,833**

Alternative 2

Motorized Access for Dispersed Camping

Alternative 2 would include all the actions identified as common to Alternatives 2 and 3. The primary difference between Alternatives 2 and 3 is where motorized access for dispersed camping would be subject to special provisions rather than subject to only the general provisions. Both alternative 2 and 3 would allow for motorized access for dispersed camping in riparian areas only under the special provision conditions. Alternative 2 would designate some areas as open to motorized access for dispersed camping subject to general provisions only in the upland areas. Those routes and areas that would be open to motorized access for dispersed camping under either general or special provisions are shown on the map on CD 1 – Alternative 2 & 3- Motorized Access for Dispersed Camping.

Alternative 2 would allow creating new motorized access routes to new or existing campsites within scenic views management areas on 57,268 acres (roughly 29%) on the Deschutes, and 10,384 acres (roughly 24%) on the Ochoco National Forest and CRNG in those areas designated as "open" to dispersed camping under General Provisions (allowed within a 300' corridor along open designated routes). Affects to visual resources (as described in Alternative 1) would continue and increase commensurate with population increase and demand for dispersed camping. There may be increased demand to create sites within these "open" areas when access to other sites is restricted to Special Provisions. Motorized access for dispersed camping would be restricted to 300' from an open designated route under General Provisions, or to designated, defined, or existing sites under the Special Provisions which would result in reduced impacts to visual resources to a greater degree than Alternative 1, which would continue to allow motorized access for dispersed camping on 167,519 acres (84%) on the Deschutes National Forest, and 38,906 acres (91%) on the Ochoco National Forest and CRNG.

Alternative 3

Alternative 3 would include all of the actions common to Alternatives 2 and 3. Alternative 3 would only allow motorized access for dispersed camping to designated, defined or existing sites along all open designated routes (special provision conditions would apply to all motorized access for dispersed camping adjacent to designated open roads). Within Scenic Management Areas, this would result in a change of approximately 57,268 acres (about 29%) on the Deschutes and 10,384 acres (about 24%) on the Ochoco from "open to motorized access for dispersed camping" under General Provisions in Alternative 2 to "open to motorized access for dispersed camping with Special Provisions, either year round, or seasonally. This would further reduce the potential for loss of vegetation and visible "tracks" within site distance of major roads since new motorized access routes would be reduced. It is possible that the designated, defined, or existing sites may experience higher use levels as population and demand for dispersed camping opportunities increase over time. This may cause a somewhat greater site specific affect to visual resources as more motorized vehicles access these sites more often than in the past. Overall, there would be a beneficial affect to Scenic View Management areas. Based on the current data available on motorized access for dispersed camping in upland areas, this change would be unquantifiable.

Conclusion

The potential effects to Scenic View Management Areas from the impacts of motorized use off designated routes, and motorized access for dispersed camping (as defined under Alternative 1) would be reduced under both Alternative 2 and 3. Overall, there would be a beneficial affect to Scenic View Management areas.

Alternative 3 provides the highest level of protection to Scenic View Management Areas. On the Deschutes National Forest, 731 acres would be closed to all motorized access, and 125,358 acres (about 63%) would be closed to motorized access for dispersed camping. On the Ochoco National Forest and CRNG, 23,249 acres

(about 54%) would be closed to motorized access for dispersed camping. Alternative 3 would designate approximately 65,708 acres (about 33%) on the Deschutes and approximately 12,035 acres (about 28%) on the Ochoco National Forest and CRNG as open to motorized access for dispersed camping with special provisions.

Congressionally Designated Areas

Executive Summary

This section summarizes the analysis of the effects from implementing the actions proposed in this DEIS on Congressionally Designated Areas. Congressionally Designated Areas are areas Congress has identified as having unique characteristics. These areas include wilderness areas, national recreation and research areas, wild and scenic river corridors, areas of special geological interest, and historic trails and sites. Wilderness areas are described in the affected environment, but wilderness acres are not included in the analysis as there would be no affect to wilderness areas from the alternatives being considered in this document. The areas covered in this analysis include wild and scenic river corridors, Newberry National Volcanic Monument, and Oregon Cascades Recreation Area. These areas comprise approximately 152,753 acres on the Deschutes and Ochoco National Forests and Crooked River National Grassland.

Potential effects to the unique values of these Congressionally Designated Areas could result from the impacts of motorized use off designated routes, and motorized access for dispersed camping.

There is no difference in the affects to motorized access off designated routes between Alternatives 2 and 3. Most Congressionally Designated Areas already restrict motorized access to designated routes, less than 1% or approximately 1,141 acres, currently allow motorized access off designated routes. Although the affected area is small (969 acres on the Deschutes National Forest, and 172 acres on the Ochoco National Forest), both action alternatives would restrict all motorized travel to designated roads and/or trails which would have a beneficial effect by further protecting and enhancing the unique values of each area

In Alternatives 2 and 3, the impacts from motorized use off designated routes, and motorized access for dispersed camping would be reduced which would protect and enhance the values for each of these special areas. Alternative 3 offers the highest level of protection as motorized access for dispersed camping would be allowed only under the Special Provisions (designated, defined, or existing sites). Under Alternatives 2 and 3, these areas would be primarily closed to all motorized access or closed to motorized access off designated routes. Under Alternative 2, about 48,647 acres, or 32% of the Congressionally Designated Areas would be open to motorized access for Dispersed camping under the General Provisions, and 2, 976 acres or 2% would be open under the Special Provisions. Under Alternative 3, approximately 51,623 acres or 34% would be open to motorized access for dispersed camping only under the Special Provisions. This would have the most beneficial affect on the Newberry National Volcanic Monument, as 77% of the monument would be open to motorized access for dispersed camping under the General Provisions in Alternative 2.

Affected Environment

Wild and Scenic Rivers

On the Deschutes National Forest, there are six rivers that are part of the Wild and Scenic Rivers System: Upper Deschutes, Little Deschutes, Metolius, Whychus[42] (Squaw Creek), Crescent Creek and Big Marsh

[42] Squaw Creek has been renamed Whychus Creek by the U.S. Geologic Board of Names. Congressional Action must be taken to change the name of a Wild and Scenic River.

Creek, comprising 135.4 river miles. On the Ochoco National Forest, there are three rivers that are part of the Wild and Scenic Rivers System: North Fork Crooked River, Lower Crooked and Middle Deschutes comprising a total of 20.4 river miles. The designated river corridors consist of approximately 50,959 acres out of the total National Forest(s) acreage. The 1968 Wild and Scenic Rivers Act calls for maintaining the free-flowing character of the designated rivers and protecting their "outstandingly remarkable values." Outstandingly remarkable values are values or opportunities in a river corridor that are directly related to the river and which are rare, unique or exemplary from a regional or national perspective. In Table 3X – Deschutes and Ochoco Wild and Scenic Rivers - Outstandingly Remarkable Values are comparisons among specific river corridors. Motorized access within most Wild and Scenic river corridors is restricted to designated routes only. The Upper Deschutes and Metolius Rivers currently restrict motorized access for dispersed camping to designated sites only.

Table 3-22 - Deschutes and Ochoco Wild and Scenic Rivers - Outstandingly Remarkable Values

Wild & Scenic Rivers- Outstandingly Remarkable Values	Cultural	Fish	Geologic	Historic	Hydrology	Ecology	Botany	Tradi-tional	Recrea-tional	Scenic	Wildlife
Deschutes											
Big Marsh			X							X	
Crescent Creek										X	
Upper Deschutes	X	X	X	X			X		X	X	X
Little Deschutes			X							X	
Metolius	X	X	X	X	X	X	X	X	X	X	X
Whychus Creek	X	X	X		X			X		X	
Ochoco											
Lower Crooked									X	X	
Middle Deschutes	X	X	X	X	X	X	X	X	X	X	X
N. Fork Crooked							X			X	

Wilderness Areas

On the Deschutes National Forest there are portions of five wilderness areas along the Cascade mountain crest (Mt. Jefferson, Three Sisters, Mt. Washington, Mt. Thielson, and Diamond Peak). On the Ochoco National Forest there are three wilderness areas that are entirely contained within the forest boundary (Mill Creek, Bridge Creek, and Black Canyon). Table 3X - Land Area in the Wilderness Areas that are Partially or Entirely in the Deschutes National Forest and Ochoco National Forest shows the Forest acres of each of the wilderness areas. Motorized and mechanized use is prohibited by law in all wilderness areas.

Table 3-23 - Land Area in the Wilderness Areas that are Partially or Entirely in the Deschutes and Ochoco National Forests

Wilderness	Total Acres	Deschutes National Forest Acres	Ochoco National Forest Acres
Mt. Jefferson	107,008	32,734	
Three Sisters	286,708	94,370	
Mt. Washington	52,378	14,177	
Mt. Thielson	61,281	7,107	
Diamond Peak	54,185	34,413	
Mill Creek	17,400		17,400
Bridge Creek	5,400		5,400
Black Canyon	13,400		13,400
Total	597,760	182,801	36,200

Oregon Cascades Recreation Area

The Oregon Cascades Recreation Area was established as part of the Oregon Wilderness Act of 1984 (P.L. 98-328). It is an area exhibiting rich diversity in landform and wildlife, and also provides a variety of recreational experiences. The management goal for the Oregon Cascades Recreation Area is to conserve, protect, and manage in a substantially undeveloped condition, the unique values associated with the area, as well as to feature dispersed recreation opportunities. The emphasis for the area is to provide opportunity to enjoy scenic, wildlife, and recreation values in a setting that is not dominated by human activities, but where some motorized use could be permitted along with some recreation related activities.

The Oregon Cascades Recreation Area covers an overall acreage of 157,000 acres, and portions of it are managed by four national forests: The Willamette, Umpqua, Deschutes, and Fremont-Winema National Forests. The portion of the recreation area adjoining the Deschutes National Forest contains a total of 42,700 acres. This area is primarily managed for a Recreation Opportunity Setting of Semi Primitive Motorized. There are no roads inside the recreation area, and geography and vegetation limit motorized access. There are approximately 15 miles of open road adjacent to the recreation area. Ten miles of open

road runs along the northeast boundary adjacent to Crescent Lake and the Diamond Peak Wilderness area, and about 5 miles of open road are located along Windigo Pass. There are approximately 26 miles of trails open to hikers, horses, and mountain bikes.

Newberry National Volcanic Monument

Newberry National Volcanic Monument was created in November of 1990. Managed by the Deschutes National Forest, this monument provides an opportunity for visitors to see and explore a wide variety of unique volcanic features, and observe the volcanic landscape from different vista points. Newberry National Volcanic National Monument includes over 50,000 acres of lakes, lava flows, and geologic features. Two alpine lakes are located at the summit. There are trails open to hikers, horses, and mountain bikes, several campgrounds, and two resorts within the Monument. There are no motorized trails, and off-highway vehicle use is prohibited on and off of designated routes.

Analysis of Environmental Effects

Potential effects to Congressionally Designated Areas include the following:

Motorized use off designated routes, including motorized use for accessing dispersed campsites, could have adverse effects to soils and vegetation by crushing plants, and denuding areas which are then subject to erosion, and conducive to invasive plant infestations which crowd out native plant populations. In some areas, this could impact special botanical values and sensitive and endangered plant species. Scenic values are also impacted when motorized use off designated routes creates wheel tracks or large areas cleared of vegetation in visually sensitive areas such as buttes, meadows, or stream banks. Extensive hill climbing and mud bogging also have adverse affects to scenic values. Dust, noise and exhaust fumes, along with sometimes excessive speed impact the recreation experience for those that prefer solitude, and a more non-motorized setting. Conversely, the recreation experience for motorized users that prefer off-road motorized recreational opportunities would be diminished. Limiting motorized access to designated routes would not provide for more primitive off road recreation opportunities that many users prefer and the landscape settings along designated routes may be less appealing to those who favor motorized off road experiences. These areas also would not provide for off road exploration such as finding your own special places, and technical challenges. Motorized access off designated routes could affect traditional Native American values by impacting tribal gathering areas for roots, berries, etc. Cultural sites could be impacted from motorized access off designated routes which may destroy or expose artifacts. Early American historical sites could be impacted from Motorized access off designated routes if historical buildings or remnants are dismantled to create obstacles or jumps for a more challenging motorized experience, or burned as firewood. Motorized access off designated routes also affects wildlife values through disturbance, and fragmentation of habitat. The following discussion provides specific acreages impacted for each Congressionally Designated Area under each Alternative.

Table 3-24 - Congressionally Designated Areas (CDA) - Effects by Alternative

	Acres	Acres	% of CDA Acres Affected	% of CDA Acres Affected	Total CDA Acres
	Alt 2	Alt 3	Alt 2	Alt 3	
Open to Motorized Access for Dispersed Camping - General Provisions					

	Acres	Acres	% of CDA Acres Affected	% of CDA Acres Affected	Total CDA Acres
Deschutes					
Wild and Scenic River Corridors	2,091	0	5%	0%	43,333
Newberry National Volcanic Monument	45,628	0	77%	0%	58,900
Oregon Cascades Recreation Area	444	0	1%	0%	42,895
Ochoco					
Wild and Scenic River Corridors	484	0	6%	0%	7,625
Total	48,647		32%		152,753
Open to Motorized Access for Dispersed Camping - Special Provisions					
Deschutes					
Wild and Scenic River Corridors	1,418	3,509	3%	8%	43,333
Newberry National Volcanic Monument	4	45,632	0%	77%	58,900
Oregon Cascades Recreation Area	771	1,215	2%	3%	42,895
Ochoco					
Wild and Scenic River Corridors	783	1267	10%	17%	7,625
Total	2,976	51,623	2%	34%	152,753
Closed to Motorized Access for Dispersed Camping					
Deschutes					
Wild and Scenic River Corridors	16,782	same	39%	same	43,333
Newberry National Volcanic Monument	13,267	same	23%	same	58,900
Oregon Cascades Recreation Area	41,680	same	97%	same	42,895

	Acres	Acres	% of CDA Acres Affected	% of CDA Acres Affected	Total CDA Acres
Ochoco					
Wild and Scenic River Corridors	4,949	same	65%	same	7,625
Total	76,678		50%		152,753
Closed to All Motorized Access					
Deschutes					
Wild and Scenic River Corridors	11,198	same	26%	same	43,333
Ochoco					
Wild and Scenic River Corridors	1,409	same	18%	same	7,625
Total	12,607		25%		50,958
Closed to Motorized OHV Access Off Designated Routes					
Deschutes					
Wild and Scenic River Corridors	9,555	same	22%	same	43,333
Oregon Cascades Recreation Area	42,732	41,440	100%	97%	42,895
Ochoco					
Wild and Scenic River Corridors	3,136	same	41%	same	7,625
Total	55,423		59%		93,853
Closed to All OHV Access					
Deschutes					
Newberry National Volcanic Monument	58,900	same	100%	same	58,900

	Acres	Acres	% of CDA Acres Affected	% of CDA Acres Affected	Total CDA Acres
Closed to Motorized Access Off Designated Routes					
Deschutes					
Wild and Scenic River Corridors	22,579		52%	same	43,333
Oregon Cascades Recreation Area	1,454	same	3%	same	42,895
Ochoco					
Wild and Scenic River Corridors	3,080	same	40%	same	7,625
Total	27,113		29%		93,853

Motorized Access Not Affected By the Proposed Action

There are some past decisions about motorized access that would not be affected by the alternatives considered here. Past administrative decisions that have established seasons of use for specific areas (not including proposed Forest Plan amendments), designated motorized routes (roads and trails) or areas, or closed or decommissioned Forest roads would not be changed by any alternatives considered within the scope of this proposed action. The Travel Management Rule allows for some exclusion or exemptions for motorized access, such as over snow or water, as otherwise authorized by permit, and for administrative or emergency access that are not affected by this decision.

The types of motorized access to Congressionally Designated Areas not affected by the decision in this EIS are briefly summarized below. These previous decisions generally have a beneficial affect to these resources as they individually and cumulatively protect and enhance each area's special values.

Wild and Scenic Rivers

Within the Deschutes National Forest's Wild and Scenic River corridors, there are approximately 11,198 acres that will continue to be closed to all motorized access, and 16,094 acres that would continue to be closed to all motorized access off designated routes and would not be affected by this decision. There are 4,246 acres that would continue to be closed to motorized access for dispersed camping that would not be affected by this decision. In addition there are 11,844 acres that would continue to be open to designated sites only.

Within the Ochoco National Forest's Wild and Scenic River Corridors, there are approximately 1,408 acres that would continue to be closed to all motorized access. Also, there are 1,817 acres that would continue to be closed to motorized access off designated routes and to motorized access for dispersed camping that would not be affected by this decision.

Wilderness

On both the Deschutes and Ochoco National Forests, there would be no adverse effects to the existing designated wilderness areas or portions of wilderness areas from any decisions considered here. It is expected that there would be a beneficial effect because there would be overall reduction of motorized

access adjacent to Wilderness areas and the potential for inadvertent access by motor vehicles would be reduced.

Newberry National Volcanic Monument

There are approximately 58,900 acres within the Newberry National Volcanic Monument that currently prohibit off-highway vehicle use on and off of designated routes, and approximately 13,265 acres within the Monument that are currently closed to motorized access for dispersed camping. There would be no adverse effect on the Newberry National Volcanic Monument from decisions considered here. It is expected that there would be a beneficial effect because motorized access adjacent to the Monument would be reduced, and the potential for inadvertent access by motor vehicles off designated routes would be reduced.

Alternative 1

Motorized Access Off Designated Routes

The amount of motorized access currently allowed off of designated routes within the Congressionally Designated Areas is relatively small, a total of approximately 1,141 acres or less than 1% of the total acres on both Forests.

Wild and Scenic Rivers

Within Wild and Scenic River corridors on the Deschutes National Forest there would continue to be 15,236 acres, and on the Ochoco there would continue to be 4,228 acres closed to motorized off highway vehicle (OHV) access off designated routes. This area would continue to only allow OHV's on those trails and/or roads designated for their use. However, 807 acres on the Deschutes, and 172 acres on the Ochoco would continue to be open either year round or seasonally to all motorized access off designated routes. New unauthorized motorized routes could be created and resource impacts would continue to occur with population growth and demand. This could adversely effect or diminish outstandingly remarkable values on rivers that currently do not have restrictions on motorized access off designated routes.

Oregon Cascades Recreation Area

Under Alternative 1, there would continue to be 42,732 acres that are closed to off-highway vehicle access off designated routes, and 162 acres that would be open to motorized access off designated routes. Within the area that is open to motorized access off designated routes, new unauthorized motorized routes could be created and resource impacts would continue to occur with population growth and demand. This could adversely effect or diminish the recreation area values in areas where use is not already restricted.

Motorized Access for Dispersed Camping

Wild and Scenic Rivers

There are 43,333 acres within the Deschutes National Forest Wild and Scenic River Corridors, and 7,625 acres within the Ochoco National Forest Wild and Scenic River Corridors. Motorized access for dispersed camping would continue to be open or open seasonally on an estimated 16,043 acres on the Deschutes, and 4,399 acres on the

Ochoco, or approximately 40% of the total designated Wild and Scenic River Corridors. Dispersed camping along streams and/or rivers is extremely popular. In the Pacific Region, which includes the Deschutes National Forest, the growth rate for primitive camping has been projected to increase by 23% by 2020 (see Recreation section). Within these areas, new motorized routes could be created to access new or existing campsites that may be more desirable, or to meet increased demand when popular campsites are occupied which could diminish outstandingly remarkable values on rivers that currently do not have restrictions on motorized access for dispersed camping. Resource impacts and conflicts between users would continue to occur, and increase with growing population and demand. On the Deschutes, 11,842 acres within the Upper Deschutes, and Metolius River corridors (approximately 23% of the total acres within Wild and Scenic River Corridors) would continue to allow motorized access for dispersed camping to designated sites only. Allowing access to designated sites only would continue to have a beneficial effect on protecting river corridor values. 11,198 acres on the Deschutes, and 1,408 acres on the Ochoco would continue to be closed to all motorized access (approximately 25%), and 4,251 acres on the Deschutes, and 1,818 acres on the Ochoco would continue to be closed specifically to motorized access for dispersed camping (approximately 12%) . These existing conditions would continue to have a beneficial affect by reducing resource impacts from motorized use which would enhance and protect river values.

Newberry National Volcanic Monument

Under Alternative 1, approximately 45,635 acres or 77% of the Newberry National Volcanic Monument would continue be open to motorized access for dispersed camping and other dispersed recreation activities, while about 13,265 acres or 23% would remain closed to motorized access for dispersed camping. New motorized routes could be created to access new or existing campsites within the areas that are open. Resource impacts would continue to occur, and increase with increasing population growth and demand which could have adverse effects on Monument values.

Oregon Cascades Recreation Area

Under Alternative 1, the entire recreation area, approximately 42,895 acres, would continue to be open to motorized access for dispersed camping. There are no roads inside the OCRA on the Deschutes National Forest, and the terrain and vegetation limit access, so the area actually available for motorized access for dispersed camping currently is minimal. Within the acres that will continue to be open and are accessible to motorized access for dispersed camping, it is expected that use will increase over time commensurate with population increases. New motorized routes could be created to access new or existing campsites. Resource impacts would continue to occur, and increase with increasing population growth and demand which could have adverse effects on the Recreation Area values.

Alternatives 2 and 3

Motorized Access Off Designated Routes

There is no difference in the effects to motorized access off designated routes between Alternatives 2 and 3. The following discussion provides specific acreages impacted under Alternatives 2 & 3 for each Congressionally Designated Area.

Wild and Scenic Rivers

On the Deschutes National Forest, there would continue to be 9,555 acres closed to motorized off-highway vehicle access off of designated routes, and 6,485 acres that would be closed to all motorized access (including highway-legal vehicles) off designated routes from the actions common to both Alternatives 2 & 3. On the Ochoco and Grassland there would continue to be 1,409 acres closed to all motorized access, 3,136 acres closed to motorized off-highway vehicle access off of designated routes, and 1,263 acres that would be closed to all motorized access (including highway-legal vehicles) off designated routes. Approximately 800 total acres currently open to motorized access off designated routes would be closed to motorized access off designated routes on the Crescent (13) and Big Marsh Creeks (787) on the Deschutes National Forest. On the Ochoco National Forest, approximately 170 total acres currently open to motorized access off designated routes would be closed to motorized access off designated routes along the North Fork of the Crooked River. Eliminating motorized access off designated routes would help protect and enhance the rivers' outstandingly remarkable values by reducing resource impacts.

Newberry National Volcanic Monument

Under Alternatives 2 and 3, the Newberry National Volcanic Monument would continue to be closed to all motorized OHV access, and motorized access by highway-legal vehicles would be allowed only on designated routes for the purpose of accessing National Forest lands. Restricting or eliminating motorized access off designated routes would help to protect and enhance the Monument's special values by reducing resource impacts.

Oregon Cascades Recreation Area

Alternative 2 and 3 would eliminate motorized access off designated routes within about 162 acres of the Oregon Cascades Recreation Area. This would reduce potential impacts from motorized access off designated routes and protect and enhance the unique values of the recreational area.

Motorized Access for Dispersed Camping

Under both Alternative 2 and 3, it is expected that motorized access to an estimated 80% of existing dispersed camping opportunities on the Ochoco, and 70% on the Deschutes will still be available either through the general provisions, or special provisions. Motorized access to those sites that are further than 300' from a designated open road will no longer be accessible by motorized vehicles unless a route is designated in the future to access those sites. Existing camp sites would still available for public use; however motorized access would be restricted. It is expected that those sites that are located within the general provision areas and the special provision areas will receive a higher level of use, and that demand will increase with increasing population growth. Restricting motorized access would reduce soil compaction and other resource impacts from motorized use which would have a beneficial effect on all Congressionally designated areas by protecting and enhancing their values.

Wild and Scenic Rivers

On the Deschutes National Forest, Wild and Scenic River corridors would be closed to motorized access for dispersed camping on about 16,872 acres or approximately 40% of the total Wild & Scenic River Corridors. In addition, 11,844 acres (or about 27%) would allow motorized access to designated sites only, and 1,417

acres or about 3% would be open either year round or seasonally to motorized access for dispersed camping under the Special Provisions. On the Ochoco National Forest Wild and Scenic River corridors would be closed to motorized access for dispersed camping on about 6,358 acres or approximately 83% of the total Wild & Scenic River Corridors. In addition, 781 acres, or about 10% would be open either year round or seasonally to motorized access for dispersed camping under the Special Provisions. The areas under Special Provisions would provide for motorized access to dispersed camping to Designated, Defined, or Existing campsites only (see definition and illustration in Chapter 2).

Newberry National Volcanic Monument

Actions common to Alternatives 2 & 3 would include two acres in the Monument that would be proposed closed to motorized access for dispersed camping, and 4 acres that would be open to motorized access for dispersed camping under Special Provisions. These acres would protect and enhance Monument values by reducing motorized resource impacts.

Oregon Cascades Recreation Area

Under both action alternatives, 41,682 acres (or approximately 97%) would be closed to motorized access for dispersed camping, and 771 acres would be open to motorized access for dispersed camping with Special Provisions. There are no roads inside the Recreation Area on the Deschutes National Forest, and the terrain and vegetation limit access, so the area actually available for motorized access for dispersed camping currently is minimal. There are approximately 15 miles of open road adjacent to the Recreation Area within the Deschutes National Forest. The 771 acres that remain open under special provisions would continue to provide motorized access for dispersed camping opportunities to most of the area currently used for that purpose. Closing the 41,682 acres to motorized access for dispersed camping, and restricting motorized access to designated, defined, or existing sites on the 771 remaining acres would have a beneficial effect, by protecting and enhancing the Recreation Area's unique values.

ALTERNATIVE 2

Motorized Access for Dispersed Camping

Wild and Scenic Rivers

In addition to the Actions common to Alternatives 2 and 3, on the Deschutes National Forest Alternative 2 would allow motorized access to 2,091 acres that would be open, or open seasonally for dispersed camping under the General Provisions. Within these areas, new motorized routes could be created to access new or existing campsites. 1,418 acres would continue to be open either year round or seasonally to motorized access for dispersed camping –with Special Provisions. On the Ochoco National Forest and Grassland, Alternative 2 would allow motorized access for dispersed camping to about 484 acres year round or seasonally under the General Provisions of the Travel Management Rule, and approximately 783 acres would continue to be open either year round or seasonally to motorized access for dispersed camping with Special Provisions. Motorized access for dispersed camping under general provisions would not be restricted to existing, designated, or defined dispersed sites, and consequently there would be a greater potential for new sites and therefore new motorized access routes to be created within the general provision areas when compared with the special provision areas. Although general conditions would provide improved protection to wild and scenic river values , over time, this would have more potential resource impacts and less protection to Wild and Scenic River values than Alternative 3.

Newberry National Volcanic Monument

In addition to the actions common under Alternatives 2 and 3, there would continue to be 45,628 acres, or approximately 77% of the Monument open to motorized access for dispersed camping under the General Provisions (see Chapter 2 for definitions). Since more acres would be "open" to motorized access for dispersed camping within the 300' corridor allowed under the General Provisions, it is anticipated there would be more new motorized routes created to access new or existing campsites. Although immeasurable, over time, this would have more resource impacts and less protection to Monument values than Alternative 3.

Oregon Cascades Recreation Area

In addition to the actions common under Alternatives 2 and 3, there would be 444 acres, or approximately 1% of the Recreation Area that would be open to motorized access for dispersed camping under the General Provisions. Since 99% of the area would continue to closed, impacts from motorized access for dispersed camping would be concentrated on those acres that are open. Since these acres would be "open" to motorized access for dispersed camping within the 300' corridor allowed under the General Provisions, it is anticipated there would be more new motorized routes created to access new or existing campsites. Although immeasurable, over time, this would have more resource impacts and less protection to the Recreation Area's values, than Alternative 3.

Alternative 3

Motorized Access for Dispersed Camping

In all of the Congressionally Designated areas listed below, in addition to the effects common to Alternatives 2 and 3, Alternative 3 would have the greatest affect on motorized access for dispersed camping as it would restrict motorized use to only existing, defined, or designated campsites on approximately 51,623 acres, or roughly 34% of the total acres. Alternative 2 would allow motorized access for dispersed camping under the General Provisions (within a 300' corridor along designated open roads) on 48,647 acres or 32% of the total acres. Although immeasurable, it is anticipated that Alternative 3 would reduce resource impacts since fewer additional motorized routes to access campsites would be created. This Alternative would put additional demand on those sites that can be accessed under the special provisions, especially in areas heavily used for dispersed camping.

Wild and Scenic Rivers

In addition to the actions common under Alternative 2 & 3, Alternative 3 would allow for motorized access for dispersed camping only to existing, designated, or defined sites in riparian and upland areas (special provision conditions would apply to all motorized access for dispersed camping adjacent to designated open roads). This would change 2,091 acres on the Deschutes, and 484 acres on the Ochoco that were "open to motorized access for dispersed camping" under general provisions in Alternative 2, to "open to motorized access for dispersed camping with Special Provisions, either year round, or seasonally. This alternative would provide the most protection and enhancement to Wild and Scenic River outstandingly remarkable values by reducing the resource impacts from motorized use.

Newberry National Volcanic Monument

In addition to the Actions common to Alternatives 2 & 3, Alternative 3 would allow for motorized access for dispersed camping only to existing, designated, or defined sites in riparian and upland areas (special provision conditions would apply to all motorized access for dispersed camping adjacent to designated open roads). This would change 45,628 acres that were "open to motorized access for dispersed camping" under general provisions in Alternative 2, to "open to motorized access for dispersed camping with Special Provisions, either year round, or seasonally.

Oregon Cascades Recreation Area

In addition to the Actions common to Alternatives 2 & 3, Alternative 3 would allow for motorized access for dispersed camping only to existing, designated, or defined sites in riparian and upland areas (special provision conditions would apply to all motorized access for dispersed camping adjacent to designated open roads). This would change 444 acres that were "open to motorized access for dispersed camping" under general provisions in Alternative 2, to "open to motorized access for dispersed camping with Special Provisions, either year round, or seasonally.

Conclusion

The potential effects to Congressionally Designated Areas from the impacts of motorized use off designated routes, and motorized access for dispersed would be reduced under both Alternatives 2 and 3. Alternative 3 provides the highest level of protection to these areas by allowing motorized access to dispersed camping only to designated, defined, or existing sites.

Heritage Resources

Executive Summary

On the Deschutes and Ochoco National Forests and Crooked River National Grassland heritage resources sites range from less complex scatters of historic debris or prehistoric artifacts to historic structures, trails, and roads. Of these, 10% of the total sites are of a type that is highly vulnerable to off-highway vehicle use. These vulnerable sites include prehistoric and historic structures, historic and prehistoric archaeological sites with features and/or tools present, burials, graves and cemeteries, rock art, culturally modified trees, and culturally significant areas such a traditional cultural properties (including food gathering areas, ceremonial locations, and other traditional cultural properties).

The public recreates in many ways and in many areas of the forests and grassland and often near or within recorded heritage sites. In most cases, such recreation activities and uses are considered to be benign and not to have a negative impact except for deliberate looting of protected archaeological and historic resources. However, operating motorized vehicles off designated routes, as well as to access dispersed camp sites, has the potential to damage, destroy or displace heritage resources.

Alternatives 2 and 3 would have a beneficial effect by reducing impacts to heritage resources by reducing the amount of land open to motorized vehicle traffic. The removal of motorized access off designated routes would generally have a beneficial effect on heritage resources by eliminating the physical disturbances that currently threaten heritage site integrity, whether in highly trafficked areas or in areas at risk of newly created routes. Heritage Resource sites that are currently impacted as a result of motorized access off designated routes would be expected to slowly recover over time due to a reduction in erosion and eventual recovery of soils, along with re-growth of groundcover and understory vegetation.

Affected Environment

On both the Deschutes and Ochoco National Forests and Grassland there are over 7,000 known heritage resource sites, the majority of which reflect prehistoric use patterns prior to the 19th Century (the most common site type being a scatter of stone tool detritus), and the remaining are associated with more recent historic uses related to exploration, early settlement, mining, ranching, timbering, and recreation. Heritage Resource sites can be found in almost any location on public lands; however, distribution patterns of prehistoric, as well as some types of historic sites, can be modeled based upon certain variables (Claeyssens 1991, Houser 1996, Lebow et a. 1991). In general, archaeological sites are found in or near riparian areas and terraces, especially at their confluences, as well as in areas providing shelter, access to food, and other economic resources.

Prehistory

Human occupation of central Oregon in general, and the Deschutes and Ochoco National Forests and Grassland in particular, spans at least the last 10,000 years.

The prehistory of Western North America can be divided into to three broad time periods that are linked to some degree with overall climatic and geological periods. The Paleo-Indian Period roughly corresponds to the end of the Pleistocene and emergence of the Holocene Epoch. Traditionally, Paleo-Indian culture (e.g. Clovis Culture) is thought to represent highly mobile hunting bands reliant on the Pleistocene mega fauna that dominated open steppe and grassland communities on the margins of glaciated terrain and high plateaus of the Pacific Northwest. However, this model is coming under increasing scrutiny as other sites and traditions contemporary or pre-dating Clovis becomes known (cf. Dillehay 1999).

The Archaic Period comprises the bulk of the Holocene up until the beginning of the Historic Period, taken here as 1804 when Lewis and Clark entered the Oregon Territory on their “Voyage of Discovery”. The Archaic is further divided into Early, Middle and Late sub periods. In general, the Archaic represents both a broadening of the subsistence base of hunter gatherers, and in some areas, intensification in the food procurement, processing, and storage technologies that allow for increasing sedentism.

The Historic Period begins in the early 19th Century in central Oregon. This marked the transition from traditional native lifeways and economies to those adversely impacted by the emerging frontier societies. Four Indian tribes inhabited and/or seasonally used areas within the project area during the Historic Period: the Northern Paiute, the Tenino/Tygh (Warm Springs), Klamath/Modoc, and the Mollala. With exception of the Northern Paiute, these three tribes are all tied by language (Sahaptin/Penutian Phylum) and culture to the Plateau peoples of the greater Columbia River Basin and Cascade Range. All of these tribes represent small bands of hunting and gathering peoples who were adapted to the high desert (steppe) and woodland/forest environments of central Oregon by a nomadic or semi-nomadic foraging and collecting economy. The Northern Paiute are associated with the Great Basin culture area and have linguistic (Uto-Aztecan) and cultural ties to other cultures of this physiographic province.

It is highly unlikely that any one of these historic groups or their archaic antecedents occupied permanent villages within the analysis area. Rather the river courses and adjacent lowlands and basins, as well as more distant uplands were exploited seasonally for their food and economic resources. Winter villages or semi-permanent home bases were located outside the analysis area, most likely downstream along the main stem of the Deschutes and its major tributaries, such as the Crooked River, as well as to the east in the playas/basins of Fort Rock, Christmas Valley, and Summer Lake. Both forest and steppe ecosystems were exploited seasonally, as were major rivers, streams, and lakeside habitats.

The faunal, floral, and geologic resources that sustained their subsistence economies included deer, elk, antelope, mountain sheep and a variety of smaller game. Aquatic resources, such as anadromous and

resident fish, as well as fresh water eels and shellfish, also contributed in some areas. Of equal or greater importance were floral food resources, most notable of which were various roots and tubers of the wild parsley family, as well as others such as bitterroot. Seeds of Indian rice grass, chenopodiums, pond lilies (wocus) were also commonly exploited. Other types of floral food resources included a variety of fruits and berries (huckleberry, chokecherry, wild plum, etc.), lichens, and fungi. Tool kits, implements, adornments and clothing were also supplied by faunal and floral resources. In addition, geologic resources provided tool stone for stone (lithic) tools, such as obsidians, basalts and micro-crystalline silicates, as well as pigments, such as iron oxide (red ochre).

Some of these economic pursuits produce relatively scant archaeological signatures (e.g. broad-scale foraging and hunting), with the most typical site type being a scatter of broken stone tools and flaking debris associated with stone tool kit manufacture and maintenance (lithic scatter). Other economic pursuits that relied upon more intensive harvest of resources from a relatively small area (such as freshwater shellfish procurement or seed processing) may produce sites of more volume and complexity. In addition to lithic materials, these site types may also contain ground stone implements, features associated with domestic structures, and middens (such as shell middens).

By mid 19th Century, tribal peoples of Oregon Territory were ultimately placed on reservations following the signing of Treaties with the US Government, effectively making them wards of the state and thus ending their traditional way of life in central Oregon.

History

The historic period for central Oregon began as Euro-American explorers transected the area during the first half of the 19th Century. These expeditions were associated initially with exploration and fur trapping, followed by military/scientific surveys, and ultimately military campaigns against recalcitrant Indian populations. While these expeditions left little physical evidence, they did spur later settlement by providing accounts of the land and resources. One of these significant expeditions is known from John C. Fremont's popular travelogue of his 1843 survey of the Deschutes River with Kit Carson and Indian guide Billy Chinook. The publication of the surveys of the US Army Survey Expeditions for a transcontinental railroad route in 1855, further placed central Oregon on the map.

During the 1840s and 1850s, thousands of emigrants passed through Oregon territory on the way to their future homesteads in the Willamette Valley. Few looked to dry central Oregon for land until the open land in the Willamette Valley became scarce. The initial settlement of central Oregon was also limited by hostilities between Native Americans and settlers. Mining developed more fully during the 1860s in Eastern Oregon, which resulted in improved transportation routes, and the establishment of small communities, which in turn created local needs for natural resources and foodstuffs. Settlement of central and eastern Oregon took root during this era, with small populations centered around water, protection from weather and winds, and adjacent to transportation routes.

The various Homestead Acts, including the Desert Land Act, Enlarged Homestead Act, and the Stock-Raising Homestead Act, were the primary means by which these lands of the public domain were privately acquired between 1860 and 1930. Initially, raising livestock was the primary pursuit, with the uplands of the Cascades, the Paulina Mountains, and the Ochoco Mountains providing abundant summer forage. Soon productive bottomlands of the Deschutes and Crooked River basins were producing substantial yields of vegetable and fruit crops. Water was obtained by springs, hauling, wells, and eventually irrigation systems and reservoirs. By the late 19th and early 20th Centuries, irrigation developments, land speculation and transportation development led to an increase in the settlement of the area.

The Deschutes Basin and the Ochoco Mountains witnessed initial homestead entries in the late 19th to early 20th Century. Ranching of both sheep and cattle dominated the area, with both resident and non-resident herds driven through the area to summer pasturage. The first ranch in the area was established at Hay Creek

in the 1880s. A few years later the city of Prineville was platted and became the county seat for the vast Crook County (which initially included what is now Deschutes and Jefferson Counties). Railways penetrated the region, commencing with a branch line to Shaniko in 1900 to service the expanding sheep market. The increasing conflicts between stock raisers and their grazing rights, especially between sheep and cattlemen, led to the creation of the Blue Mountain Reserves in the late 1890s, known later as the Ochoco National Forest. The Cascade Forest Reserve was also established at this time to conserve timber, grazing, and scenic resources. It became the Deschutes National Forest.

Within the next decade, two railroad barons competed for access to the community of Bend and its promise of billions of board feet of Ponderosa Pine. By 1911, Bend was reached by the winner, James J. Hill, owner of the Oregon Trunk Line (OTL) and the Great Northern, platting the towns of Madras and Redmond along the way. In 1918 the earlier settled community of Prineville formed its own railway to connect to the OTL, thereby providing access to large tracks of pine and markets.

The industrial scale mills located in Bend, Brooks-Scanlon and Shevlin-Hixon, purchased many of the lands surrounding the Bend area. In general the former dominated lower elevation forested lands east of the river basin, while the latter concentrated west of the Deschutes River. Later, industrial scale logging also developed in the Ochocos on both federal and privately held timber tracts.

During the Great Depression capacity was added with local mills in the Prineville area, such as Ochoco Lumber Co. Large volumes of timber were harvested from private lands initially and shifting to Forest Service lands after World War II. Many of the cutover private lands were later acquired by the Forest Service and now comprise parts of the Deschutes and Ochoco National Forests.

The development of National Forest recreation facilities in the 1920s and 30s commenced the emergence of another key central Oregon commodity: recreation experiences and amenities associated with the great outdoors. Within a short while, fishing, hunting, rock hounding, camping, hiking, skiing, and recreational vehicle use all became commonplace for the region.

Development in central Oregon continued during the late mid 20th Century as parts of the Deschutes and Crooked River Basins were considered for reservoir development to increase local storage capacity for downstream irrigation. This irrigation water was directed to the more favorable agricultural lands in Jefferson and Crook counties, particularly near the towns of Culver, Madras, and Prineville.

Indian Tribes, Treaty and Trust Resources

The traditional, treaty and ceded lands of three federally recognized tribes overlap the two national forests and Grassland. These tribes consist of: The Confederated Tribes of the Warm Springs of Oregon (Warm Springs Tribe), The Klamath Tribes and the Burns Paiute Tribe. However, of the three, the Warm Springs Tribe is the only tribe with ceded land treaty rights as per the 1855 Treaty with the Tribes of Middle Oregon. The Klamath Tribes' former reservation is now part of the Fremont-Winema National Forest, and their aboriginal territory includes parts of the Deschutes National Forest as well. The Burns Paiute Tribe, while federally recognized, has neither a formal reservation nor ceded lands on the national forests, however their traditional territory includes portions of both forests and the grassland. It is well known and documented that those members of the Warm Springs Tribe continue to exercise their ceded land treaty rights on the grassland and both national forests, mostly in the harvest and collection of traditional foods, such as roots, lichens and berries. The Ochoco National Forest and Grassland have mapped areas where traditional use is known to occur and they have coordinated with the Warm Springs Tribe on their First Foods initiative to preserve and maintain traditional cultural uses and their habitats.

While they are less well known and documented, anecdotal evidence exists of traditional and ceremonial uses of public lands by members of the Klamath Tribes and Burns Paiute Tribe. However, the locations and details of these practices are unknown at this time. In general, under ceded land treaty rights, the American Indian Religious Freedom Act (AIRFA) and the Sacred Sites Act, the Forest Service cooperates with Tribes

and individual practitioners to assure access to and use of public lands for said purposes. Many of the concerns addressed by Tribes or practitioners of ceremonial and traditional uses are related to having roaded access to sites (which helps to facilitate access by elderly practitioners), desire for solitude, respect and lack of interruptions or interference by the public (including off-highway travel), and continued access to and use of an area.

Environmental Effects

Heritage resource sites can be affected in many ways by highway-legal and non- highway-legal vehicles. Direct effects on these resources occur where OHV use, user-created routes, and informal maintenance of these routes overlap with heritage site boundaries on National Forest system lands. These effects include trampling, rutting, relocation of artifacts, and other forms of disturbance from vehicle tires. Indirect effects on heritage resources can also occur from vehicular travel. These include environmental effects such as road washouts within archaeological sites that often result from user created routes, as well as an increase in human related effects, such as looting and vandalism. In particular, looting and vandalism can result from increased access to areas with sensitive cultural resource sites near or adjacent to road systems and dispersed campsites. With archaeological sites, these effects are also magnified by the increased ground visibility that results from vegetation loss from vehicular trampling.

Often these direct and indirect effects on heritage resources are not immediate, but have cumulative effects of degradation over time. In such cases, continued use of the recreation site may lead to the ultimate demise of heritage sites as artifacts and/or features are gradually trampled, disturbed, removed, or displaced. In order to conduct our analysis of the environmental effects on cultural resource sites on both the Deschutes and Ochoco National Forests, we have selected certain types of sites that we determined were most susceptible to direct, indirect, and cumulative effects of these identified general impacts from motorized access to dispersed camping sites and motorized access off designated routes.

Alternative 1

Under the No Action alternative, sensitive heritage resources are likely to continue to be inadvertently affected in areas currently impacted by motorized vehicle use due to unrestricted motorized access off designated routes and continued use of these areas. In addition, such open access also increases the likelihood of deliberate displacement and destruction of heritage resources by those trafficking in archaeological resources as defined by Archaeological Resources Protection Act (ARPA). Currently there is a major on-going criminal investigation involving ARPA and other violations on public lands in Central Oregon.

Approximately 625,430 acres on the Deschutes National Forest and 431,784 acres on the Ochoco National Forest are currently open to year round or seasonal motorized access off designated routes. Although the access and use of areas open to motorized travel varies widely due to slope, rock and vegetation constraints, heritage resources on the majority of these acres would remain susceptible to additional impacts.

In general, additional impacts to heritage resources are likely to increase as overall recreational use increases across the two forests. Furthermore, heritage resources in and adjacent to heavy-use dispersed camping areas, as well as unauthorized roads and trails, are likely to be the most heavily impacted by this increase in recreational use. Heritage resources are often located in or near the same areas as dispersed campsites, especially near or adjacent to water bodies.

Unauthorized roads and trails have increased in number over the past decade as motorized vehicle users explore and expand their range across public lands. Not only would heritage sites continue to be affected by existing roads and campgrounds, but unrestricted motorized access off designated routes under this alternative would continue to allow the creation and use of more roads and campsites off designated routes across the two forest area. This in turn would affect an ever increasing number of heritage sites.

Since many heritage resources are located where the current road system provides access, this alternative would allow for the continuation of negative impacts directly related to motorized access off designated routes and the indirect effects of recreation use, including dispersed camping. With Alternative 1, there are some 2,000 known sites on the Deschutes National Forest (58%) that would remain vulnerable to impacts from motorized access off designated routes, while on the Ochoco and Grassland there are 1,248 known sites (38%) that would remain vulnerable to impacts from motorized access off designated routes.

Direct effects:

Under this alternative, heritage resources would continue to be impacted by vehicle tires on existing unauthorized roads and trails. These impacts include bisecting of heritage sites, displacement of artifacts, and destruction of archaeological features. In addition to affecting site integrity, soil compaction and alteration of vegetation can lead to erosion, pooling of surface water, freeze-thaw cycles, and other processes with cumulative effects on the integrity of heritage sites. Although the rate at which new trail miles would be created is not known, this trend is expected to continue at a steady rate.

Indirect Effects:

To the extent to which motorized access off designated routes is allowed to continue without regulation, Forest Land and Resource Management Plan (LRMP) standards for site protection, preservation, and enhancement will continue to be compromised. Unrestricted motorized access will have both intentional and unintentional indirect effects on heritage resources resulting from increased visibility due to loss of vegetation, erosion, vandalism, and theft. In addition, if these activities are allowed to continue without Section 106 of the National Historic Preservation Act (NHPA) or National Environmental Policy Act (NEPA) compliance, due consideration of effects to heritage resources would be ignored across both Forests, also preventing adherence to Forest LRMP guidelines.

Motorized access for dispersed camping:

There would be no change to the access of motorized vehicles for the purpose of dispersed camping under Alternative 1. Existing access roads to dispersed sites across both forests are located on both upland and riparian soils and can range from completely denuded, exposed natural surface roads to vegetated, “two track” roads. The access roads located in or near riparian areas are more likely to impact heritage resources since many of those are also located near water bodies. Other impacted areas associated with motorized access for dispersed camping include the parking and turn around areas at the dispersed sites themselves, many of which do not have physical bounds for defining traffic flow. Heritage resources are negatively impacted from continued vehicle traffic, maintenance of dispersed camping sites, and numerous indirect effects already outlined here previously.

Direct effects: The majority of existing dispersed sites have access roads used by motor vehicles that would be maintained in a detrimental condition by continued use, especially in high use areas. The unbounded conditions maintained under this alternative often result in heavily denuded impacts immediately adjacent to stream channels and water bodies where the majority of dispersed campsites are located. Detrimental soil conditions are likely to persist and even expand in dispersed camping areas adjacent to streams and other water bodies under the No Action alternative.

With Alternative 1, there are 2,023 (59%) known sites on the Deschutes National Forest that would remain vulnerable to direct and indirect effects allowed under this alternative, while on the Ochoco and Grassland there are 1,358 (41%) known sites where heritage resources would remain vulnerable to motorized access for dispersed camping.

New areas where heritage resources are located could be impacted under this alternative as users continue to create new access for dispersed camping. Dispersed camping and other vehicle use for access are assumed to increase in the future under this analysis as state and local community populations continue to grow. High use on holiday and hunting weekends often exceeds campground capacities and generally pushes additional campers to disperse camping. Under this alternative, it is assumed this trend would continue to increase both the use of existing sites and the creation of additional dispersed campsites across the two forest area. This in turn would impact heritage resources as existing campsites are expanded and new dispersed campsites are created. These potentially adverse impacts are likely to persist from continued use of newly created dispersed campsites. Although the rate and extent of this impact is not predictable, the general trend rate for this increase is expected to be relatively moderate.

Alternatives 2 and 3

Motorized Access off Designated Routes

Direct Effects: Prohibiting motorized access off designated routes and motorized access for dispersed camping outside of 300' of an open designated route is likely to decrease the number of heritage resources directly or indirectly impacted across the two forest area. The following changes would result in positive effects to the protection and preservation of heritage resources in their environmental contexts and better meet Forest Land and Resource Management Plan Standards and Guidelines:

- The restriction of motorized access off designated routes would limit the formation of additional unauthorized roads and trails and begin to allow existing unauthorized roads and trails that were not designated for long term use under site specific trail projects to recover from impacted conditions.
- The restriction of motorized access for dispersed camping to existing designated or defined sites in high use dispersed camping areas, as well as in the newly designated "special provision riparian areas", would decrease the number of heritage resources impacted by motorized vehicles and dispersed camping in these areas.
- The restriction of motorized access to dispersed sites located within the 100' riparian buffer to at least 30' away from stream channels would also decrease the total number of potentially impacted heritage resources.
- This alternative would maintain or slightly reduce the amount of area (and thus by extension, a high percentage of heritage resources) impacted within 300' of designated routes by restricting motorized vehicle access off of system roads to the sole purpose of ingress and egress to dispersed camping.

Indirect Effects: Heritage Resource sites that are currently impacted as a result of motorized access off designated routes would be expected to slowly recover over time at a rate dependent on the productivity, moisture level, and extent of impact on the site. Most areas that have impacts from motorized travel off designated routes are likely to see steady vegetative recovery after motorized vehicle traffic is removed. Impacted areas located on riparian soils are likely to have a quicker recovery of vegetation than those on upland soils due to higher moisture regimes and general soil productivity. The following recovery rates have been estimated for soils located on sites that would no longer be impacted by motorized access off designated routes.

- 0-5 years – increase of 0-10% vegetative cover
- 5-10 years – increase of 10-25% vegetative cover on these sites
- more than 10 years – up to 30% increase in vegetative cover on these sites

Given time, local soils are capable of recovering from compaction via freeze-thaw, rooting, and ground burrowing mechanisms. Compacted areas from railroad era logging operations have been observed in the

field to have recovered to soil strengths that are only slightly elevated from natural levels some sixty plus years after they were impacted. These areas have been observed to support varying amounts of native herbaceous and shrub vegetation under these conditions. Although active restoration of impacted sites is not proposed under this decision, there would be a slow recovery of detrimental compaction in the soil profile and a return of vegetation on most sites if motorized traffic were discontinued. This recovery of both soils and vegetation would help obscure sensitive heritage resource site locations and allow natural processes of heritage site formation to continue without major human interference.

Motorized Access for Dispersed Camping

Alternatives 2 and 3 would have a direct beneficial effect on heritage resource site locations by restricting motorized access for dispersed camping to within 300' of the centerline of all designated routes. This restriction would prevent new motorized access to heritage sites from being created further than 300' from designated routes. Although this rule would not affect where dispersed camping would be allowed, limiting motorized access for dispersed camping could be reasonably expected to reduce how many sites greater than 300' from an open road are used, and allow existing sites greater than 300' from an open road to recover from the impacts of motorized access, and potentially also to recover from the effects of dispersed camping.

The general provisions allowing motorized access within 300' of a designated open road solely for the purpose of dispersed camping and limited to the same class of vehicle and season of use as the open designated road may have direct and indirect effects on susceptible heritage resources located with that 600' total area on either side of a designated route. However, it is assumed those affects would be negligible and restricted to areas likely already somewhat affected by previous dispersed camping activities, such as where sufficient ingress/egress exists and where openings are present to erect a dispersed camp.

Alternatives 2 and 3 would also provide beneficial affects to heritage resources within the "special provision" riparian areas by pulling back vehicular traffic and parking for dispersed camping at least 30' from stream banks and water bodies. Although the soils located within the vehicle setback buffers are not expected to have full recovery of soil and vegetation conditions due to continued foot and tent camping use, there would be enough improvement of these conditions to allow some improvement of compacted conditions over time and the recovery of vegetative growth on portions of the area, thus providing protection to heritage resources from inadvertent or intentional damage and destruction. This change is estimated to reduce the extent of impact associated with the dispersed sites along one third of the stream edge. Erosion, soil compaction and displacement would be reduced as a result of the 30' setback; by reducing raindrop impacts and filtering overland flows, this, in turn would reduce erosion and artifact displacement from heritage resource sites during storm events.

Alternative 2

Implementation of the proposed action would indirectly affect heritage resources by reducing the amount of land open to motorized vehicle traffic. Approximately 625,430 acres on the Deschutes National Forest and 431,784 acres on the Ochoco National Forest currently open for year round or seasonal motorized access off designated routes would have traffic restricted to designated routes only. The removal of motorized access off designated routes in these areas would generally have a beneficial effect on heritage resources by eliminating the physical disturbances that currently threaten heritage site integrity, whether in highly trafficked areas or in areas at risk of newly created routes.

Motorized access for the purpose of dispersed camping outside of the areas subject to "special provisions" would still have the potential to create new areas of impact within 300' of system roads where vehicles

traveled and parked to camp. Although the expansion of this type of impact is expected to be relatively low, heritage resource sites in areas with sparse vegetation near desirable destinations would be susceptible to vehicular traffic capable of crushing vegetation, compacting sediments, and displacing and/or destroying artifacts and features.

Despite the 30' setbacks, most dispersed sites would likely remain susceptible to some level of erosion and sediment production. Although the overall amount of the soil resources impacted within these sites is assumed to decrease by 35% as a result of the setbacks, potential remains for overland flows and sediment transport in heavily compacted and denuded areas, which may impact some heritage sites. Additional localized impacts to heritage resource sites could be incurred as new parking areas are created to compensate for the setback restrictions. However, these areas would be further from the stream channels and therefore less likely to impact heritage resources, which are often located immediately adjacent to riparian areas.

Alternative 3

Under this Alternative, restriction of motorized access for dispersed camping to existing, designated, or defined sites would minimize the potential for new resource impacts within sensitive areas, many of which are riparian corridors across both forests. This would effectively limit the possibility of newly created access routes or sites within 300' of designated routes or within 30' of streams, lakes, and wetlands. Thus, impacts to heritage resources would not be expected to increase in the "special provision" areas.

By reducing the possibility of newly created motorized vehicle access, parking spots and dispersed sites, Alternative 3 would have a beneficial effect by further reducing potential impacts on heritage resources on 423,419 acres across the two forests (Deschutes: 353,686; Ochoco: 69,733).

Inventoried Roadless Areas

Executive Summary

Inventoried roadless areas are areas that the Forest Service has identified that have potential for consideration as Congressionally-designated wilderness areas, and that may possess important values for landscape health and diversity in an increasingly developed landscape.

There are approximately 137,000 acres on the Deschutes National Forest and 61,000 acres on the Ochoco National Forest and Crooked River National Grassland of Inventoried Roadless Areas (IRAs) totaling 198,000 acres for both Forests and Grassland. Appendix A-3 has maps of the Inventoried Roadless Areas. Approximately 8,000 acres of IRA on the Ochoco National Forest on the Snow Mountain Ranger District are administered by the Malheur National Forest and are not covered under this analysis. Therefore, there are approximately 53,000 acres of IRAs analyzed on the Ochoco National Forest with this environmental impact statement.

In Alternatives 2 and 3, motorized access off designated routes would be prohibited in Inventoried Roadless Areas on both Forests and Grassland, with access limited to currently existing open roads. This would reduce the impacts of motorized access on roadless or potential wilderness values.

Alternative 2 would designate motorized access for dispersed camping on approximately 247 acres in the Deschutes Inventoried Roadless Areas and approximately 1,853 acres in the Ochoco Inventoried Roadless Areas subject to Special Provisions. Motorized access for dispersed camping would be limited to previously existing, designated, or defined sites, and creating new sites for dispersed camping would be prohibited. However, an area that is currently closed on the Crooked River National Grassland, the Deschutes/Steelhead

Canyon IRA (1,296 acres), would be opened for motorized access for dispersed camping. This could have a moderate impact to roadless area characteristics.

Alternative 3 would not designate any motorized access for dispersed camping in any IRA which would have a further beneficial effect of improving the experience of an unroaded, natural landscape by eliminating any motorized travel except on existing open roads within IRAs.

Affected Environment

Overall, there are currently 137,000 acres of Inventoried Roadless Areas on the Deschutes National Forest and approximately 53,000 acres on the Ochoco National Forest and Crooked River National Grassland, not including approximately 8,000 acres of IRAs on the Snow Mountain Ranger District administered by the Malheur National Forest that will not be covered with this analysis.

Inventoried Roadless Areas are often characterized by the following values or features (Federal Register January 12, 2001):

- **High quality or undisturbed soil, water, and air:** These three key resources are the foundation upon which other resource values and outputs depend. Healthy watersheds catch, store, and safely release water over time, protecting downstream communities from flooding; providing clean water for domestic, agricultural, and industrial uses; helping maintain abundant and healthy fish and wildlife populations; and are the basis for many forms of outdoor recreation.
- **Sources of public drinking water:** National Forest System lands contain watersheds that are important sources of public drinking water. Maintaining these areas in a relatively undisturbed condition saves downstream communities millions of dollars in water filtration costs.
- **Diversity of plant and animal communities:** Roadless areas are more likely than roaded areas to support greater ecosystem health, including the diversity of native and desired non-native plant and animal communities due to the absence of disturbances caused by roads and accompanying activities. Inventoried roadless areas also conserve native biodiversity by serving as a bulwark against the spread of non-native invasive species. Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land: roadless areas function as biological strongholds and refuges for many species.
- **Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land:** Roadless areas function as biological strongholds and refuges for many species. Roadless areas support a diversity of aquatic habitats and communities.
- **Primitive, Semi-Primitive Non- Motorized, and Semi-Primitive Motorized classes of dispersed recreation opportunities:** Roadless areas often provide outstanding dispersed recreation opportunities such as hiking, camping, hunting, fishing, nordic skiing and canoeing. While they may have many wilderness-like attributes, unlike Wilderness, mountain bikes and other mechanized uses are often allowed.
- **Reference landscapes:** Knowledge about the effects of management activities over long periods of time and on large landscapes is very limited. Reference landscapes of relatively undisturbed areas serve as a barometer to measure the effects of development on other parts of the landscape.
- **Natural appearing landscapes with high scenic quality:** High quality scenery, especially scenery with natural-appearing landscapes, is a primary reason that people choose to recreate.
- **Traditional cultural properties and sacred sites:** Traditional cultural properties are places, sites, structures, art or objects that played an important role in the cultural history of a group. Sacred sites are places with special religious significance to a group. Traditional cultural properties and sacred sites may be eligible for protection under the National Historic Preservation Act. However, many of

them have not yet been inventoried, especially those that occur in inventoried roadless areas.

- **Other locally identified unique characteristics:** Roadless areas may offer other locally identified unique characteristics and values. Examples include uncommon geological formations, valued for their scientific and scenic qualities, or unique wetland complexes.

In addition to the roadless characteristics listed above, IRAs also are valued for their potential as Congressionally-designated wilderness areas. As such, there are five wilderness values identified in FSH 1909.12, Land Management Planning Handbook, Chapter 70, that are important to consider when proposing activities within IRAs:

- **Natural:** This quality evaluates the area's ecological systems to determine if they are substantially free from the effects of modern civilization and generally appear to have been affected primarily by forces of nature.
- **Undeveloped:** This quality evaluates the degree to which the area is without permanent improvements or human habitation.
- **Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation:** This quality evaluates conditions that affect the capability to provide solitude or primitive, and unconfined recreation.
- **Special Features and Values:** This quality evaluates the areas capability to provide other values with ecological, geologic, scientific, educational, scenic, historical or cultural significance.
- **Manageability:** This quality evaluates the area's capability to be managed as a wilderness under the Wilderness Act considering Section 2(c) which defines a wilderness as " …has at least 5,000 acres of land or is of sufficient size to make practicable its preservation and use in an unimpaired condition…"

IRAs on the Deschutes and Ochoco National Forests currently have some acreage open to motorized access off designated routes as well as acreage open to motorized access for dispersed camping, according to current travel management restrictions and land management allocations. These acreages, along with the corresponding percentages, are shown below in Table 3-33, Acres Open to Motorized Access off Designated Routes and for Dispersed Camping in Inventoried Roadless Areas.

Motorized use off designated routes has the potential to impact the values that these roadless areas may possess and preserve, such as primitive recreation opportunities, or undisturbed soil and water resources. All the alternatives have been evaluated against the criteria for Inventoried Roadless Areas and potential wilderness designation. This is summarized at the end of this section in Table 3-37, Summary of Inventoried Roadless Area Alternative Impacts by Criteria.

Table 3-33 Acres Open to Motorized Access off Designated Routes and for Dispersed Camping in Inventoried Roadless Areas

Inventoried Roadless Area	Total Acres	Acres open to motorized access off designated routes43	Acres open44 to motorized access for dispersed camping	% of IRA open to motorized access off designated routes	% of Area Open to motorized access for dispersed camping
Deschutes National Forest					

- 43 Acreages are based on GIS analysis layers that include designations from previous travel management decisions and temporary public use restrictions because of specific site conditions. Motorized access acres have been rounded.
- 44 May include seasonal use periods and may overlap with acreages identified as open to motorized access off of designated routes.

Inventoried Roadless Area	Total Acres	Acres open to motorized access off designated routes43	Acres open44 to motorized access for dispersed camping	% of IRA open to motorized access off designated routes	% of Area Open to motorized access for dispersed camping
Bearwallows	7,316	7,316	7,316	100%	100%
Bend Watershed	14,827	3,445	10,695	23%	72%
Charlton	7,047	0	6,386	0	90%
Maiden Peak	26,437	1,507	26,437	5.7%	100%
Metolius Breaks	11,141	49	6,100	44%	55%
Mount Jefferson	2,282	0	0	0	0
North Paulina	19,668	1,202	16,192	6%	82%
South Paulina	9,072	124	4,859	1.4%	54%
Three Sisters	7,686	1,603	6,607	21%	86%
Waldo	4,973	0	4,223	0	85%
West-South Bachelor	25,993	3,792	25,110	14.6%	97%
Grand Total	136,442	19,038	113,925	14%	75%
Ochoco National Forest					
Cottonwood Creek	9,930	1,337	1,391	13.5%	14%
Deschutes/ Steelhead Canyon	10,781	0	0	0	0%
Green Mountain	6,612	6,224	6,255	94	95%
Lookout Mountain	14,116	687	706	4.9%	5%
Rock Creek	11,389	4,332	4,417	38%	39%
Grand Total	52,82845	12,580	12,769	24%	31%

Designated System Roads in IRAs

In 1972, the Forest Service initiated a review of National Forest System roadless areas generally larger than 5,000 acres to determine their suitability for inclusion in the National Wilderness Preservation System. A second review was completed in 1979. Since 1979, Congress has designated some of these roadless areas as Wilderness. The remaining Inventoried Roadless Areas were identified for specific management direction under Land and Resource Management Plans (Forest Plans) completed in the 1980s and 1990s. The direction contained within the Forest Plans allowed, under certain circumstances, roads to be constructed. Roads may have been constructed to provide access for timber sales, to provide access to private land adjacent to roadless areas and for other management activities. In some cases, especially on the Grassland, there are county and state roads crossing Inventoried Roadless Areas. Due to past management decisions, a portion of Inventoried Roadless Areas contain existing open and closed roads which are consistent with current direction. No new system roads have been constructed within Inventoried Roadless Areas on either forest since 2000.

- 45 Total acreage for the Ochoco National Forest IRAs does not include approximately 8,000 acres of IRA on the Snow Mountain Ranger District, Ochoco National Forest administered by the Malheur National Forest.

Roads that are maintenance level 1 are closed to motorized access, unless they occur in an area that is open to motorized access off designated routes. If they do occur in such an area, those maintenance level 1 routes are typically not specifically prohibited from motorized use unless they are physically blocked to prevent such use. Maintenance level 2 roads are open to non-highway legal as well as highway-legal vehicles, and maintenance level 3 roads are open to highway-legal vehicles only. Table 3-34 displays the current miles of National Forest system roads in IRAs on the Forests.

Table 3-34 - Miles of National Forest System Roads within Inventoried Roadless Areas

Inventoried Roadless Area	Miles of Maintenance Level 1 Roads in IRA	Miles of Maintenance Level 2 Roads in IRA	Miles of Maintenance Level 3 Roads in IRA	Total Miles in IRA
Deschutes National Forest				
Bearwallows	0	0.42	0	0.42
Bend Watershed	0.97	0	0	0.97
Maiden Peak	0.35	0	0	0.35
Metolius Breaks	0.37	0.52	0	0.89
South Paulina	1.01	0.03	0	1.04
Three Sisters	0.93	1.67	0	2.60
Waldo	0.77	0	0	0.77
West-South Bachelor	0	0.06	0	0.06
Grand Total	**4.41**	**2.27**	**0**	**6.68**
Ochoco National Forest				
Cottonwood Creek	.8	.6	0	1.4
Deschutes/ Steelhead Canyon	9.2	13.3	.3	22.7
Green Mountain	0	.3	0	.3
Lookout Mountain	.3	1.5	0	1.8
Rock Creek	3.2	1.6	0	4.8
Grand Total	**13.4**	**17.4**	**.3**	**31.1**

Analysis of Environmental Effects

The unique qualities of IRAs, as described above, can be affected by motorized use. Furthermore, the degree to which those values may be affected by motorized use can be influenced by the amount of area that is open to motorized access. For all of these resources, however, the amount and frequency of use is one of the primary factors related to the extent and intensity of impacts. In Inventoried Roadless Areas, as in other areas, roads are often created by repeated motorized use off designated routes. The degree to which these user-created routes are developed is not known. However, it is assumed that motorized access would be limited by steep terrain, the amount and density of vegetation that would impede cross country travel and the proximity to existing open roads. Therefore, while it is difficult to project specific effects of motorized access on IRAs, comparison of the alternatives can be accomplished based on these assumptions of relatively low use.

In addition, as recreation trends analyses predict, continued population growth and increased use of motorized vehicles would likely incrementally increase the demand and use of IRAs beyond current conditions. Many forest users seeking solitude are looking in remote backcountry settings; this trend may continue, or even increase as populations age. As more people are able to seek out backcountry areas off designated routes, more user-created routes are likely to occur. This could affect the roadless character of an

area or a portion of the area. However, if motorized access stays dispersed and at relatively low use levels, there is a lower likelihood that user-created routes would occur and impact the values of the IRAs.

Alternative 1

Alternative 1 could have an effect on the roadless and potential wilderness characteristics of the IRAs by continuing to allow motorized access off designated routes, especially in areas that would not impede access, and where current Forest Plan management direction allows motorized access. The majority of IRAs on the Deschutes National Forest are located on the Cascade Crest adjacent to existing wilderness areas or at higher elevations with steeper slopes and dense vegetation and ground slash. These site conditions do not foster significant amounts of motorized access because of the work necessary to pioneer a trail. Therefore, it is expected that motorized access within IRAs on the Deschutes would be limited to areas of easier travel adjacent to existing open roads. Other areas on the Ochoco National Forest are on more level ground with little impeding vegetation and would provide easier access for cross country travel of motorized vehicles.

The expected trend is for increases in motorized use in general on the forests and grassland and a proportional increase in motorized access to dispersed camping off designated routes in the IRAs would be expected. This use could impact unroaded characteristics such as the primitive recreation experience, soil, water, and air quality, with increased potential for erosion, dust, noise, and other environmental impacts. These impacts are more likely to occur within a certain distance of an existing open road and where site conditions allow for cross country travel. It is not likely that an entire IRA would become so roaded or impacted that the IRA would not be eligible to be considered as potential wilderness because of the extent of interior area away from open roads and inability to easily travel without a pioneered road. See Tab;e 3-35 for the expected impacts by IRA criteria for each alternative.

Effects Common to Alternatives 2 and 3

Alternatives 2 and 3 would prohibit motorized access off designated routes. Both action alternatives would reduce the impacts (such as those described above under Alternative 1) on inventoried roadless area characteristics that result from cross country motorized use. These prohibitions would also maintain existing roadless and potential wilderness characteristics such as natural-appearing landscapes, undeveloped and primitive recreation opportunities, as no new designated routes would be created in the roadless landscape.

Alternatives 2 and 3 would prohibit motorized access for dispersed camping beyond 300 feet of the centerline of an open designated route. This would further reduce the impacts on inventoried roadless area characteristics, especially in interior areas farther than 300 feet.

Alternative 2

Alternative 2 would designate motorized access for dispersed camping within 300 feet from a designated route under special provisions only. Therefore, there would be no change from Alternative 1 in the amount of existing, defined or designated sites for dispersed camping with a motorized vehicle. This approach would concentrate motorized access for dispersed camping within a measured area near an existing designated route. No new areas or access routes would be developed as the special provisions allow dispersed camping access to already existing, defined or designated sites only.

However, one change from existing closed areas would be the expected increase in motorized access for dispersed camping in the Deschutes/ Steelhead Canyon IRA on the Crooked River National Grassland. A 1,296-acre increase in motorized access to dispersed camping off designated routes in this IRA could have a moderate impact to characteristics such as the primitive recreation experience or soil, water, air quality, with increased erosion, dust, and noise potential within 300 feet of an open designated route. However, because the area under the current condition is closed to motorized access and under Alternative 2 motorized access for dispersed camping is limited to existing, defined or designated sites, it is not likely that use will increase

over what is currently occurring. All motorized access for dispersed camping would be limited to the special provisions and no new dispersed camping sites would be developed nor would any new access roads be authorized.

In general, Alternative 2 would not impact the ability of the IRA to be considered for a potential wilderness, and would likely result in beneficial impacts over the No Action Alternative because motorized access would be limited to within 300 feet of roads and only to those sites already existing, designated, or defined for dispersed camping. See Table 3-35 for a summary of acreage figures for each IRA.

Table 3-35 Alternative 2 - Acres Open to Motorized Access off Designated Routes and for Dispersed Camping in Inventoried Roadless Areas

Inventoried Roadless Area	*Total Acres*	*Acres open to motorized access off designated routes*[46]	*Acres open*[47] *to motorized access for dispersed camping*	*% of IRA open to motorized access off designated routes*	*% of Area Open to motorized access for dispersed camping*
Deschutes National Forest					
Bearwallows	***7,316***	***0***	***20***	***0%***	***0.27%***
Bend Watershed	***14,827***	***0***	***0***	***0%***	***0%***
Charlton	***7,047***	***0***	***0***	***0%***	***0%***
Maiden Peak	***26,437***	***0***	***0***	***0%***	***0%***
Metolius Breaks	***11,141***	***0***	***16***	***0%***	***0.14%***
Mount Jefferson	***2,282***	***0***	***0***	***0%***	***0%***
North Paulina	***19,668***	***0***	***0***	***0%***	***0%***
South Paulina	***9,072***	***0***	***1***	***0%***	***0.01%***
Three Sisters	***7,686***	***0***	***190***	***0%***	***2.47%***
Waldo	***4,973***	***0***	***0***	***0%***	***0%***
West-South Bachelor	***25,993***	***0***	***20***	***0%***	***0.08%***
Grand Total	*136,442*	*0*	*247*	*0%*	*0.18%*
Ochoco National Forest					
Cottonwood Creek	***9,930***	***0***	***128***	***0%***	***1.29%***
Deschutes/ Steelhead Canyon	***10,781***	***0***	***1,296***	***0%***	***8.32%***
Green Mountain	***6,612***	***0***	***63***	***0%***	***0.95%***
Lookout Mountain	***14,116***	***0***	***81***	***0%***	***0.57%***
Rock Creek	***11,389***	***0***	***285***	***0%***	***2.5%***
Grand Total	*52,828*	*0*	*1,853*	*0%*	*3.5%*

Alternative 3

Alternative 3 would not allow motorized access off of designated routes nor allow motorized access for dispersed camping in any IRA on the Forests or Grassland. Prohibiting motorized access off designated routes would result in fewer impacts on resource values such as soil, water, and air, and would reduce the occurrence of effects such as erosion and dust. This would have a beneficial effect on all roadless and potential wilderness characteristics as existing impacted areas and vegetation would be expected to recover

[46] Acreages are based on gis analysis layers that include designations from previous travel management decisions and temporary public use restrictions because of specific site conditions. Motorized access acres have been rounded.
[47] May include seasonal use periods

naturally. No additional or new areas would be impacted. Motorized use would be limited to existing open roads within the IRAs. See Table 3-36 for a summary of acreage figures for each IRA.

Table 3-36 Alternative 3 - Acres Open to Motorized Access off Designated Routes and for Dispersed Camping in Inventoried Roadless Areas

Inventoried Roadless Area	*Total Acres*	*Acres open to motorized access off designated routes*	*Acres open to motorized access for dispersed camping*	*% of IRA open to motorized access off designated routes*	*% of Area Open to motorized access for dispersed camping*
Deschutes National Forest					
Bearwallows	***7,316***	***0***	***0***	***0%***	***0%***
Bend Watershed	***14,827***	***0***	***0***	***0%***	***0%***
Charlton	***7,047***	***0***	***0***	***0%***	***0%***
Maiden Peak	***26,437***	***0***	***0***	***0%***	***0%***
Metolius Breaks	***11,141***	***0***	***0***	***0%***	***0%***
Mount Jefferson	***2,282***	***0***	***0***	***0%***	***0%***
North Paulina	***19,668***	***0***	***0***	***0%***	***0%***
South Paulina	***9,072***	***0***	***0***	***0%***	***0%***
Three Sisters	***7,686***	***0***	***0***	***0%***	***0%***
Waldo	***4,973***	***0***	***0***	***0%***	***0%***
West-South Bachelor	***25,993***	***0***	***0***	***0%***	***0%***
Grand Total	*136,442*	*0*	*0*	*0%*	*0%*
Ochoco National Forest					
Cottonwood Creek	***9,930***	***0***	***0***	***0%***	***0%***
Deschutes/ Steelhead Canyon	***10,781***	***0***	***0***	***0%***	***0%***
Green Mountain	***6,612***	***0***	***0***	***0%***	***0%***
Lookout Mountain	***14,116***	***0***	***0***	***0%***	***0%***
Rock Creek	***11,389***	***0***	***0***	***0%***	***0%***
Grand Total	*52,828*	*0*	*0*	*0%*	*0%*

General Impacts

The effects of the Alternatives on Inventoried Roadless Area criteria have been documented in Table 3-37 - Summary of Inventoried Roadless Area Alternative Impacts by Criteria. In general, impacts of motorized use within IRAs would be greatest in Alternative 1 because existing management direction would continue to allow motorized access and cross country travel in some IRAs for a total of 31,618 acres on both Forests and Grassland. Motorized access on existing open roads would continue under all Alternatives and there is no change between alternatives. Alternative 2 and 3 would eliminate motorized access off of designated routes in all IRAs. Alternative 2 would maintain a total of 2,100 acres of motorized access for dispersed camping in five IRAs on the Deschutes National Forest and on all IRAs on the Ochoco National Forest. This access is subject to special provisions and therefore, dispersed camping would be limited to those sites already in existence and defined or designated. No new routes or sites would be designated under Alternative 2. Alternative 3 would not designate any motorized access for dispersed camping in any IRA on either national forest. Motorized access under Alternative 3 would be limited to existing open designated routes. More specific impacts by IRA criteria have been described in Table 3-37

Table 3-37. Summary of Inventoried Roadless Area Alternative Impacts by Criteria

IRA Criteria	*Alternative 1*	*Alternative 2*	*Alternative 3*
Inventoried Roadless Area Criteria			
High quality or undisturbed soil, water, and air	***High quality or undisturbed soil, water and air would be continued especially in IRAs without roads and away from roads. In IRAs with roads, pioneering of roads would continue to occur for dispersed camping and new areas could be impacted. It is unlikely that impacted areas would affect soil, water or air quality because of the limited use currently occurring.***	***Since no motorized access off designated routes would be allowed, impacts would be limited to within 300 feet of designated routes already existing within IRAs.*** ***In the Deschutes / Steelhead IRA on the Crooked River National Grassland, an area currently closed, would be open to motorized access for dispersed camping within 300 feet of a designated route and limited to existing defined or designated sites.***	***Areas currently impacted would be expected to recover to a more natural state. Those areas not impacted, would continue to provide high quality undisturbed soil, water and air resources under current conditions. It should be noted however, that due to high fuel loadings, many of the IRAs are at risk for high intensity, stand replacement fires that could impact soil, water and air. Because Alternative 3 limits motorized access to existing roads only, the risk of human caused starts is lowered because of the reduced motorized access. Access by non-motorized methods has not been restricted and human caused fire starts could still occur.***
Sources of public drinking water	***The Bend Watershed provides public drinking water for the city of Bend. It is within the Bend Watershed IRA. Sources of public drinking water would continue to be protected under current management direction.***	***The Bend Watershed provides public drinking water for the city of Bend. It is within the Bend Watershed IRA. Sources of Public drinking water would continue to be protected under current management direction.***	***The Bend Watershed provides public drinking water for the city of Bend. It is within the Bend Watershed IRA. Sources of Public drinking water would continue to be protected under current management direction.***
Diversity of plant and animal communities	***Because of the difficulty of motorized travel in many of the IRAs, the diversity of plant and animal communities is expected to remain the same. While some areas may experience increases in motorized use, impact is not expected away from existing roads.***	***Alternative 2 would restrict motorized access off designated routes, thereby reducing the amount of ground potentially disturbed. Motorized access would be limited to designated routes already open under current management direction. Motorized access for dispersed camping would be limited to existing, defined, or designated sites and would not impact any additional acres.***	***Alternative 3 would limit motorized access to existing roads within IRAs. There would be no motorized access for dispersed camping, so those areas currently being used would eventually recover naturally, and fallen trees would lead to areas becoming less accessible, thus impacted, by motorized activities.***

IRA Criteria	Alternative 1	Alternative 2	Alternative 3
Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land	***Habitat for threatened, endangered, proposed, candidate, and sensitive species would still be provided in IRAs, especially in those IRAs with no existing roads and for those with roads, it is likely impacts would be limited to within a certain distance from the road based on terrain and vegetation conditions. Large areas of undisturbed land would still be available for those species needing such habitat.***	***Alternative 2 would limit motorized activities to within 300 feet of roads and to areas where dispersed campsites have already been developed. Habitat for threatened, endangered, proposed, candidate, and sensitive species would still be provided in IRAs, especially in those IRAs with no existing roads, and for those with roads it is likely impacts would be limited to within a certain distance from the road based on terrain and vegetation conditions. Large areas of undisturbed land would still be available for those species needing such habitat.***	***Alternative 3 would not allow any motorized access off designated routes, therefore habitat for threatened, endangered, proposed, candidate, and sensitive species would still be provided in IRAs, and areas where impacts have occurred would eventually recover. Large areas of undisturbed land would still be available for those species needing such habitat.***
Primitive, Semi-Primitive Non-Motorized, and Semi-Primitive Motorized classes of dispersed recreation	***This alternative would continue to allow incidental cross country travel and dispersed camping utilizing motorized vehicles, especially near existing open roads. It is unlikely that motorized access would occur in the interior of the larger IRAs because of natural terrain barriers and dense vegetation. It is not likely that this use would be large and cause degradation of dispersed recreational experience. Semi-primitive motorized dispersed recreation would not be affected by this alternative.***	***This alternative would provide primitive and semi-primitive non-motorized dispersed recreation opportunities beyond 300' from system roads. This alternative would improve conditions over the no action alternative by prohibiting motorized access off designated routes. Semi-primitive motorized dispersed camping would be limited to existing open roads and access to existing, designated, or defined campsites. Therefore there would be a reduction in the areas available for motorized recreation access.***	***This alternative would provide primitive and semi-primitive non-motorized dispersed recreation in all IRAs. Motorized use would be limited to existing open roads. There would be no motorized access to dispersed campsites, even existing campsites, with this alternative. Recreationists would be limited to parking their vehicle on the roadside and would not be able to enter the IRA except on an open road. Therefore there would be a reduction in the amount of acres available for motorized access for dispersed camping over Alternatives 1 and 2. No new motorized routes would be designated.***
Reference landscapes	***Reference landscapes within IRAs would still be provided, especially where roads are not located within IRAs.***	***Reference landscapes within IRAs would still be provided, especially where roads are not located within IRAs.***	***Reference landscapes within IRAs would still be provided, especially where roads are not located within IRAs.***
Natural appearing landscapes with high scenic quality	***There would be little change to the current natural appearing landscape within the IRAs with the implementation of this alternative. In areas with existing roads, the trend of increasing use and continued motorized access could increase the evidence of human use. However, this would be limited to pioneered roads and some ground disturbance near existing roads and where natural terrain conditions and vegetation allow cross country travel. It is unlikely that entire IRAs would be negatively affected.***	***There would be little change to the current natural appearing landscape within the IRAs with the implementation of this alternative. Access would be limited to existing open roads and to access dispersed campsites within 300 feet of roads. No additional impacts would occur as no new dispersed camping access would be permitted under this alternative. Natural appearing landscapes would be available, especially beyond 300 feet from open roads.***	***There would be little change to the current natural appearing landscape within the IRAs with the implementation of this alternative. Over time, existing access routes would no longer be used and revegetation would occur, with more natural appearing landscapes in the future. The only motorized access would be on existing designated routes.***

IRA Criteria	Alternative 1	Alternative 2	Alternative 3
Traditional cultural properties and sacred sites	***Traditional cultural properties and sacred sites would continue to be vulnerable to motorized access where current management direction allows motorized access off designated routes and travel to campsites where the sites are near currently open roads. It is unlikely that motorized access would occur in the interior of IRAs that are not currently roaded.***	***Traditional cultural properties and sacred sites would be protected under this alternative because no new motorized dispersed camp sites would be allowed. Existing dispersed campsites would be closed if cultural properties were discovered that could be impacted by motorized and dispersed camping activities.***	***Traditional cultural properties and sacred sites would be protected under this alternative because no motorized access would be allowed except on currently designated routes. Motorized access to existing dispersed campsites would be eliminated and cultural properties and sites would be protected from motorized use.***
Other locally identified unique characteristics	***Locally identified unique characteristics would not be affected by this alternative unless the characteristic only occurred near open roads. Cross country travel could still occur but would likely occur in areas where terrain and vegetation conditions permitted motorized travel.***	***Locally identified unique characteristics would not be affected by this alternative because the amount of designated motorized access would be limited to within 300 feet of designated routes and existing, designated or defined sites. Motorized access off designated routes would not be permitted so interior IRAs would remain as they current exist or impacts from past motorized use would improve with natural revegetation.***	***Locally identified unique characteristics would not be affected by this alternative because the amount of designated motorized access would be limited to designated routes. Motorized access for dispersed camping and motorized access off designated routes would not be permitted so the interior of IRAs would remain as they current exist. Impacts from past motorized use would be expected to naturally recover.***
Potential Wilderness Criteria			
Natural quality	***Overall, natural qualities would be maintained with Alternative 1 because while cross country motorized travel is allowed it is not likely to occur at high levels throughout the entire IRA. Use is expected in areas near designated routes adjacent to IRAs, but impacts are not expected to prevent the area from being considered as a potential wilderness area.***	***Natural qualities would be maintained by this alternative as cross country motorized travel would be prohibited. The alternative would allow motorized access for dispersed camping on already existing, defined and designated camp sites. This would limit impacts to within 300' of currently open roads and no new areas would be developed. Interior IRA areas would maintain their natural qualities and would not incur motorized impacts.***	***Natural qualities would be maintained by this alternative as motorized access off designated routes and motorized access for dispersed camping would be prohibited. Interior IRA areas would maintain their natural qualities and would not incur motorized impacts. Areas adjacent to open roads impacted by previous motorized access would naturally revegetate and impacts would diminish.***
Undeveloped quality	***Under this alternative, it is expected that motorized access would continue to occur beyond existing roads and that people would pioneer roads into areas for camping, hunting, recreation and for other interests. Access would be limited by natural terrain features and vegetation density and likely would not impact areas away from existing roads.***	***Undeveloped qualities would be slightly impacted by this alternative but would be limited to motorized access for dispersed camping in sites that are already existing or defined. Therefore, no additional impacts would be expected than are already currently occurring.***	***Undeveloped qualities would be maintained by Alternative 3 because motorized access would be limited to existing roads within IRAs. Motorized access off designated routes, and motorized access for dispersed camping would be prohibited.***

IRA Criteria	Alternative 1	Alternative 2	Alternative 3
Outstanding opportunities for solitude or primitive and unconfined recreation	***Opportunities for solitude or primitive and unconfined recreation would continue with this alternative, especially away from existing roads and in those IRAs with no roads. Motorized access would continue to occur but would be limited by natural terrain and vegetation density.***	***Opportunities for solitude or primitive and unconfined recreation would be improved over the existing condition with this alternative as motorized access would be limited to within 300' of designated routes, motorized access for dispersed camping limited to existing, designated, or defined sites. Impacts to vegetation beyond 300' would be expected to recover naturally.***	***Opportunities for solitude or primitive and unconfined recreation would be maintained with this alternative as motorized access would be limited to existing roads. Motorized access off designated routes, and motorized access for dispersed camping would be prohibited.***
Special features and values	***Special features and values would be maintained, especially in areas that limit motorized access because of natural terrain barriers and dense vegetation. In areas where a more open and level ground occurs, motorized vehicle use may be more apparent, especially in the future, as expected trends in motorized recreation use increase. However, it is still unlikely that expected increases would result in degradation of special features of IRAs as the majority of IRAs are not presently roaded and do not afford easy access.***	***Special features and values would be maintained, especially 300' beyond designated routes where existing, defined or designated dispersed camp sites already occur. Within 300' of existing open roads and where campsites already occur, evidence of human use maybe apparent in the form of vehicle tracks, dust, soil disturbance and loss of vegetative cover.***	***Special features and values would be maintained as they currently exist with this alternative because no motorized access would be allowed except on designated routes.***
Manageability	***Manageability would not be affected. There would be no new roads or access developed under this alternative. Cross country travel is allowed in some IRAs and would be expected to continue and increase in some areas. Some motorized access for dispersed camping may be developed as populations increase in the local area and more people are interested in accessing areas by motor vehicles. However, access would be limited by natural terrain and vegetation density obstacles.***	***Manageability would not be affected.***	***Manageability would not be affected.***

Soils

Executive Summary

This section summarizes the analysis of the effects on soils within the analysis area that could be affected by the proposed action.

Approximately 625,430 acres on the Deschutes National Forest, and 431,784 acres on the Ochoco National Forest and Crooked River National Grassland are currently open to motorized access off designated routes. In general, the implementation of the action alternatives of this EIS would have a positive effect on the soil resource by reducing the amount of area on which motorized vehicle traffic would be allowed.

Alternatives 2 and 3 would have a positive effect by restricting motorized access for dispersed camping to within 300' of centerline of all designated routes, allowing natural recovery of soils and vegetation in currently existing sites greater than 300' from an open road. There would also be a beneficial effect associated with pulling back vehicular traffic and parking for dispersed camping at least 30' from stream banks. However, additional site specific impacts could have an adverse effect as new parking areas are created to compensate for the 30' setback restriction.

Alternative 2 could have an adverse effect on currently un-impacted areas of the soil resource. Upland areas that lack vegetation capable of inhibiting travel would be susceptible to the establishment of new campsites, parking areas, and new ingress/egress routes within 300' of designated routes. Alternative 3 would beneficially reduce potential impacts to the soil resource from motorized access for dispersed camping as a direct result of implementing special provision restrictions on additional upland areas managed with general provision restrictions under Alternative 2. Alternative 3 protects substantially more acres than Alternative 2 from direct impacts to the soil resource as a result of motorized access for dispersed camping. This equates to the restriction of motorized access for dispersed camping on nearly eight times as many acres on the Deschutes National Forest (404,730 acres versus 51,044 acres) and over twice as many acres on the Ochoco National Forest (124,327 acres versus 54,594 acres).

Affected Environment

Geology

The Deschutes National Forest, Ochoco National Forest and Crooked River National Grassland are primarily underlain by volcanic rocks of a variety of ages. The older volcanic terrain (40 Ma to 17 Ma), underlying the Ochoco National Forest, is comprised of basalts and andesites weathering to clays. Water infiltration does not readily occur and groundwater flow is moderate to low. Large rotational landslides have developed across the Ochoco Mountains during the past 10,000 years and pockets of these landslides reactivate at times when the groundwater flow is modified. Approximately 62 acres on the Ochoco National Forest have active landslides and 87,199 acres contain dormant landslide terrain. Approximately 1,371 acres on the Grassland and 357 acres on the Deschutes National Forest are located on dormant landslide terrain (see Geology section). The younger volcanic units (less than 17 Ma) underlying the Grassland and Deschutes National Forest are comprised of basalts and andesites that exhibit more porous characteristics, allowing more groundwater flow. Landslide prone areas on the Deschutes are very minimal, generally limited to steep glaciated valleys of the Little Deschutes River and tributaries of the Metolius River.

Soils

Volcanic ash and pumice deposits from Mount Mazama, Newberry volcano and others have generally deposited moderately deep layers of pumiceous ash across the Deschutes National Forest. The Mazama and Newberry events also deposited deep layers of coarser pumice on the Crescent Ranger District and the Bend/Ft. Rock District, respectively. A variable mantle of sandsize ashfall from Mount Mazama caps older residual soils on the Ochoco National Forest and Grassland. In general, soils are moderately deep to shallow across the Ochoco and Grassland, and deep to moderately deep across the Deschutes. Older soils similar to those found on the Ochoco and Grassland are present on the Deschutes National Forest on Pine Mountain (Bend/Ft. Rock District) and Green Ridge (Sisters Ranger District), respectively.

Soil characteristics within the Deschutes and Ochoco National Forests and Grassland vary primarily according to the type and depth of the parent material on site. Soils in the planning area are primarily volcanic in origin, generally having developed from wind deposited ash and pumice from Mount Mazama and/or other vent sources. Older soils on the Ochoco National Forest and parts of the Deschutes National Forest have weathered in place from volcanic basalts, andesites or tuffs, and may or may not be covered by ashfall from a vent source.

Soil characteristics also differ due to variations in topography, microclimate and moisture regimes that influence the weathering development of the soil and the vegetation supported on site. Plant communities supported within the planning area include scablands, grasslands and coniferous forests, each of which provide varying amounts of natural, vegetated cover. The amount and type of cover influences the soils ability to resist the natural erosive forces of wind and water as a result of rainfall impacts or overland flow. Change to the amount and type of vegetated cover is one of the primary characteristic of the soil resource affected by management or recreational activities regulated in the travel access management proposal.

Erosion Hazards

Soils across both forests are variably susceptible to wind and water erosion, a risk that is calculated as a basic erosion rate for each soil type and expressed on a relative basis as an erosion hazard when slope class is accounted for. The basic erosion rate is the inherent susceptibility of the soil to resist erosive forces, which is inversely related to surface texture and is calculated based on 100% bare mineral soil conditions. Since the basic erosion rate is primarily influenced by the particle size of the surface mineral soil, finer textured soils on the Ochoco National Forest and Grassland generally have higher values than those on the Deschutes.

Erosion hazard expresses a more accurate rate of erosion given existing amounts of surface cover, slope gradient and intensity of a specific rainfall or wind event. Although the basic erosion rate for soils across the planning area is generally moderate or low, the erosion hazard includes classes of high and very high when these elements are factored in. Existing vegetative cover is generally sufficient to reduce raindrop impacts and minimize overland flow accumulations and energies, except for areas burned within the last year. Slopes range from slightly steep to steep across the Ochoco National Forest and landslide prone terrain is present. Slopes across the Grassland and Deschutes National Forest range from slightly steep to moderately steep, with some steep slopes present on the Deschutes along glaciated valley side slopes. Rainfall intensity is generally highest when associated with thunderstorm events, although the duration of these events is generally short-lived and infiltration rates of most soils with sufficient vegetative cover are capable of absorbing the majority of rainfall.

The likelihood of intense rainfall for extended durations tends to be greatest on the Ochoco National Forest and Grassland, although the Cascade Crest and all portions of the Deschutes can receive this type of event. Although soils are generally moderately well to somewhat excessively drained across the planning area, and are less likely to be saturated prior to a thunderstorm event, intense rainfall events do occasionally exceed the infiltration rates of the soil. Rainfall that does not infiltrate into the soil generally becomes surface runoff in the form of localized sheet flow that can produce rills and gullies when storm durations are extended or compacted surfaces such as roads or trails act to concentrate them. The loss of surface cover due to mechanical or fire disturbances also directly increases the erosion rate of the soil resource.

Surface rock fragments, organic matter content, structure and infiltration rate of the soil also contribute to the calculation of erosion hazard for a particular soil type. Surface rock fragments are generally highest across scablands on the Grassland and Ochoco National Forest, and glaciated terrain on the Deschutes National Forest. Organic matter content is relatively low throughout all areas and structure varies according to the

age and type of parent material. Infiltration rates are generally moderately rapid for soils on the Ochoco National Forest and moderately rapid to rapid on the Deschutes National Forest, although there are clay scabland areas on the Ochoco and Grassland with lower infiltration rates readily exceeded by thunderstorm events. Erosion hazards have been calculated for soils on the Ochoco National Forest and Grassland, and estimated for soils on the Deschutes National Forest.

Sediment Production

As a result of the inherent physical and climatological characteristics of the planning area, sediment production from soils is generally low to moderate. Exceptions include finer textured soils on scablands or areas of high disturbance (compacted or de-vegetated) exposed to high intensity rainfalls that exceed the infiltration rates of the soil. Although sediment yields have not been directly measured in local streams and watersheds, they are known to be accelerated in many upland areas as a result of surface-disturbing land uses such as grazing, mining, timber harvesting, and off-road vehicle use. Poorly located and/or un-maintained roads and trails can also contribute sediment above and beyond normal amounts generated by a watershed.

Change to the infiltration rates of the mineral soil as a result of mechanical disturbance is also one of the primary characteristic of the soil resource affected by management or recreational activities regulated in the travel access management proposal. Land disturbances on unstable, steep slopes can alter the surface and subsurface drainage of water across landscapes and increase the potential to initiate landslides. OHV trails can intercept and concentrate runoff that tends to saturate localized areas. Water concentrated on and above OHV trails that traverse mountain slopes can increase the weight of hillslopes and raises the risk of landslides on susceptible areas of the Ochoco National Forest.

Management Direction

The Deschutes Land and Resource Management Plan (LRMP) includes Forest-wide standards and guidelines that direct land management activities to promote the maintenance or enhancement of soil productivity. Forest Standards and Guidelines applicable to this project include:

> 1) Leaving a minimum of 80 percent of an activity area in a condition of acceptable productivity potential following the implementation of proposed activities (Forest Plan Standard and Guidelines SL-1 and SL-3; p. 4-70);
>
> 2) Regulating the use of mechanical equipment in sensitive soil areas. Operations will be restricted to existing trails and roads whenever feasible (SL-5).

The Ochoco Land and Resource Management Plan includes Forest-wide standards and guidelines to minimize compaction, displacement, erosion and mass wasting of the soil resource by proposed activities. These are summarized on p 4-195, 196, 197 and 198 of the Ochoco LRMP.

Deschutes and Ochoco LRMP Standard and Guidelines for the soil resource relevant to this project (Deschutes SL-1, SL-3 and SL-5; Ochoco p 4-195, 196, 197) would be met under either action alternative.

Analysis of Environmental Effects

The following section summarizes the potential effects that motorized vehicles can incur on the soil and vegetative components that indirectly affect the erosion and sediment potential of impacted areas.

Motorized access off of designated routes and motorized access for dispersed camping can compact and displace the soil, reducing the productivity of the resource and altering the vegetative cover and the erosion/sediment potential of the affected areas.

Soils - The range of soil textures and soil types located in riparian and upland landscape positions across the Deschutes and Ochoco National Forests are all susceptible to detrimental increases in soil strength after multiple vehicle trips. Some finer textured soils in riparian areas can become rutted and express detrimental puddling when vehicular traffic occurs during wet conditions. Increased soil strength directly reduces the productivity and decreases the infiltration rates of the affected areas on a localized basis.
Vegetation – The health and vigor of riparian and upland vegetation present across the two forests are susceptible to physical crushing and detrimental compaction. Existing parking or vehicular access roads associated with dispersed camping are generally detrimentally compacted and have reduced vegetative cover. Recovery of vegetation on these sites is generally slow due to the compacted ground and continual traffic during the growing season.

Sediment – Decreases in infiltration rates and the loss of effective cover capable of reducing raindrop impacts and filtering sediment from overland flows directly increases the potential to source and route sediment from areas impacted by motorized vehicle traffic. Erosion losses from these sites can reduce soil productivity and produce sediment that can affect water quality and fish habitat when routed to streams, wetlands, and lakes.

The extent to which motorized access off designated routes, localized vehicular traffic, and dispersed camping have affected the soil resource is variable according to the physical characteristics of the soil, the physiographic position on the landscape, and the intensity of use. All three uses have increased over the last decade as motorized recreational populations increase and more people disperse camp. Soils across both forests are susceptible to compaction from continued motorized traffic, with those located in riparian locations somewhat more so due to generally finer surface textures.

Motorized Access off Designated Routes

Approximately 625,430 acres on the Deschutes National Forest and 431,784 acres on the Ochoco National Forest are currently open for year round or seasonal motorized access off of designated routes. Off Highway Vehicle (OHV) and automobiles access off of designated routes has variably incurred compaction and displacement of the soil resource throughout the two National Forests. Impacts to the soil resource are more concentrated where play areas and hill climbs have been created, and less concentrated when associated with point to point and loop trails. Play areas tend to have extensive soil disturbance as a result of continual use of hill climbs and high density trails that creates contiguous areas of displaced top soil, exposed mineral soil and denuded vegetation. Cross country trails tend to impact a lesser percentage of the land base by creating relatively narrow trails at varying densities across the landscape.

Soils where play areas or trails have been created by motorized access off designated routes have had physical and vegetated characteristics affected by OHVs and automobile traffic. Motorized access off designated routes generally displaces the surface organic matter from the pathway, compacts the mineral

soil, and physically crushes existing vegetation where traffic occurs. Compaction and displacement combine to reduce the productivity of the soil on affected areas, while continued traffic limits the re-growth and cover of live vegetation on and immediately adjacent to the path of travel. Compaction of the surface mineral soil on gentle grades destroys structure and decreases pore spaces between mineral soil grains, directly decreasing water infiltration rates and increasing overland flow rates and energies. These conditions in turn increase the potential for erosion and transport of sediment from these areas.

Hill climb sections of user-created trails are often too steep in grade, creating conditions that displaces mineral soil and gullies the trail. Most trail sections lack adequate drainage and are generally not maintained to minimize erosion or gullying of the trail tread. Trail sections with these conditions that are not located near water are primarily losing productivity due to the erosional loss of surface organic and mineral soil horizons. Trails located near water that do not have sufficient drainage structures to keep them from being hydrologically connected to the stream network are capable of contributing sediment directly to streams, as well as incurring localized loss of productivity.

Motorized Access for Dispersed Camping

Localized vehicular traffic for access to dispersed camping or other activities has variably disturbed the soil resource across the two forest area. The effects to the soil resource are similar to those described for motorized access off designated routes. Continual use of an area by vehicles for dispersed camping or day use parking generally results in compacted soil and a surface denuded of vegetation. These areas are present across the project area where desirable dispersed camp sites, generally along stream courses, have been used for many years.

Dispersed camping - Inventories of dispersed sites across the planning area are derived from Forest Plan era surveys on the Ochoco and Grassland, or from a combination of Forest Plan era and more recent surveys on the Deschutes. The majority of sites are within 100’ of streams, lakes and wetlands, including 905 sites on the Deschutes and 214 sites on the Ochoco and Grassland. Summaries of inventoried sites queried from GIS include:

- sites within 100’ riparian buffers; (Deschutes = 905; Ochoco/Grassland = 214)
- sites located within 300’ of an open road that also has a stream or wetland within 300’ (“special provision riparian areas”); and
- sites within non-riparian upland locations greater than 300’ from an open road.

The creation and continued use of dispersed campsites adversely affects the soil resource by compacting mineral soil and reducing vegetative cover, especially in areas where vehicles traffic or tents are set up. Compacted conditions and continued traffic keep the surface denuded of vegetation and limit the recovery of vegetation in traffic areas during the growing season. As a result, the extent of impact within a dispersed site tends to expand and/or become more barren over time as the duration and intensity of use increases. Impacted areas generally have decreased infiltration rates and lower surface cover that can contribute to an increase in the amount and energy of overland flow during rainfall events, thereby increasing the risk of erosion from the site and sediment contribution to streams if the site is hydrologically connected to the stream network.

Site Specific Areas - The majority of dispersed campsites across the planning area are associated with water features or other desirable destinations that have been used for many years. The following areas listed in Table 3-38 have been identified by District and Forest personnel as having high levels of impact from motorized access for dispersed camping and/or motorized access off designated routes. Best professional

judgment was used to estimate the extent of existing impacts in these areas and potential changes as a result of implementing the Travel Management Rule and site specific OHV trail projects proposed across the planning area.

Table 3-38 Site Specific Areas of High Impact on the Deschutes and Ochoco National Forests

Site	Total Existing acres of impact	Estimated acres or miles under Alternatives 2 & 3	Assumptions for change under Alternatives 2 & 3
Crane Prairie Reservoir	60 acres	30	assumes 50% of currently impacted area is from unauthorized travel
Wickiup Reservoir	910 acres	450	assumes 50% of currently impacted area is from unauthorized travel
Whychus Creek crossing area	20 acres	4	majority of existing impact is from unauthorized travel
Meadow Lakes	20 acres	10	user created trails to be closed and setback of motorized access for dispersed sites back 30' from waters edge
Metolius/Jack Creek/Canyon Creeks	9 acres	3	decrease in unauthorized travel
McKay Creek (Ochco National Forest)	9,000 acres	200	Area closure for unauthorized travel and designation of sites for dispersed camping.
Lava Rock unauthorized trails (Des. National Forest)	100+ miles	~207 miles	Site specific Lava Rock OHV EIS proposes to designate trail system in area
Green Ridge unauthorized trails (Des. National Forest)	~100 miles	0	Travel Management Rule to close unauthorized trails

Alternative 1

Under the No Action alternative, approximately 625,430 acres on the Deschutes National Forest and 431,784 acres on the Ochoco National Forest would remain open for year round or seasonal motorized access off of designated routes. Although the access and use of areas open to motorized travel varies widely due to slope, rock and vegetation constraints, the soil resource on the majority of these acres would remain susceptible to additional impacts from motorized access off designated routes, and motorized access for dispersed camping. Unrestricted motorized access off designated routes would likely expand the extent of compacted and displaced soil as existing trails continue to be used and new trails were formed.

In general, the soil resource is likely to remain in a detrimental condition in areas currently impacted by motorized vehicle use, while new areas of the soil resource would incur additional detrimental soil conditions as motorized use expands and increases. As overall recreation use numbers increase across the two forests, additional impacts to the soil resource are most likely to occur adjacent to the heavily used existing dispersed camping or unauthorized trail areas described in Table_1.

Motorized Access off Designated Routes

Unauthorized trails have increased in number over the past decade as motorized vehicle users explore and expand their range across public lands. Unrestricted motorized access off of designated routes under Alternative 1 would continue to allow the creation and use of unauthorized trails across the two forest area. The soil resource would continue to be adversely impacted by vehicle tires on existing unauthorized trails, maintaining the soil resource in a detrimental condition on the tread of these trails. Although the existing number of user created trail miles across the two forests is unknown and inventories are not complete, the Lava Rock and Green Ridge areas on the Deschutes National Forest have an estimated 200 miles of unauthorized trails alone. More miles of unauthorized trail are likely to exist across the two forest area.

For comparison, approximately 370 miles of OHV trails are currently designated across the 1,057,214 acres of Deschutes and Ochoco National Forest lands open to motorized access off of designated routes. None of the alternatives analyzed under this EIS would alter the existing miles of designated trail. The 370 miles of designated trails constitutes less than .0003 miles of trail per acre of forest open to motorized vehicles. Conservatively estimating the miles of existing user-created trails at double the existing designated trail miles would generate a figure of .001 miles of existing designated and unauthorized trails per acre of open Forest lands. Although it is not known at what rate new trail miles are being created, the percentage of the land base currently committed to detrimental conditions by this activity can be estimated as follows:

- .001 miles of existing designated and user unauthorized trail/acre of open national forest lands = 5.3 ft of trail/acre;
- 5.3 ft of trail/acre converts to 25 ft^2/acre using an average 5 ft trail width;
- 25 ft^2/ 43,560 ft^2 x 100 = .05% of the land base.

Although localized conditions are likely to be more concentrated than this, the percentage of the soil resource committed to a detrimental condition as a result of motorized access off of designated routes and associated unauthorized trails is very low (less than 1/10 of 1 percent) at the Forest or 4th field watershed scale (see Hydrology section).

Continued unrestricted motorized access off of designated routes under Alternative 1 would incur additional soil disturbance in the form of compaction of mineral soil and the displacement of surface organics where new trail routes were created. Detrimental soil conditions would be incurred on the trail tread of new routes if they were trafficked regularly and became definable trails. Although the rate at which new trail miles would be created is not known, the current trend of use and trail creation would be expected to continue under legal cross country motorized travel. However, the combination of existing unauthorized and potentially newly created trails would still represent a very small percentage of the Forest land base. The extent to which these activities would alter soil productivity at the watershed or Forest scale is not known with the data available at this time.

Unauthorized motorized access off of designated routes on buttes and other topographic features would continue under Alternative 1. Use of existing play areas would continue to occur while uncontrolled development of new play areas is likely to occur under this alternative. Development and use of play areas by motorized vehicles has been observed to detrimentally compact and displace the soil resource on a localized basis. Many of these areas on the Deschutes National Forest are located on cinder cones or buttes with soils sensitive to displacement, while many hill climb features on the Ochoco National Forest have soils sensitive to compaction and nearby surface water features that are susceptible to receiving sediment from compacted and denuded soil.

Direct impacts to the soil resource from OHV play areas have been observed at levels capable of reducing soil productivity and denuding vegetation from a concentrated area of use. Direct effects to the soil resource from motorized vehicles in play areas include the displacement of surface organics and mineral soil from the site and compaction of subsurface soil layers. Indirect effects include the reduction of soil productivity, the loss of vegetative and organic cover on the surface, and the erosional loss and transport of sediment to toe slopes or streams. These impacts have been shown in the literature to incur detrimental soil impacts on a localized basis that are extensive enough to impact the productivity of the soil resource in these areas and contribute sediment to streams (Ouren, et al. 2007)

OHV activity on trails and play areas can also produce appreciable amounts of dust. The soils within the planning area are susceptible to producing dust due the fine ash content and/or the susceptibility of pumiceous material to breakdown into finer particles from motor vehicle tires. The amount of dust generated is directly related to the surface area of trails and play areas denuded of vegetative cover, the number of OHVs operating, and the surface moisture conditions at the time of activity. Dust suspended in the air is generally transported away from the site and deposited onto vegetation. Accumulations of dust on vegetation can disrupt photosynthetic and respiration processes, leading to reduced plant growth, reproduction, and survivorship. Fugitive dust composed of lightweight soil particles (including silt and clay) has the potential to impact more total area than other impacts of paved or unpaved roads (Forman and others, 2003). This dust can have significant effects on ecosystems (Westec, 1979) when transported onto vegetation and human health (Kenedi, et al., 2000) when suspended in the air.

Motorized Access for Dispersed Camping

There would be no change to the access of motorized vehicles for the purpose of dispersed camping under Alternative 1. Existing access roads to dispersed sites across both forests are located on both upland and riparian soils and can range from completely denuded, exposed natural surface roads to vegetated, “two track” roads. The access roads located on riparian soils are susceptible to excessive rutting when traveled during the late fall or early spring wet seasons. Other impacted areas associated with motorized access for dispersed camping include the parking and turn around areas at the dispersed sites themselves, many of which do not have physical bounds for defining traffic flow. Soils are generally detrimentally compacted from continued vehicle traffic and are unlikely to recover due to the continued use.

Direct and Indirect Effects

The majority of existing dispersed sites have access roads used by motor vehicles that would be maintained in a detrimental condition by continued use, especially in the high use areas identified in Table 3-X, Site Specific Areas of High Impact on the Deschutes and Ochoco National Forest’s . The unbounded conditions maintained under this alternative often result in heavily denuded impacts immediately adjacent to stream channels and waterbodies where the majority of dispersed campsites are located. Detrimental soil conditions are likely to persist and even expand in dispersed camping areas adjacent to streams and other waterbodies under the No Action alternative.

New areas of the soil resource could be impacted under this alternative as users continued to create new access for dispersed camping. Dispersed camping and other vehicle use for access are assumed to increase in the future under this analysis as state and local community populations continue to grow. High use holiday and hunting weekends often exceed campground capacities and generally push additional campers to disperse camp. It is assumed that this trend would increase the use of existing sites and that additional dispersed sites across the two forest area are likely to be created under this alternative. This trend would incur additional impacts to the soil resource where existing sites are expanded or new sites are created. These

impacts are likely to adversely affect the soil resource on a localized level if the newly created sites are desirable and functional for camping and receive continued use. Although the rate and extent of this impact is not predictable, the general trend rate for this increase is expected to be relatively low.

Alternatives 2 and 3

In general, the implementation of the action alternatives would have a positive effect on the soil resource by reducing the amount of area on which motorized vehicle traffic would be designated. Although no active restoration of areas removed from motorized travel is proposed by this decision, some level of recovery to the soil resource in these areas is expected over time due to freeze-thaw processes that promote improvements to soil strength and the re-growth of vegetation.

Prohibiting motorized access off designated routes and motorized access for dispersed camping outside of 300' of an open designated route is likely to decrease the extent of the soil resource being maintained in a detrimental condition across the two forest area. The following changes would result in positive effects to the extent of detrimental conditions on the soil resource.

- The restriction of motorized travel off designated routes would limit the formation of additional user-created trails and begin to allow existing user-created trails (that were not designated for long term use under site specific trail projects) to recover from impacted conditions.

- The restriction of motorized access for dispersed camping to existing designated or defined sites in the high use dispersed camping areas listed in Table 3-X, as well as in the newly designated "special provision riparian areas", would decrease the extent of the soil resource impacted by motorized vehicles in these areas.

- The proposed 30' setback from stream channels would have a beneficial effect, as it would decrease the extent of impacted soil susceptible to contributing sediment to streams, although areas of new impact on the soil resource could develop as users create new parking areas to compensate for the change.

- These alternatives would maintain or slightly reduce the amount of area impacted within 300' of designated routes by limiting motorized access off designated routes to the sole purpose of ingress and egress to disperse camp. These general provision areas also limit access to the season of use for the road and the type of vehicles allowed on the road. This may limit or restrict off-highway-vehicle use in some areas that would be allowed under Alternative 1.

Motorized Access off Designated Routes

Implementation of Alternative 2 or 3 would indirectly affect the soil resource by reducing the amount of land open to motorized vehicle traffic. Approximately 625,430 acres on the Deschutes National Forest and 431,784 acres on the Ochoco National Forest currently open for year round or seasonal motorized access off of designated routes would have traffic restricted to designated routes only. The removal of unauthorized motorized vehicle traffic from these areas would generally have a beneficial effect on the soil resource by eliminating the physical disturbance that currently maintains a detrimental level of compaction on continually trafficked areas, or that could increase the extent of these conditions across the landscape by creating new trails.

Sites that are currently impacted as a result of motorized access off of designated routes would be expected to slowly recover over time at a rate dependent on the productivity, moisture level and extent of impact on the site. Most areas that have impacts from motorized travel off designated routes are likely to see steady vegetative recovery after motorized vehicle traffic is removed. Impacted areas located on riparian soils are likely to have a quicker recovery of vegetation than those on upland soils due to higher moisture regimes and general productivity. The following recovery rates have been estimated for soils located on sites that would no longer have impacts from motorized access off designated routes.

- 0-5 years – increase of 0-10% vegetative cover
- 5-10 years – 10-25% vegetative cover on these sites
- more than 10 years – up to 30% vegetative cover on these sites

Given time, local soils are capable of recovering from compaction via freeze-thaw, rooting and ground burrowing mechanisms. Compacted areas from railroad era logging operations have been observed to have recovered to soil strengths that are only slightly elevated from natural levels some sixty plus years after they were impacted, and have been observed to support varying amounts of native herbaceous and shrub vegetation under these conditions. Active restoration of these sites is not proposed under this decision; however, there would be a slow recovery of detrimental compaction in the soil profile and a return of vegetation on most sites if motorized traffic was discontinued.

Motorized Access for Dispersed Camping

Alternative 2 would manage approximately 105,638 acres of "special provision" areas on riparian corridors and uplands across both forests (51,044 ac on the Deschutes National Forest; 54,594 ac on the Ochoco National Forest). Alternative 3 increases the amount of "special provision" riparian and upland acreage to approximately 529,057 acres, including 404,730 acres on the Deschutes National Forest and 124,327 acres on the Ochoco National Forest. This reflects the change of all acres managed as "general provision" restrictions under Alternative 2 to "special provision" restrictions under Alternative 3.

Alternatives 2 and 3 would have a positive effect on the soil resource by restricting motorized access for dispersed camping to within 300' of the centerline of all designated routes under either special provision upland or general provision restrictions. This restriction could be reasonably expected to reduce the creation and/or use of dispersed sites greater than 300' from an open road. Although this restriction would not affect where dispersed camping would be allowed within 300' of designated roads in Alternative 2 general provision areas, it would allow for the natural recovery of existing sites greater than 300' from roads from the impacts of motorized access and dispersed camping under both alternatives. Although no active restoration of currently impacted areas that would be restricted to motorized travel under this decision is proposed, some level of soil resource recovery is expected over time due to freeze-thaw processes that promote improvements to soil strength and the re-growth of vegetation.

Special Provisions: Alternatives 2 and 3 would both benefit the soil resource within the "special provision" riparian areas by pulling back vehicular traffic and parking for dispersed camping at least 30' from stream banks. This change is estimated to reduce the extent of impact associated with the dispersed sites along one third of the stream edge. As a result, effective cover capable of reducing raindrop impacts and filtering overland flows is expected to increase as riparian soils within the 30' setback recover. This would be expected to reduce erosion and sediment production from these sites during storm events.

Despite the special provision 30' vehicle setbacks from stream channels, most sites will likely remain susceptible to some level of erosion and sediment production. Although the overall amount of the soil resource impacted within these sites is assumed to decrease as a result of the setbacks, compacted and denuded areas with the potential to convey overland flows and any associated sediment to stream channels or waterbodies adjacent to the site will remain. Soils located within the vehicle setback buffers are not expected to fully recover from current impacts due to continued foot and tent camping use. However, there is likely to be enough reduction of impacts to allow for some natural improvement of compacted conditions over time and the recovery of vegetative growth on portions of the area.

Additional adverse effects to the soil resource in the form of compaction could be incurred adjacent to existing sites as new parking areas are created to compensate for the vehicle setback restrictions. These areas would be further from the stream channels and likely to contribute a lower percentage of eroded soil to the stream channels than the existing areas of impact adjacent to the stream that they would replace.

Alternatives 2 and 3 would both have a positive effect on the soil resource in areas restricting motorized access for dispersed camping under "special provision" restrictions within upland or riparian areas. Motorized travel would be limited in these areas to designated routes for the sole purpose of accessing existing, designated or defined disperse sites. This restriction would effectively limit motorized vehicles from creating new access routes or dispersed sites within 300' of designated routes or within 100' of streams, lakes and wetlands. As a result, existing levels of impact to the soil resource would not be expected to increase in the areas designated as "special provision" under either alternative. This reduction of impacts would occur over approximately 423,419 more acres under Alternative 3 than Alternative 2.

Alternative 2

Motorized Access for Dispersed Camping

Alternative 2 includes approximately 353,686 acres on the Deschutes National Forest and 69,733 acres on the Ochoco National Forest in which motorized access for dispersed camping would be managed under "general provisions". Motorized access for the purpose of dispersed camping within areas designated as "general provision" would be allowed anywhere within 300' of designated roads, including areas of the soil resource that are currently not impacted by vehicle traffic. Approximately 423,419 acres of Forest land within 300' of system roads would be susceptible to compaction and disturbance of the soil resource from vehicle traffic and parking for dispersed camping. As a result, areas without vegetation capable of inhibiting travel near desirable destinations would be susceptible to new vehicular traffic capable of crushing vegetation and compacting the soil.

Although the potential extent of impacts from motorized access for dispersed camping under "general provision" restrictions is not known, the rate at which new access from vehicles would occur is expected to be relatively low. Newly compacted conditions would be expected to be localized and not likely increase detrimental soil conditions to levels capable of altering the productivity of the soil outside the immediately impacted area. Current dispersed use across the two forests appears to generally use existing routes for access and camping. Some areas, such as the East Fort Rock OHV trail system, have had newly created sites observed within them over the past few years as a result of increased use during high volume weekends. This trend is likely to continue where the topography and vegetation do not appreciably inhibit travel and parking.

Alternative 3

Motorized Access for Dispersed Camping

All areas designated with "general provision" restrictions under Alternative 2 would have "special provision" restrictions under Alternative 3. The majority of these acres are located on upland soils across the two forest planning area. This designation would increase the area in which motorized access for the purpose of dispersed camping would be restricted to access only existing, designated or defined sites by approximately 353,686 acres on the Deschutes National Forest and 69,733 acres on the Ochoco National Forest (Table 2-4). This would reduce the susceptibility of 423,419 acres across the two forests to potential effects on the soil resource from unrestricted motorized access for dispersed camping. This would indirectly benefit the soil resource by reducing the possibility of newly created motorized vehicle access, parking spots and dispersed sites within 300' of designated roads across all of these acres.

Hydrology

Executive Summary

Motorized access off designated routes and motorized access for dispersed camping can reduce stream shading, increase sediment delivery to streams, water bodies, and wetlands, and affect vegetation and water movement in riparian areas. Implementation of Alternatives 2 or 3 would have a positive effect on water quality and wetland function. Both action alternatives would reduce the amount of motorized access off designated routes, limit access to designated, defined, or existing dispersed campsites within 300' of designated open roads near stream courses, wetlands, and waterbodies, and establish a 30' setback for motorized access to existing dispersed campsites near streams, wetlands, and waterbodies. Due to this there would not be adverse direct, indirect, or cumulative effects to water temperature, sediment load, or wetlands.

Alternative 2 and 3 would result in increased stream shading over time but the affected area would be small and scattered and would not result in a measurable change in water temperature from Alternative 1. Implementation of the action alternatives would result in decreases in sediment delivery primarily as a result of reductions in motorized access off designated routes and implementation of special riparian provisions for dispersed camping. However, it would be hard to quantify due to the scattered nature of the disturbance, connectivity to streams, water bodies, and wetlands, and the timing and magnitude of runoff events. Effects to water quality and wetlands would be similar under Alternative 2 and 3 because special riparian provisions apply to both alternatives, and applying special provisions to dispersed camping areas further than 300' from streams, waterbodies, and wetlands in Alternative 3 would have little affect to water quality or riparian function. Both action alternatives would meet state and tribal water quality standards, Executive Order 11988 (floodplain management), Executive Order 11990 (wetland protection) and Executive Order 12088 **(**federal compliance with pollution control standards**).**

Affected Environment

Watersheds

Watersheds are natural divisions of the landscape and the basic functioning unit of the hydrologic system. Watersheds are hierarchical – smaller ones nested within larger ones. For the purpose of analyzing and summarizing aquatic and vegetative data a hierarchy of watersheds and watershed boundaries was developed by the region using U.S. Geological Survey (USGS) protocols. Identification of these watersheds follows the USGS numeric Hydrologic Unit Coding (HUC) system. Environmental changes commonly accumulate

and appear on a watershed basis. A list and map of the individual basins, sub basins, and watersheds within these areas is included in Table 3-39 (Watershed Table). Figure 3-4 (Watershed Map) illustrates the relationship of these basins and sub basins to the planning area. The planning area for this project is within the John Day, Deschutes, Klamath, and Oregon Closed Basins. As can be seen in the Watershed Map, the planning area is in 11 sub basins which are further broken down into 56 watersheds. All watersheds with a three character map key on the Watershed Map overlap one of the National Forests and/or the Grassland.

Table 3-39 – Watershed Table

Field	Area	Name	Hydrologic Unit Code	Map Key
1st	**Region**	**Pacific Northwest**	**17**	
2nd	**Sub-Region**	**Middle Columbia River**	**1707**	
3rd	**River Basin**	**John Day River**	**170702**	**J**
4th	**Sub-Basin**	**Upper John Day River**	**17070201**	**J1**
5th	**Watershed**	**Mdl SFk John Day River**	**1707020103**	**J1c**
		Lwr SFk John Day River	**1707020105**	**J1e**
		Upr Middle John Day River	**1707020112**	**J1l**
		Mountain Creek	**1707020113**	**J1m**
		Rock Creek	**1707020114**	**J1n**
4th	**Sub-Basin**	**Lower John Day River**	**17070204**	**J4**
5th	**Watershed**	**Bridge Creek**	**1707020403**	**J4c**
3rd	**River Basin**	**Deschutes River**	**170703**	**D**
4th	**Sub-Basin**	**Upper Deschutes River**	**17070301**	**D1**

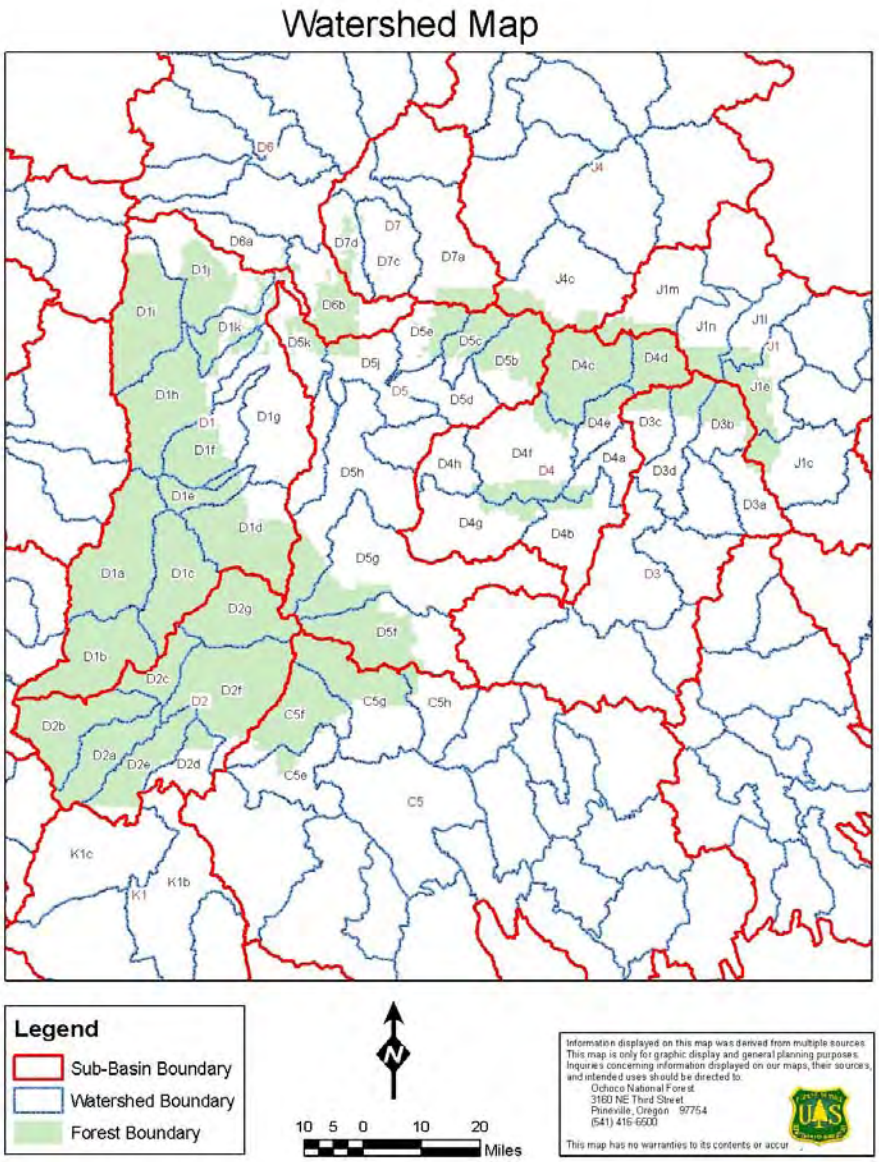
Field	Area	Name	Hydrologic Unit Code	Map Key
5th	**Watershed**	**Crane Prairie**	**1707030101**	**D1a**
		Wickiup	**1707030102**	**D1b**
		Fall River	**1707030103**	**D1c**
		Pilot Butte	**1707030104**	**D1d**
		Tumalo Creek	**1707030105**	**D1e**
		Deep Canyon	**1707030106**	**D1f**
		Middle Deschutes	**1707030107**	**D1g**
		Whychus Creek	**1707030108**	**D1h**
		Upper Metolius River	**1707030109**	**D1i**
		Lower Metolius River	**1707030110**	**D1j**
		Lake Billy Chinook	**1707030111**	**D1k**
4th	**Sub-Basin**	**Little Deschutes River**	**17070302**	**D2**
5th	**Watershed**	**Upr Little Deschutes River**	**1707030201**	**D2a**
		Crescent Creek	**1707030202**	**D2b**
		Middle Little Deschutes R	**1707030203**	**D2c**
		Sellers Creek	**1707030204**	**D2d**

Field	Area	Name	Hydrologic Unit Code	Map Key
		Little Walker Mountain	**1707030205**	**D2e**
		Long Prairie Slough	**1707030206**	**D2f**
		Lower Little Deschutes R	**1707030207**	**D2g**
4th	**Sub-Basin**	**South Fork Crooked R**	**17070303**	**D3**
5th	**Watershed**	**South Fork Beaver Creek**	**1707030307**	**D3a**
		Upper Beaver Creek	**1707030308**	**D3b**
		Paulina Creek	**1707030309**	**D3c**
		Lower Beaver Creek	**1707030310**	**D3d**
4th	**Sub-Basin**	**Upper Crooked River**	**17070304**	**D4**
5th	**Watershed**	**Crooked River abv North Fk**	**1707030401**	**D4a**
		Camp Creek	**1707030402**	**D4b**
		Upper NFk Crooked River	**1707030403**	**D4c**
		Deep Creek	**1707030404**	**D4d**
		Lower NFk Crooked River	**1707030405**	**D4e**
		Upper Crooked R Valley	**1707030406**	**D4f**
		Bear Creek	**1707030407**	**D4g**

Field	Area	Name	Hydrologic Unit Code	Map Key
		Prineville Reservoir	**1707030408**	**D4h**
4th	**Sub-Basin**	**Lower Crooked River**	**17070305**	**D5**
5th	**Watershed**	**Upper Ochoco Creek**	**1707030502**	**D5b**
		Mill Creek	**1707030503**	**D5c**
		Lower Ochoco Creek	**1707030504**	**D5d**
		McKay Creek	**1707030505**	**D5e**
		Badlands	**1707030506**	**D5f**
		Upr Dry River	**1707030507**	**D5g**
		Lwr Dry River	**1707030508**	**D5h**
		Lwr Crooked River Valley	**1707030510**	**D5j**
		Crooked River Grassland	**1707030511**	**D5k**
4th	**Sub-Basin**	**Lower Deschutes River**	**17070306**	**D6**
5th	**Watershed**	**Hdwtrs Deschutes River**	**1707030601**	**D6a**
		Willow Creek	**1707030602**	**D6b**
4th	**Sub-Basin**	**Trout Creek**	**17070307**	**D7**
5th	**Watershed**	**Upper Trout Creek**	**1707030701**	**D7a**

Field	Area	Name	Hydrologic Unit Code	Map Key
		Hay Creek	**1707030703**	**D7c**
		Mud Springs Creek	**1707030704**	**D7d**
2nd	**Sub-Region**	**Oregon Closed Basins**	**1712**	
3rd	**River Basin**	**Oregon Closed Basins**	**171200**	**C**
4th	**Sub-Basin**	**Summer Lake**	**17120005**	**C5**
5th	**Watershed**	**McCarty**	**1712000505**	**C5e**
		Pine	**1712000506**	**C5f**
		Devils Garden	**1712000507**	**C5g**
		Walker Creek	**1712000508**	**C5h**
1st	**Region**	**California**	**18**	
2nd	**Sub-Region**	**Klamath/N California Co**	**1801**	
3rd	**River Basin**	**Klamath**	**180102**	**K**
4th	**Sub-Basin**	**Williamson**	**18010201**	**K1**
5th	**Watershed**	**Klamath Marsh/Jack Cr**	**1801020102**	**K1b**
		NW of Klamath Lake	**1801020103**	**K1c**

Figure 3-4 – Watershed Map (Map Key in Table 3-39)

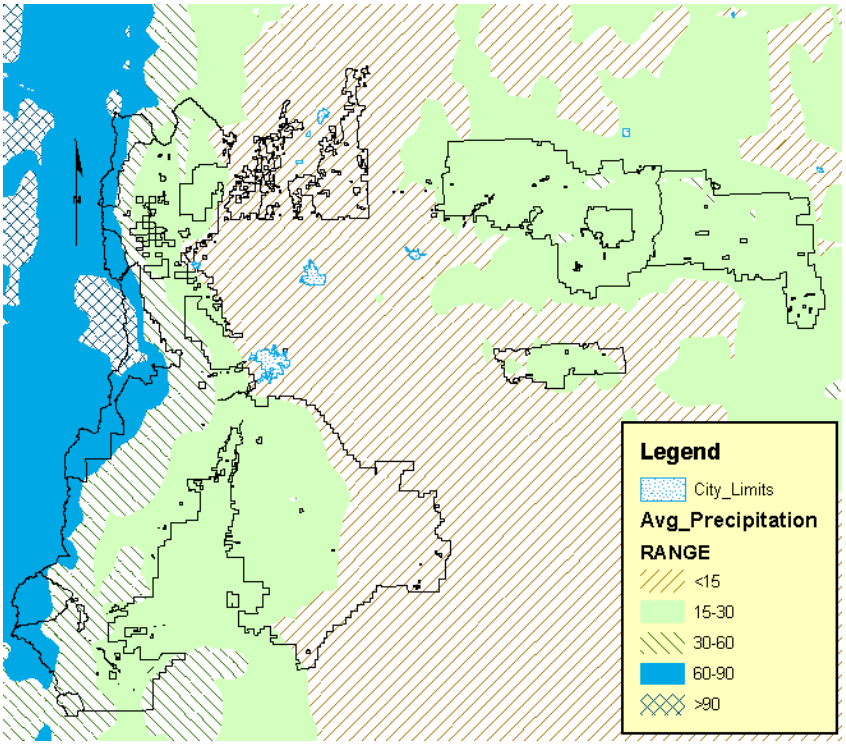


Climate

Most of the analysis area has a climate of relatively low precipitation and humidity, large daily temperature fluctuations throughout the year, and high evaporation rates, with increasing precipitation and cooler temperatures as elevation increases to over 9,000 feet in the Cascades. The planning area is in the rain shadow of the Cascade Mountains with the majority of the precipitation falling on the west side of the divide resulting in a dryer climate in the Deschutes, John Day, Klamath, and Oregon Closed Basins. Summers are typically hot and dry and winters cool and moist. Prevailing winds are generally southwesterly through westerly.

Mean annual precipitation in the analysis area varies from a minimum of less than 10 inches per year in parts of the Crooked River National Grassland, to a maximum of about 33 inches per year in the Ochocos, and 140 inches per year at higher elevations in the Cascades on the Deschutes National Forest. Precipitation generally increases with increased elevation, and on the Ochoco National Forest also tends to increase progressively northward. Figure 3-5 shows average annual precipitation bands in the analysis area.

Figure 3-5 – Average Annual Precipitation



The majority of precipitation in the planning area occurs between November and March with most of it falling as snow at higher elevations. November, December, and January normally have the highest total monthly precipitation. Total precipitation usually declines through March and April then increases again in May and June as frontal movements bring late spring rains. July, August, and September have the lowest average monthly precipitation. August normally has slightly higher precipitation than July or September due to summer thunderstorms which may be intense in limited areas. At lower elevations, the highest recorded total monthly precipitation for June, July and August may approach the highest recorded precipitation for the wet months of November and January due to the infrequent occurrence of intense summer thunderstorms. In dry years there may be no precipitation during some of the dryer months.

Water Quality

The planning area is highly variable geologically, chemically, and biologically. The Ochoco National Forest and Crooked River National Grassland, and much of the Upper Deschutes Sub Basin are in the Blue Mountains ecoregion, however almost all the watersheds on the Deschutes National Forest drain the Eastern Cascades Slopes and Foothills ecoregion or at higher elevations the Cascades ecoregion.

In the summer of 1997 and 1998, the Oregon Department of Environmental Quality collected water samples in the Deschutes Basin above Lake Billy Chinook for physical and chemical analysis, as part of the EPA sponsored Regional Environmental Monitoring and Assessment Program (R-EMAP). Samples were collected at 49 stations in the basin. Parameters determined in the field were water temperature, Dissolved Oxygen (DO), pH, conductivity, and turbidity. Parameters analyzed in the lab were biochemical oxygen demand-5, total solids, ammonia-N, nitrate-N, total P, sulfate, total Kjeldahl-N, alkalinity, chemical oxygen demand, dissolved organic carbon, and total suspended solids. DEQ split the basin into three sub basins: the Metolius, the Deschutes, and the Crooked River (not the same as USGS sub-basins). The Metolius was classified as excellent, The Deschutes as poor to excellent, and the Crooked as very poor to excellent. The portion of the John Day Basin and the Lower Deschutes and Trout Creek USGS Sub-Basins in the planning area should be comparable with the Crooked River. A more detailed description of procedures, results, and conclusions can be found in the chemistry summary of the "Upper Deschutes River Basin R-EMAP" (DEQ, 1999).

As specified in the Clean Water Act of 1972 and subsequent amendments, water quality includes all attributes that affect existing and designated uses of a body of water which include fisheries and habitat needs as well as human uses. The Clean Water Act requires states to review all available water quality data every 2 years and where Best Management Practices (BMPs) or technology based controls are insufficient to achieve desired water quality conditions, classify the body of water as "water quality limited." Non-point pollution is the primary cause of impaired waters on Federal Lands in the planning area. These can not be tied to a point source such as a discharge pipe from a factory but are best controlled by good land management practices. A list of streams and water bodies on the 2004/2006 Oregon State 303(d) List of impaired waters for the Deschutes and Ochoco National Forests is included in Appendix B-3 – (**Table B3.1.1).** The Oregon Department of Environmental Quality (DEQ) has made a call for data for the 2008/2010 list, but it is not expected to be completed until late 2010 or early 2011.

96 streams and water bodies were listed as impaired waters on the State 303(d) List for water temperature, sediment, turbidity, pH, Dissolved Oxygen (DO), and chlorophyll a on the two Forests and Grassland. pH, Dissolved Oxygen (DO), and chlorophyll and will not be analyzed further because the transportation system and camping in designated, defined, and dispersed camping sites would not result in measurable increases in these parameters. There is a potential for non-highway-legal vehicle travel off designated routes and motorized access dispersed camping to affect water temperature, sediment and turbidity and they will be analyzed in detail in this EIS.

Water Temperature – There are 19 streams on the State 303(d) List for water temperature on the Deschutes National Forest, and 73 streams on the Ochoco National Forest and Grassland. Water temperature is an important factor which influences aquatic productivity. Temperature changes may result from natural climatic conditions or human manipulation of the riparian environment. Temperature is a function of flow, surface area, solar input, air temperature, and other variables. Aquatic biota are adapted to certain thermal conditions existing in the habitat for their survival and well being. It is known that physiological stress in fish increase as water temperatures and sediment rates increase.

No measurable increase in water temperature resulting from management practices is permitted in streams listed on the State 303d list of Water Quality Limited Water Bodies for water temperature. The state standard for salmon or trout rearing and migration is a floating 7-day maximum average of 18.0°C (64.4°F) and for bull trout spawning and juvenile rearing 12.0°C (53.6°F). The Confederated Tribes of Warm Springs standard for bull trout in Johnson Creek and the Metolius River from the confluence of Johnson Creek to Lake Billy Chinook is 10.0°C (50.0°F).

Sediment – Suspended sediment is a measure of suspended sand, silt, clay and organic matter which will settle in time to the stream bottom. It may adversely affect fish by filling in pools, reducing bottom fauna, and silting in spawning gravels. The Deschutes River between Wickiup Reservoir and Bend on the Deschutes National Forest and 8 streams in the Trout Creek Sub Basin on the Ochoco National Forest are listed for sediment.

The streams listed for sediment in the Trout Creek Sub Basin were originally listed for embeddedness by the State, based on the Trout Creek Watershed Analysis (Ochoco NF, 1995). This was derived from surveys conducted either while the watershed was in a cattle allotment or shortly after it was changed to a sheep allotment in 1989. Only a short reach on the upper east fork of Auger Creek is still in a cattle allotment. There is no standard in the current state water quality rules for sediment and Total Maximum Daily Loads (TMDLs) have not yet been established for the Deschutes Basin. The portion of the Upper Trout Creek Watershed in the planning area has been in a sheep allotment for about 20 years. The conversion from a cattle allotment to a sheep allotment has resulted in a substantial reduction in channel disturbance, improved bank stability, and reduced sediment load and the Ochoco National Forest will attempt to have the 8 streams removed from the 2008/2010 303(d) List.

Turbidity – Turbidity is the disturbance of water due to the presence of suspended matter such as clay, silt, organic debris, plankton, various effluents, and others. It is an expression of the optical property of a sample of water which causes light to be scattered and absorbed rather than transmitted in straight lines through a sample. Excessive turbidity reduces light penetration into water and therefore reduces photosynthesis by photoplankton, algae, and submerged vegetation. Natural turbidities within watersheds may cause short term readings in excess of the recommended level due to spring runoff or seasonal freshets. Turbidity is often used as a surrogate to indicate changes in suspended sediment. The Deschutes River between Wickiup Reservoir and Bend is listed for turbidity on the Deschutes National Forest.

Municipal Watersheds

A municipal supply watershed is one that serves a public water system as defined in Public Law 93-523 (Safe Drinking Water Act) or as defined in State safe drinking water regulations. The applicable state defined system is a community water system. This is a public water system that has at least 15 service connections used by year-round residents and regularly serves at least 25 year-round residents. There are two municipal watersheds on the Deschutes National Forest and one on the Ochoco National Forest. By definition a municipal watershed does not include wells or confined ground water systems unaffected by Forest Service Activities.

The Bend municipal watershed operates under a 1926 formal agreement between the city of Bend and the Secretary of Agriculture (Forest Supervisor authority now) for 2.603 cfs. The diversion was increased by 15 cfs in 1983. Management within the watershed has been custodial with all actions being subservient to maintaining water quality. The Sisters municipal watershed uses a tributary of Whychus Creek as an emergency backup to their primary water system. The Mitchell municipal watershed diverts water from springs in the Bridge Creek Watershed in the Lower John Day Sub Basin.

Analysis of Environmental Effects

Temperature

State water temperature standards for the project area are found in Oregon Water Quality Standards 340-041-0028(4)(a), (b) and (f), based on Fish Use Maps 130A, 130B, 170A, and 170B. The state standard for salmon or trout rearing and migration is a floating 7-day maximum average of 18.0°C (64.4°F), for salmon

and steelhead spawning and rearing 13.0°C (55.4°F), and for bull trout spawning and juvenile rearing 12.0°C (53.6°F). There are 84 streams on the state 303(d) list of Impaired Waters for water temperature with some being on more than one Forest or Grassland. The Oregon Department of Environmental Quality (DEQ) is working on the Total Maximum Daily Loads (TMDLs) for these streams but they are not expected to be finished until after the EIS is implemented. The closest to completion are the Upper Deschutes, Lower John Day and Upper John Day Sub Basins which are in the data analysis and report writing phase. All others are still in the initial scoping and data collection phase. The Confederated Tribes of Warm Springs water temperature standard for bull trout on Johnson Creek and the Metolius River below Johnson Creek is 10.0°C (50.0°F) and steelhead and salmon spawning and rearing temperature standards round down current DEQ standards to the nearest whole degree Fahrenheit on the Deschutes River below Round Butte Dam. The Riparian Management Objectives (RMOs) for PACFISH and INFISH direct that there should not be any measurable increase in water temperature. The Riparian Management Objectives for the Northwest Forest Plan (Aquatic Conservation Strategy) say that water temperatures would be maintained or restored to a degree that would provide for a stable and productive riparian and aquatic ecosystem. Effects to fish habitat are discussed in Chapter 3 under Fisheries.

Reductions in solar input resulting from shading are a primary factor effecting stream temperature and could be affected by changes in dispersed recreational use. Shade functions (Beschta, et al., 1987) generally occur within 100-200 feet of the channel. This analysis evaluated the area within one cell width (about 100 feet on the Ochoco and Grassland and 30' on the Deschutes) of slope/erosion GIS layer cells (pixels) intersected by perennial streams to address potential water temperature concerns. Within this 30-100 feet, draw bottom roads are a primary contributor of reduced shade. Since trees are removed in the road right-of-way when it is constructed, roads anywhere within the 100 feet may reduce shade. The closer the road is to the stream the more likely there won't be intervening shade. Off road travel and dispersed camping primarily tends to affect shorter vegetation (grass, forbs and shrubs) and disturbance needs to be much closer to affect shade. Field observations of non-highway-legal vehicle and dispersed camping use found that most vegetation affected was less than 2 feet tall with some grubbing or cutting of shrubs and saplings up to 3 or 4 feet observed in campsites.

Approximately 80 percent of solar input into streams occurs between 0800 and 1600 hours during the period when maximum water temperatures occur on the Deschutes and Ochoco National Forests and Grassland (July1 – August 15). The solar angle at 0800 and 1600 hours in Redmond, Oregon, is about 38 degrees and it is approximately 69 degrees at solar noon. The length of shade resulting from vegetation during this period is shown in Table 3-40.

Table 3-40 - Shade Table

Vegetation Height (ft)	**0.5**	**1.0**	**1.5**	**2.0**	**3.0**	**4.0**
Shade Length @ Noon (ft)	**0.3**	**0.6**	**0.9**	**1.2**	**1.8**	**2.4**
Shade Length @ 8 AM & 4 PM (ft)	**0.9**	**1.9**	**2.8**	**3.8**	**5.6**	**7.6**

The direction shade comes from shifts over the day (vegetation on the east bank of a stream does not provide shade in the afternoon) and vegetation further from a stream can overlap shade from vegetation being effected by recreational activities. In addition, more than 70 percent more solar input occurs at noon than at 0800 or 1600 and a quarter of the solar input for the day comes between 1100 and 1300. Therefore, average effective shade loss would be closer to that at noon than to 0800 or 1600.

Sediment

State water quality standards direct that turbidity levels should not exceed background levels by more than 10 percent. There is currently no state water quality standard for sediment. Streams on the state 303(d) list of Impaired Waters for Turbidity and Sediment are shown in Appendix B (Table 3.1.1). Only streams in the Trout Creek Sub Basin are listed for sediment or turbidity on the Ochoco National Forest and only the Deschutes River between Wickiup Reservoir and Bend is listed on the Deschutes National Forest. There are no 303(d) listed streams for sediment or turbidity on the Crooked River National Grassland. The Oregon Department of Environmental Quality (DEQ) is working on the Total Maximum Daily Loads (TMDLs) for these streams but they are not expected to be finished until after the EIS is implemented.

There is normally a close correlation between turbidity and suspended sediment in a given stream, but this correlation can change as organic material increases over the summer or if the percent of sediment from different sources in the drainage changes. Turbidity does not measure the amount of sediment being transported as bedload.

The amount of sediment delivered from surface erosion and mass soil movement outside the stream channel is dependent on soil erosivity, the amount and type of ground disturbance, slope, and distance to the stream. The closer the disturbance is to the channel the higher the potential delivery. This analysis evaluated the area within 300' of streams for sediment related water quality concerns from motorized access off designated routes. Since motorized access for dispersed camping ingress and egress normally do not cross or run directly down ephemeral draws and drainages, sediment delivery would primarily be from overland flow and was analyzed within 100 feet of streams. Dispersed campsites were evaluated on miles of stream on land with 0-20 percent slope because sediment delivery would be primarily from overland flow. There is less likelihood of campsites on steeper slopes, and campsites within 100 feet of streams normally are immediately adjacent to the stream.

Wetlands/Riparian Vegetation

Executive Order 11990 requires agencies to avoid adverse impacts associated with the destruction or modification of wetlands. OHV roads/trails can dissect wetlands and can reduce riparian and wetland vegetation. In addition, these user created trails alter sub-flows and if flows concentrate in the wheel ruts down cutting can accelerate and result in lowering of the water table and loss of wetland vegetation. Compaction and puddling from off road use and dispersed campsites can also contribute to loss or downward trends in riparian vegetation.

Alternative 1

Temperature

Since the Forest Land and Resource Management Plans (LRMP) for the Deschutes National Forest (1990) and the Ochoco National Forest and Crooked River National Grassland (1989) were implemented there has been a substantial increase in dispersed camping on both the Forests and Grassland. It is estimated that one in five Americans over 16 years of age have participated in OHV recreation in the past year with about an 18 percent increase between 1999 and 2007 (USDA FS SRS, 2008). In Oregon the growth rate was even higher with about a 22.2 percent increase. The increase in non-highway-legal vehicle use has closely approximated the national growth rate. However based on personal observation, in the last 5 to 10 years the growth rate of Class 1 OHV (ATVs) use in the planning area appears to have been much higher than this and is expanding out from high use areas.

Motorized Access off Designated Routes & Motorized Access for Dispersed Camping

Water temperature increases from non-highway-legal vehicle trails running parallel to creeks and from stream crossings found in Texas (Taylor, 2006), are not as likely in this planning area due to trees and shrubby vegetation adjacent to creeks. OHV roads/trails and mud bogging have been observed in riparian zones in the planning area (see Figure 3-6) but the disturbance has been at least 3 to 4 feet from the stream and based on Table 3-40 would have very little effect on shading. In addition it would take about seven 8 foot wide stream crossings per mile to reduce shade on a perennial stream by 1 percent and this is more than the amount observed on perennial streams in the planning area (see Figure 3-7). A one percent decrease in shade would not produce a measurable increase in water temperature. OHV use can also reduce shade on intermittent and ephemeral streams but this would not contribute to maximum stream temperatures which normally occur in July and August when these channels are dry. Peak temperatures that occur after about the middle of August normally are the result of low flows instead of lack of shading. Motorized access off designated routes would not have any measurable effect on low flows. Long term stream shade could also be reduced by motor vehicle use preventing the reestablishment of trees on road prisms not on the Forest road system such as old decommissioned roads, temporary roads and skid trails. While the amount is not quantifiable, it would be small and primarily along intermittent streams as an artifact of pre 1994 ground based logging techniques.

Fig. 3-6 - User created road/trail in riparian area

Fig. 3-7 - User created OHV stream crossing

On the two National Forests and Grassland, motorized access off designated routes would continue on 16,624 acres (26 mi²) within 100 feet of perennial streams and motorized access on 0-20% slopes to dispersed campsites on 58,188 acres (90.9 mi²) and is expected to increase at approximately the rate of growth in the tri-county area. This may result in small reductions in shade but would not cause a measurable increase in water temperatures.

Most dispersed campsites that are within areas that permit motorized access are accessed with motor vehicles. Dispersed campsites were inventoried and plotted on forest resource maps in the late 1980s for the Ochoco and Deschutes Forest Plans. Additional recreation site inventory data has been entered on the Deschutes resource map layer since then. The surveys were not exhaustive and many sites were not identified. Based on assumptions related to dispersed recreation growth discussed earlier in this chapter and supported by field observations, there have been substantial increases in the number of dispersed camping

sites in the last 20 years. Summarization of this data in Table 3-41 gives a perspective of dispersed camping use on the two forests and CRNG and its relative affect on shading on perennial streams. As can be seen in Table 3-41, the total area currently affecting shading on perennial streams outside wilderness and large block roadless areas such as that in the Oregon Cascades Recreation Area and Lookout Mountain Management Area is less than one percent.

Table 3-41 - Inventoried Campsites in Areas Open to Motorized Access Dispersed Rec.

Sub Basin	District	Alt1		Alt2/Alt3	
		Within 100' of Perennial Streams	Perennial Streams (%)[1]	Within 100 ft of Perennial Streams	Perennial Streams (%)[1]
Deschutes NF					
Upper Deschutes	**BFR**	**38**	**0.5**	**40[2]**	**0.5**
	CRE	**4**	**0.2**	**5[2]**	**0.3**
	SIS	**35**	**0.4**	**101[2]**	**1.2**
Lower Crooked	**BFR**	**0**	**0**	**0**	**0**
	CRE	**0**	**0**	**0**	**0**
Little Deschutes	**BFR**	**0**	**0**	**0**	**0**
	CRE	**5**	**0.1**	**12[2]**	**0.2**
Ochoco NF/CRNG					
Lower John Day	**LOM**	**2**	**0.1**	**2**	**0.1**
Upper John Day	**LOM**	**1**	**0.1**	**1**	**0.1**
	PAU	**4**	**0.1**	**4**	**0.1**

Sub Basin	District	Alt1		Alt2/Alt3	
		Within 100' of Perennial Streams	Perennial Streams (%)[1]	Within 100 ft of Perennial Streams	Perennial Streams (%)[1]
Lower Deschutes	**CRNG**	**0**	**0**	**0**	**0**
Upper Deschutes	**CRNG**	**0**	**0**	**1[3]**	**0.2**
Trout Creek	**CRNG**	**0**	**0**	**0**	**0**
	LOM	**5**	**0.2**	**5**	**0.2**
Lower Crooked	**CRNG**	**0**	**0**	**0**	**0**
	LOM	**29**	**0.3**	**29**	**0.3**
Upper Crooked	**LOM**	**25**	**0.2**	**24**	**0.2**
	PAU	**22**	**0.6**	**18**	**0.5**
Beaver/S.Fk Crooked	**PAU**	**6**	**0.1**	**6**	**0.1**

[1] As % of perennial stream miles outside wilderness and large block roadless areas assuming 100 ft frontage @ each site. Alt2 & 3 have a 30 ft setback from streams at existing dispersed sites.
[2] Surveyed motorized access dispersed campsites in emergency closure areas for public safety (such as hazard trees from fire) are not counted in Alt 1. Emergency closures are assumed to be lifted in Alt2 & 3.
[3] Existing motorized access dispersed campsite in currently unauthorized area would be in an area open to motorized access for dispersed camping under Alt 2 & 3.

As previously stated, vegetation under 2 feet tall is mostly affected at dispersed camping sites with some grubbing or cutting of shrubs and saplings up to 3 or 4 feet observed. Magill (1970) attributed trampling and tent site clearing for the decrease in tree seedlings, shrubs, forbs and grasses. This was aggravated by vehicles which appear to be the primary ground disturbance outside of the area adjacent to the fire ring on heavy use sites visited on the two Forests and Grassland. Several papers indicated that these impacts leveled off after a couple of years with a shift from intolerant native species to recreational tolerant species (Magill, 1970; James et al., 1979; Merriam and Smith, 1974). However all vegetation except mature trees were obliterated in high use areas. Manning (1979) also reported removal of small stems from the shrub and sapling layer for firewood and poles and observed a top heavy distribution of mature trees in heavy use

areas. Injury to these large trees made them more susceptible to disease and insect attack. Therefore dispersed camping sites initially affect vegetation that shades out 3 or 4 feet, but over time as mature trees die on heavily used forested sites, shading can be reduced from lack of tree recruitment in dispersed sites adjacent to perennial streams. Except in very heavily used sites (especially lakes and reservoirs), field observations noted the depaupered ground did not extend up to the water body and was not substantially reducing shade on perennial streams. On reservoirs, motorized access in the campsite tended to follow the edge of the water as it receded. In some sites such as Wickiup Reservoir, this has resulted in loss of the green line (vegetation associated with the normal high water line). While this reduced surface shade around the edge of the reservoirs, it has a negligible affect on reservoir water temperature due to the large volume of water. The primary effect would be to habitat and hiding cover.

Tables 3-42 and 3-43 show miles of 303(d) temperature impaired streams and miles of perennial streams (including 303(d) reaches) open to motorized access for dispersed camping and their ratios to the total length for the two Forests and Grassland. Only areas in slope class 0-20% were evaluated because motorized access and camping on slope classes greater than 20% are highly improbable.

Table 3-42 – Alt 1 Miles of 303(d) Streams Open to Motorized Access for Dispersed Camping (MADC)

Sub Basin Name	Open MADC Slope < 20% (mi.)	Closed MADC Slope < 20% (mi.)	Total 303(d) Streams (mi.)	Total Open MADC (%)
Deschutes NF				
Little Deschutes	**51**	**6**	**59**	**86**
Lower Crooked	**0**	**0**	**0**	**0**
Upper Deschutes	**82**	**40**	**134**	**61**
Ochoco NF/CRNG				
Lower Crooked	**32**	**9**	**59**	**54**
Lower Deschutes	**0**	**.4**	**11**	**0**
Lower John Day	**2**	**2**	**6**	**33**
SFk. Crooked	**48**	**7**	**62**	**77**

Trout Creek	**21**	**1**	**28**	**75**
Upper Crooked	**94**	**13**	**128**	**73**
Upper Deschutes	**0**	**5**	**9**	**0**
Upper John Day	**15**	**9**	**32**	**47**

Table 3-43 – Alt1 Miles of Perennial Streams* Open to Motorized Access for Dispersed Camping

Sub Basin Name	Open MADC Slope < 20% (mi.)	Closed MADC Slope < 20% (mi.)	Total Perennial Streams outside (mi.)	Total Open MADC (%)
Deschutes NF				
Little Deschutes	**147**	**21**	**182**	**81**
Lower Crooked	**0**	**0**	**0**	**0**
Upper Deschutes	**220**	**201**	**471**	**47**
Ochoco NF/CRNG				
Lower Crooked	**124**	**37**	**222**	**56**
Lower Deschutes	**0**	**3**	**3**	**0**
Lower John Day	**27**	**8**	**52**	**52**
SFk. Crooked	**87**	**12**	**111**	**78**
Trout Creek	**29**	**1**	**39**	**74**

Upper Crooked	**248**	**26**	**315**	**79**
Upper Deschutes	**0**	**5**	**9**	**0**
Upper John Day	**84**	**38**	**164**	**51**

* Some perennial streams are shown in both Table 3-42 & 3-43

Motorized dispersed camping could continue along approximately 993 miles of perennial stream (or about two-thirds of the miles outside wilderness areas, the Oregon Cascades Recreation Area, and the Lookout Mountain Management Area) and is expected to increase at approximately the rate of growth in the tri-county area. This may result in small reductions in shade, but based on the ratio of dispersed sites to total stream length (Table 3-40), would normally not cause a measurable increase in water temperatures. However, contiguous high intensity use sites adjacent to narrower stream channels, could reduce shade over a long enough reach in the future to produce statistically distinct and measurable changes in water temperature. Campsites along wider streams such as the Metolius and the Deschutes River would have a substantially smaller affect due to the small percentage of the water surface potentially shaded by vegetation affected by dispersed camping. Mitigation measures under individual NEPA decisions, usually Categorical Exclusions (CEs), have been taken when these were identified in the past (see Figures 3-11 – 3-14) and while not associated with this proposed action, would probably be addressed in a similar manner if identified in the future under all alternatives.

Sediment

Motorized Access off Designated Routes

Research over the last 60 years has clearly shown that forest roads are a major source of sediment and soil erosion from forest watersheds with some studies concluding that up to 90 percent of the sediment from timber sales comes from roads (Grace and Clinton, (2006), Cafferata and Spittler (1998), Reid and Dunne (1984), Seyedbagheri, McHenry & Platts (1987)). Class 1 & 3 OHV (ATVs and motorcycles) trails normally contribute less sediment than standard roads due their narrower tread but this is offset by user created trails through poor location (steep slopes, draw bottoms, riparian areas), poor drainage, and concentration of flow due to rutting. These adverse effects are most pronounced at stream crossings, where trails run down intermittent stream channels, and where rutting in ephemeral stream channels causes channelization and the loss of filtering.

Sediment delivery is the primary effect of OHV use on streams. These effects will be evaluated using open, closed and decommissioned road densities within 300’ of streams. Road delivered sediment is generated on the road surface, cut & fill slopes, and ditch lines and is transported through drainages (including ephemeral) to be discharged into streams, wetlands, or other water bodies. Probably less than 10 to 15 percent of road/trail delivered sediment originates outside the 300’ analysis buffer. OHV users are extensively using closed and decommissioned roads in areas that do not prohibit motorized access off designated routes, and are often encouraged to do so. In the McKay Creek Watershed in the Lower Crooked River Sub Basin (one of the high impact areas identified) at least three quarters of the closed and mapped decommissioned roads had visible OHV (primarily ATV) use and this accounted for less than half the non-open road use. Less than a tenth of the non-open road use was on routes without some type of pre-existing track. OHV use on closed and decommissioned roads can cause rutting, which channelizes flows, can reduce vegetative filtering, and

can reduce or eliminate the effectiveness of erosion control measures such as water bars. While not all closed or decommissioned roads are used by OHV users, and not all non-system roads, temporary roads, and user created tie-through trails are on the Forest GIS layers, closed and decommissioned road densities provide a perspective of current and potential future use if there is no change in current management direction. Motorized vehicle use of closed and decommissioned roads increases erosion and shifts potential sediment delivery back towards that of an open road. It is estimated that closing a road reduces sediment delivery by about 75 percent and decommissioning by about 95 percent (Parker and Christensen, 1964). Roads would continue to deliver sediment over time even when closed or decommissioned albeit at a reduce level.

Only the Municipal Watershed for the city of Bend is currently closed to motorized access off designated routes. While the Forest GIS layer indicates there are no areas open for motorized access off designated routes in the Sisters Municipal Watershed within 300' of streams, field observations indicate there is currently a light to moderate amount of non-highway-legal vehicle use in the drainage (personal communication with Nate Dachtler, Sisters District Fisheries Biologist). There is some non-highway-legal vehicle use in the Mitchell Municipal Watershed but it is light and mainly on old closed roads (based on personal observations). There are currently 110 acres available for motorized access off designated routes in the Mitchell Municipal Watershed. Water for the Mitchell water supply is diverted from springs which are some distance from existing dispersed camping sites located along FS Road 2630450. Both the Sisters and Mitchell Municipal Watersheds allow motorized access for dispersed camping. The city of Sisters currently uses groundwater from wells for domestic purposes and only maintains facilities in the surface water municipal watershed as an emergency backup. The municipal watershed has not been used for drinking water for several years.

Figure 3-8 - Stream crossing at dispersed site

Figure 3-9- User-created stream crossing

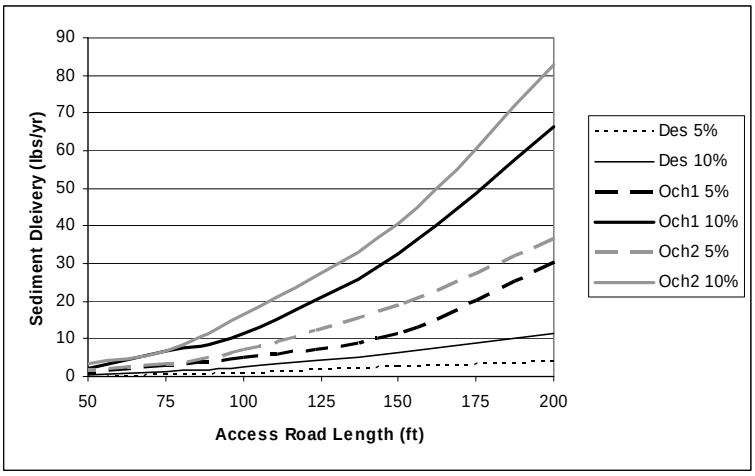
Figure 3-10 - User created road/trail in wet area

Within the 300' being analyzed, draw bottom roads/motorized trails and stream crossings are two of the primary contributors of sedimentation (see Figures 3-8-3-10). In addition draw bottom roads contribute to losses of in-channel and future Large Woody Material recruitment and disrupt streamside water tables. Ricker et al. (2008) found that non-highway-legal vehicle crossings played a major role in sediment delivery in forested areas and actually represented the majority of sediment flux in one drainage while Ayala et al. (2005) concluded that OHV roads/trails played a major role in overall sediment delivery at the subwatershed level. Forest Service GIS layers indicate that within the planning area, there are about 796 miles of open road within 300' of streams and there are an additional 422 miles of inactivated (closed) road and 250 miles of decommissioned.

Motorized Access to Dispersed Campsites

People using motorized vehicles to access dispersed camp sites try to get off open roads to get away from dust and noise and for seclusion. To evaluate the potential sediment delivery to the adjacent stream from the access road, the FS WEPP (Water Erosion Prediction Project) sediment yield model was run for three generalized sites: Wickiup Reservoir (21.42" precip/yr) on sandy loam soils – "Des" and Mitchell (15.38' precip/yr) on silty-loam soils – "Och1" & on loamy soils – "Och2". These are representative of most of the soils across both Forests and the Grassland. The access roads were assumed to be 8 feet wide, on 5-10% slopes, with ruts on native surface, with a 3 foot vegetative buffer on a 3% slope adjacent to the stream. Road lengths evaluated ranged from 50 to 200 feet because personal observations (of the Hydrologist) on the Ochoco National Forest found that 50 feet from the road was about the minimum distance used and 200 feet represented about the maximum distance observed on access roads without a slope break.

Figure 3-11 – Access Road Delivered Sediment (without 30' stream setback)



The sediment delivery projected by the FS WEPP model is probably overestimated for most sites because of selected road condition and because the model assumes the road is at a constant grade (this is especially true on the longer access road lengths). However, it does show access roads can deliver sediment when there is limited filtering between the road and a stream or other water body. This can lead to increased fines in channel substrate with affects being most pronounced if the access route fords a stream. The volume weight for a cubic foot of soil on the two forests generally ranges between 80 pounds (silty clay loam) and 110 pounds (loamy sands).

Recreational use at dispersed campsites can reduce vegetative ground cover and increase soil compaction thereby decreasing filtering and increasing surface erosion and runoff. Trampling crushes, breaks, and bruises stems, leaves, and flower stalks at campsites and can cause the loss of up to 45% of ground cover in the first year (Manning, 1979). Trampling, clearing for campsite expansion, and removal for firewood and poles also causes a decline in the number of tree seedlings and shrubs (Manning (1979), Magill (1970), James et al. (1979)). This trampling causes a change from recreational intolerant natural vegetation to recreation tolerant species. There is also a rapid increase in soil compaction and decrease in infiltration rates. Lutz (1945) found that a trampled sandy soil on a forested picnic area was only one-sixth as permeable as it was in an undisturbed area while a sandy loam soil was only one-twentieth as permeable. Impacts from recreational users appear to level off after about 2 years (Merrian and Smith (1974), Manning (1979)). The rapid occurrence of soil compaction and ground cover deterioration, even under light use, indicates bare and disturbed ground is inevitable and is accelerated by vehicles. Vehicles use was also a major contributor to the progressive expansion of dispersed sites over time. The area currently available for motorized access for dispersed camping on 0-20% slope class is shown in Table 3-46 for sediment impaired 303(d) listed streams and for the entire planning area in Table 3-47. Camping on slope classes greater than 20% is highly improbable.

Figures 3-11 and 3-13 depict heavy use dispersed campsites with associated motorized access impacts. If dispersed camping adjacent to streams is retarding or preventing the attainment of Riparian Management Objectives (RMOs) the standards and guidelines in PACFISH, INFISH, and the Aquatic Conservation Strategy (ACS) direct that recreation practices be adjusted by such means as use limitations, traffic control devices, relocation of facilities, and site specific closures. Figures 3-12 through 3-14 depict heavy use dispersed campsites with associated motorized access impacts before and after traffic control structure placement.

There are currently 29 acres available for motorized access for dispersed camping in the Mitchell Municipal Watershed and 181 acres in the Sisters Municipal Watershed.

Figure 3-11 - Dispersed Site before traffic control measures

Figure 3-12 - Dispersed Site after traffic control measures

Figure 3-13 - Before- looking at dispersed site

Figure 3-14- After- looking at dispersed site

Wetlands/Riparian Vegetation

There are approximately 18,848 acres of wetlands identified on the Deschutes National Forest and 8,177 acres on the Ochoco National Forest outside wilderness areas, the Oregon Cascades Recreation Area, and the Lookout Mountain Management Area. Road/motorized trail delivered sediment is transported through drainages (including ephemeral) to affected wetlands. Table 3-53, displayed later in this section, shows the area within 300' of wetlands open to motorized access off designated routes where at least 85 to 90 percent of road delivered sediment originates. Since motorized access for dispersed camping ingress and egress normally do not cross or run directly down ephemeral draws and drainages sediment delivery for dispersed camping and access/egress to the site would primarily be from overland flow and was analyzed within 100 feet of streams.

Under Alternative 1, impacts to riparian areas and wetlands would continue and are expected to increase, resulting in:

- Increased numbers of user created trails within wetlands, wet meadows, and other riparian areas, causing increased compaction, loss of vegetation, & increased disturbed areas (see Figure 3-16).
- Wetland recovery would be slow or continue to deteriorate.
- Riparian vegetation would continue in a downward trend due to compaction and mud bogging (see Figure 3-15)
- Sediment deposition in the wetland

Figure 3-15 - Mud bogging in wet meadow

Figure 3-16 - User created trail across wetland

Alternatives 2 and 3

Temperature

Motorized Access off Designated Routes

Beschta, et al. (1987) found that shade functions generally occur within 100-200 feet of a stream channel. Recovery of lost shade resulting from prohibiting motorized access off designated routes would primarily be at stream crossings but Alternatives 2 and 3 would also allow the reestablishment of trees on decommissioned roads and old temporary roads and skid trails adjacent to streams. While most of the potential for shade increase occurs within 4 feet of the stream, large trees can provide shade within 100 feet of the channel. Within 100 feet of fish bearing and perennial non-fish bearing streams (Class I-III), these alternatives would prohibit motorized access off designated routes on approximately 2,720 acres (4.3 mi^2) on the Deschutes National Forest and 13,904 acres (21.7 mi^2) on the Ochoco National Forest and Grassland in areas that are currently open. Alternatives 2 and 3 would beneficially increase shading on fish bearing and non-fish bearing streams (Class I-III) over time on the two National Forests and Grassland.

Motorized Access for Dispersed Camping

As with motorized access off designated routes, most of the potential for shade increases occurs within 100 feet of fish bearing and perennial non-fish bearing streams. The area open to motorized access for dispersed camping within 100 feet of streams will be used to evaluate the difference in potential stream shading between Alternative 1 and Alternatives 2 and 3. In addition, the difference in potential shading at stream side campsites will be evaluated by comparing the miles of stream with terraces in the 0-20 percent slope band open for motorized access for dispersed camping between Alternative 1 and Alternatives 2 and 3.

Within 100 feet of Class I-III streams, motorized access for dispersed camping on the Deschutes NF would be closed on approximately 12,727 acres (19.9 mi^2). Alternatives 2 and 3 would implement riparian special provisions for motorized access for dispersed camping on the remaining 6,650 acres (10.4 mi^2) that remain open to motorized access for dispersed camping within 100 feet of a Class I-III stream which limit motorized access for dispersed camping to existing, designated or defined sites within 300’ of streams from designated open roads with a 30’ vehicle setback from streams at existing sites. On the Ochoco NF and Grassland,

motorized access to dispersed campsites would be closed on 25,765 acres (40.3 mi²) within 100 feet of Class I-III streams where it is currently open, and would implement riparian special provisions for motorized access for dispersed camping on 13,046 acres (20.4 mi²) remaining open. The special provisions for motorized access for dispersed camping would have a beneficial effect, as it would reduce expansion rates on existing dispersed sites and allow reestablishment of vegetation on portions of existing dispersed sites.

Table 3-44 indicates that about 203 miles (59%) of temperature impaired 303(d) streams that are currently open to motorized access for dispersed camping would be closed in Alternatives 2 and 3. Altogether, there would be a reduction of about 633 miles (66%) of fish bearing and perennial non-fish bearing streams open for motorized access for dispersed camping on the two Forests and Grassland (Table 3-45).

The reduction of approximately 60% of stream miles currently open for motorized access for dispersed camping within 100 feet of fish bearing and perennial non-fish bearing streams, only allowing motorized access to designated, defined, or existing dispersed campsites within 300' of streams, and the 30' setback provision from streams at existing sites would prevent the expansion and increase of campsites adjacent to perennial streams from growing to a threshold where continuity might reduce shade enough to produce measurable changes in water temperatures.

Table 3-44 - 303(d) Streams Open to Motorized Access for Dispersed Camping

Sub Basin Name	Open Motorized Alt 1 (mi.)	Open Motorized Alt2/3 (mi.)	Change Open Motorized (%)
Deschutes NF			
Little Deschutes	**51**	**5**	**-90.2%**
Lower Crooked	**0**	**0**	**0%**
Upper Deschutes	**82**	**36**	**-56.1%**
Ochoco NF/CRNG			
Lower Crooked	**32**	**25**	**-21.9%**
Lower Deschutes	**0**	**0**	**0%**
Lower John Day	**2**	**1**	**-50.0%**

Sub Basin Name	Open Motorized Alt 1 (mi.)	Open Motorized Alt2/3 (mi.)	Change Open Motorized (%)
SFk. Crooked	**48**	**17**	**-64.6%**
Trout Creek	**21**	**7**	**-66.7%**
Upper Crooked	**94**	**46**	**-51.1%**
Upper Deschutes	**0**	**0.2[1]**	**>+100%**
Upper John Day	**15**	**5**	**-66.7%**

[1] Area open for MADC would increase due to proposed changes on Crooked River National Grassland

Table 3-45 - Perennial Streams[1] Open to Motorized Access for Dispersed Camping

Sub Basin Name	Open Motorized Alt 1 (mi.)	Open Motorized Alt2/3 (mi.)	Change Open Motorized (%)
Deschutes NF			
Little Deschutes	**147**	**17**	**-88.4%**
Lower Crooked	**0**	**0**	**0%**
Upper Deschutes	**220**	**78**	**-64.6%**
Ochoco NF			
Lower Crooked	**124**	**64**	**-48.4%**

Sub Basin Name	Open Motorized Alt 1 (mi.)	Open Motorized Alt2/3 (mi.)	Change Open Motorized (%)
Lower Deschutes	**0**	**0.7[2]**	**>+100%**
Lower John Day	**27**	**9**	**-66.7%**
SFk. Crooked	**87**	**26**	**-70.1%**
Trout Creek	**29**	**8**	**-72.4%**
Upper Crooked	**248**	**114**	**-54.0%**
Upper Deschutes	**0**	**0.2[2]**	**>+100%**
Upper John Day	**84**	**16**	**-81.0%**

[1] Some perennial streams are shown in both Table 3-44 & 3-45

[2] Area open for MADC would increase due to proposed changes on Crooked River National Grassland

Vegetative recovery within riparian special provision areas is expected to be limited to the area within the special provision 30' vehicle setback from streams at existing dispersed sites with a projected decrease in size of dispersed camping sites from 0.17 acres (100' x 75') to 0.11 acres (100' x 50'). Vegetative recovery in moist riparian zones would be more rapid than in the uplands and dry terraces due to higher moisture regimes but only partial recovery is expected due to continued trampling, fire circles, and tent placement (the riparian special provision only applies to motorized access for dispersed camping). Measurable increases in stream shade would be expected to take decades. Assumed vegetative recovery rates for depaupered upland sites and dry terraces are assumed to be:

* 0-5 years – 0-10%
* 5-10 years – 10-25%
* > 10 years – up to 30%

Increases in shade from limiting OHV use to access to disperse campsites and designated trails/play areas has a very low potential to increase stream shading and would not be measurable. Increased shading resulting from limiting motorized access within 30' of streams at existing dispersed campsites has the potential to produce a measurable increase in stream shading in 10 to 20 years but due to the small area affected (see Table 3-40) and distribution of sites would not result in measurable changes in water temperature. Increases in shading are expected to affect less than 1 percent of perennial stream miles. Implementation of these alternatives would not likely result in a measurable change in water temperature as a result of prohibiting motorized access off designated routes or changing the condition of motorized access

dispersed campsites adjacent to streams. Alternative 2 and 3 would meet state water quality standards for water temperature

Sediment

Motorized Access off Designated Routes

OHV road/trail delivered sediment is transported through drainages (including ephemeral) as well as through overland flow and normally originates within 300' of the stream channel. Probably less than 10-15 percent of delivered sediment originates outside the 300' analysis buffer. The area open to motorized access off designated routes and the closed and decommissioned road densities within 300' of streams will be evaluated to compare the change in risk of sediment delivery between Alternative 1 and Alternatives 2 and 3.

Within 300' of perennial and intermittent streams (Class I-IV), Alternatives 2 and 3 would prohibit motorized access off designated routes on approximately 21,649 acres (38.9 mi²) that are currently open on the Deschutes National Forest and 98,214 acres (153.5 mi²) on the Ochoco National Forest and Grassland. Changes to motorized access off designated routes within 300' of Class I-IV streams from current condition are shown in Table 3-47 and those to sediment impaired 303(d) listed streams in Table 3-46. Changes to motorized access off designated routes in Municipal Watersheds is shown in Table 3-48.

Table 3-46 –Motorized Access off Designated Routes within 300 ft. of 303(d) Streams

Sub Basin Name	Alt1		Alt2/Alt3	
	Open (ac)	Closed (ac)	Open (ac)	Closed (ac)
Trout Creek	1974	66	0	2040
Upper Deschutes*	0	2358	0	2358

* Includes only watersheds between Wickiup Reservoir and the city of Bend

Table 3-47 –Motorized Access off Designated Routes within 300 ft. of Streams

Sub Basin Name	Alt1		Alt2/Alt3	
	Open (ac)	Closed (ac)	Open (ac)	Closed (ac)
Deschutes NF				
Little Deschutes	7050	12353	0	19403
Lower Crooked	0	0	0	0
Upper Deschutes	14644	64597	0	79241
Ochoco NF/CRNG				
Lower Crooked	17613	20440	0	38053
Lower Deschutes	0	8686	0	8686
Lower John Day	4858	2252	0	7110
S. Fork Crooked	19027	1427	0	20454
Trout Creek	5457	3949	0	9406
Upper Crooked	35921	17147	0	53068
Upper Deschutes	0	4696	0	4696
Upper John Day	15338	8387	0	23665

Table 3-48 –Motorized Access off Designated Routes within 300 ft. of Streams in Municipal Watersheds

Municipal Watershed	Alt1		Alt2/Alt3	
	Open (ac)	Closed (ac)	Open (ac)	Closed (ac)
Mitchell	110	213	0	323
Bend	0	436	0	436
Sisters	0	654	0	654

Prohibiting motorized access off designated routes would allow sediment delivery from closed roads and decommissioned system, temporary logging roads, and user created motorized trails, currently being used by OHVs, to recover toward the 75 percent reduction in sediment delivery for closed roads and 95 percent reduction for decommissioned projected by Parker and Christensen (1964). Christenson indicated this would substantially reduce erosion, but would not return it back to natural background levels. While non-system roads, temporary roads, and user created tie-through trails in the areas open to motorized access off designated routes in Alternative 1 and shown in Tables 3-46 – 3-48 are not on the Forest GIS layers and while not all closed roads are getting OHV use, Table 3-49 gives a perspective of possible reductions in sediment delivery based on potential use on up to three quarters of closed and mapped decommissioned roads (based on personal observations in the McKay Creek Watershed) under current management direction and with projected increases in recreational use.

Table 3-49 – Road Densities within 300 Ft. of Streams

Sub Basin	Alt 1 (No Action)		Alt2 & Alt3
	Open	Closed/Decom.	Open, Closed/Decom.
Ochoco NF/Crooked River National Grassland			
Lower John Day	**2.80 mi/mi²**	**2.49 mi/mi²**	**No Change**
	26 miles	**23 miles**	**“ “**
Upper John Day	**1.92 mi/mi²**	**2.75 mi/mi²**	**No Change**
	51 miles	**73 miles**	**“ “**
Lower Deschutes	**3.43 mi/mi²**	**0.28 mi/mi²**	**No Change**
	47 miles	**4 miles**	**“ “**

Sub Basin	Alt 1 (No Action)		Alt2 & Alt3
	Open	Closed/Decom.	Open, Closed/Decom.
Upper Deschutes	**1.55 mi/mi²**	**0.51 mi/mi²**	**No Change**
	11 miles	**4 miles**	**“ “**
Trout Creek	**3.43 mi/mi²**	**2.40 mi/mi²**	**No Change**
	50 miles	**35 miles**	**“ “**
Lower Crooked River	**2.88 mi/mi²**	**1.98 mi/mi²**	**No Change**
	149 miles	**103 miles**	**“ “**
Upper Crooked River	**3.77 mi/mi²**	**2.62 mi/mi²**	**No Change**
	305 miles	**212 miles**	**“ “**
Beaver/SFk Crooked	**2.25 mi/mi²**	**3.64 mi/mi²**	**No Change**
	72 miles	**116 miles**	**“ “**

Sub Basin	Alt 1 (No Action)		Alt2 & Alt3
	Open	Closed/Decom.	Open, Closed/Decom.
Deschutes NF			
Upper Deschutes	**2.68 mi/mi²**	**0.89 mi/mi²**	**No Change**
	330 miles	**109 miles**	**“ “**
Little Deschutes	**1.76 mi/mi²**	**0.36 mi/mi²**	**No Change**
	44 miles	**9 miles**	**“ “**
Lower Crooked River	**0 mi/mi²**	**0 mi/mi²**	**No Change**
	0 miles	**0 miles**	**“ “**
Summer Lake	**0 mi/mi²**	**0 mi/mi²**	**No Change**
	0 miles	**0 miles**	**“ “**
Williamson	**0 mi/mi²**	**0 mi/mi²**	**No Change**

Sub Basin	Alt 1 (No Action)		Alt2 & Alt3
	Open	Closed/Decom.	Open, Closed/Decom.
	0 miles	**0 miles**	" "

In high use areas where OHV roads/trails may exceed open road densities, the decrease in sediment delivery may be substantial (Ricker et al., 2008 and Ayala, 2005). The highest reductions in sediment load would occur at stream crossings and from trails running down intermittent and ephemeral draws.

Motorized Access Dispersed Recreation

Since motorized access for ingress and egress to dispersed campsites normally doesn't run down ephemeral draws and drainages, sediment delivery would primarily be from overland flow. The area open to motorized access to dispersed recreation sites within 100 feet of streams will be used to evaluate the change in risk for sediment delivery between Alternative 1 and Alternatives 2 and 3. The change in miles of stream terrace open for motorized access dispersed camping, in the 0-20 percent slope band, will be used to evaluate the change in risk of sediment delivery from overland flow from the actual campsite between Alternative 1 and Alternatives 2 and 3.

Within 100 feet of perennial and intermittent streams, motorized access dispersed recreation on the Deschutes National Forest would be reduced by 12,727 acres (64%) and by 25,765 acres (66%) on the Ochoco National Forest and Grassland. Approximately 6,650 acres (10.4 mi²) and 13,046 acres (20.4 mi²) would remain open for motorized access with special riparian provisions on the Deschutes and Ochoco National Forests, respectively. Changes to motorized access to dispersed camping sites within 100 feet of streams are shown in Table 3-51 and those to sediment impaired 303(d) listed streams in Table 3-50. Changes to motorized access for dispersed camping within Municipal Watersheds are shown in Table 3-51.

Table 3-50 - Motorized Access for Dispersed Camping within 100 ft. of 303(d) Streams

Sub Basin Name	Alt1		Alt2/Alt3		
	Open	Closed	Open		Closed
	(ac)	(ac)	(ac)	Change	(ac)
Trout Creek	709	25	205	-71.1%	531
Upper Deschutes*	905	409	796	-12.0%	518

* Includes only watersheds between Wickiup Reservoir & Bend

Table 3-51 - Motorized Access for Dispersed Camping within 100 ft. of Streams

Sub Basin Name	Alt1		Alt2/Alt3		
	Open	Closed	Open		Closed
	(ac)	(ac)	(ac)	Change	(ac)
Deschutes NF					
Little Deschutes	5475	1312	683	-87.5%	6103
Lower Crooked	0	0	0	0%	0
Upper Deschutes	13902	14348	5967	-57.1%	22275

Sub Basin Name	Alt1		Alt2/Alt3		
	Open	Closed	Open		Closed
	(ac)	(ac)	(ac)	Change	(ac)
Ochoco NF/CRNG					
Lower Crooked	7699	5124	2759	-64.2%	10064
Lower Deschutes	0	2913	792[1]	>+100%	2117
Lower John Day	1822	564	451	-75.2%	1937
S Fk. Crooked	6486	365	1511	-76.7%	5337
Trout Creek	1833	1324	978	-46.6%	2174
Upper Crooked	15736	2115	5441	-65.4%	12398
Upper Deschutes	0	1584	212[1]	>+100%	1370
Upper John Day	5235	9649	902	-82.8%	6988

[1] Area open for MADC would increase due to proposed changes on Crooked River National Grassland

On the Deschutes National Forest, the Municipal Watershed for the city of Bend would remain closed to motorized access for dispersed camping. The area open to motorized access for dispersed camping in the Sisters Municipal Watershed within 100 feet of streams would be reduced by 111 acres to 70 acres (61.3%) and that in the Mitchell Municipal Watershed (Ochoco National Forest) by 22 acres to 7 acres (75.9%). Since the water in the Mitchell Municipal Watershed is diverted from springs and most of the source area is in the Bridge Creek Wilderness, the reduction in acres would have a minimal impact on water quality. Sisters currently uses groundwater from wells closer to the city for domestic purposes and only maintains facilities in the municipal watershed as an emergency backup. The surface water municipal watershed has not been used for drinking water for several years. Depending on where the area open for motorized access for dispersed camping is in relation to the diversion and connectivity, motorized access dispersed camping may result in some sediment delivery at the diversion if Sisters needs to use the water system in the future.

Table 3-52 –Motorized Access for Dispersed Camping within 100 ft. of Streams in Municipal Watersheds

Municipal Watershed	Alt1		Alt2/Alt3		
	Open	Closed	Open		Closed
	(ac)	(ac)	(ac)	Change	(ac)
Mitchell	29	70	7	-75.9%	92
Bend	0	147	0	0%	147
Sisters	181	36	70	-61.3%	148

The reduction of approximately 70% of the area currently open for motorized access to dispersed camping sites within 100 feet of perennial and intermittent streams and only allowing motorized access to designated, defined, or existing dispersed campsites would prevent the expansion and increase of campsites adjacent to streams.

Decreases in sediment delivery from Alternative 1 at dispersed campsites would primarily result from the 30’ vehicle setback from streams at existing dispersed sites with a projected decrease in the size of dispersed camping sites from 0.17 acres (100’ x 75’) to 0.11 acres (100’ x 50’) and from not developing new dispersed sites close to streams. Pulling vehicles back 30’ from streams would reduce ground disturbance within the highest overland flow sediment delivery zone. This could increase ground disturbance in the relocated parking/vehicle camping area (campers & trailers) but the additional setback would result in additional settling, filtering, and infiltration before sediment could reach the water and would deliver less sediment than if vehicles were allowed to continue parking right up to the waters edge. Vegetative recovery in riparian zones would be more rapid than in the uplands due to higher moisture regimes but only partial recovery is

expected due to continued trampling, fire circles, and tent placement (the riparian special provision 30' setback at existing dispersed sites would also apply to campers and tent trailers).

Implementation of Alternative 2 and 3 would reduce the sediment load in perennial and intermittent streams (Class I-IV) on the two National Forests and Grassland. They would also result in decreases in turbidity and sediment delivery primarily during and shortly after runoff events, due to decreases in road/motorized trail delivered sediment, decreased disturbed and bare ground within 30' of streams at existing dispersed sites, and increased vegetative filtering at existing dispersed camp sites, but it would be hard to quantify due to the scattered nature of the disturbance, connectivity of streams to the disturbance, and the timing and magnitude of runoff events. However based on personal observations of the Hydrologist on heavily used OHV areas on the Ochoco National Forest, and studies by Ricker et al. (2008) and Ayala (2005), decreases in sediment delivery could be substantive in localized drainages. Decreases in sediment delivery to streams would primarily result from prohibiting motorized access off designated routes except for ingress and egress from dispersed camping sites. Alternative 2 and 3 would meet state water quality standards for turbidity.

Wetlands/Riparian Vegetation

Alternative 2 & 3 would continue to allow motorized use on all currently open roads on both Forests. Non-highway-legal vehicles would be restricted to mixed use open roads (primarily 7 digit local roads and designated 4 digit collector roads), designated motorized trails, and designated play areas (primarily rock and gravel pits). As with streams, most sediment delivery would originate within 300' of wetlands and direct impacts to wetlands from roads/trails and mud bogging would occur within this buffer. Reductions in the area open to motorized access off designated routes from Alternative 1 are shown in Table 3-53.

Table 3-53 –Motorized Access off Designated Routes within 300 ft. of Wetlands

Sub Basin Name	Alt1		Alt2/Alt3	
	Open (ac)	Closed (ac)	Open (ac)	Closed (ac)
Deschutes NF				
Little Deschutes	5815	8380	0	14195
Lower Crooked	0	0	0	0
Upper Deschutes	2430	20211	0	22641
Ochoco NF/CRNG				
Lower Crooked	1452	2703	0	4155
Lower Deschutes	0	188	0	188
Lower John Day	1096	407	0	1503
SFk. Crooked	151	54	0	205
Trout Creek	68	24	0	92
Upper Crooked	4490	3610	0	8100
Upper Deschutes	0	52	0	52
Upper John Day	2517	821	0	3338

These alternatives would also continue to allow motorized access within 300' of most open roads for dispersed camping. However motorized access would only be allowed for ingress and egress to campsites. Within 300' of wetlands, they would limit motorized access to only existing, designated, or defined sites, and would not allow motorized access closer than 30' to the wetlands at existing dispersed sites. Most direct and indirect impacts associated with dispersed campsites and access would result from activities within 100 feet of the wetland. Within this 100 feet, motorized access to dispersed camp sites on the Deschutes National Forest would be reduced by 16,425 acres (81%) and by 6,025 acres (68%) on the Ochoco National

Forest. Approximately 3,869 acres (6.0 mi²) and 2,828 acres (4.4 mi²) would remain open for motorized access with special riparian provisions on the Deschutes, and Ochoco, respectively (see Table 3-54).

Table 3-54 –Motorized Access for Dispersed Camping within 100 ft. of Wetlands

Sub Basin Name	Alt1		Alt2/Alt3		
	Open	Closed	Open		Closed
	(ac)	(ac)	(ac)	Change	(ac)
Deschutes NF					
Little Deschutes	11113	1554	1456	-86.9%	11211
Lower Crooked	0	0	0	0%	0
Upper Deschutes	9181	9812	2413	-73.7%	16580
Ochoco NF/CRNG					
Lower Crooked	1855	985	847	-54.3%	1996
Lower Deschutes	0	172	24	> +100%	149
Lower John Day	835	148	217	-74.6%	766
SFk. Crooked	105	42	13	-87.6%	135
Trout Creek	43	27	11	-74.4%	59
Upper Crooked	4222	1684	1403	-66.8%	4508
Upper Deschutes	0	35	10	> +100%	25
Upper John Day	1793	473	303	-83.1%	1964

Restrictions on motorized access for dispersed camping in these alternatives would substantially reduce recreation-associated impacts to wetlands. Most campers set their campsites on dry ground. However, many of the wetlands on the two Forests are only seasonally saturated and are dry in the late summer or in the fall during hunting season. Compaction, vegetation shifts to more use tolerant species, and bare ground associated with access and the camp site would probably persist in these seasonally dry areas. In areas where the public can readily identify the wetland, implementation of the 30' vehicle setback at existing dispersed sites would allow for riparian vegetation recovery.

With implementation of Alternative 2 or 3, wetlands currently adversely impacted by motorized use would be expected to recover over time. That being said, wetland function at most sites would not be expected to fully recover and some level of erosion and sediment delivery would persist, but recovery rates would be higher than upland sites due to greater vegetative productivity and associated biopedoturbation from worms, insects, and other fauna. From observations of measures taken to restore severely impacted wetlands resulting from OHV use on the Ochoco National Forest, vegetation recovery would be fairly rapid. However subsurface flow and wetland drainage due to puddling (severe rutting) would take longer to recover and may continue in a downward trend without mechanical treatment. The level of sediment delivery would be small and these alternatives and restrictions on OHV operation within wetlands would be consistent with Executive Order 11990.

Geology and Minerals

Executive Summary

This section summarizes the analysis of the effects on important geological attributes within the analysis area that could be affected by the proposed action.

There is no appreciable difference of potential effects for geology and minerals between Alternatives 2 and 3 for the forests and grassland.

For locatable minerals and rockhounding, the proposed action would not change use of the mining claims. Access would still be granted through the plan of operations, if the activity requires motorized access off designated routes.

For leasable minerals, there would be no change in operations with this proposed action for either the Deschutes National Forest or the Ochoco National Forest and Grassland. Some lease areas currently prohibit public motorized access.

For saleable minerals,if the source is not currently closed to the public, then Alternatives 2 and 3 would affect access by the public to use the sources for other activities, following the proposed closures.

In Alternatives 2 & 3, the proposed 30' setback for motorized access for dispersed camping for protection of wetlands, seeps, springs and stream edges would have a beneficial effect by allowing vegetation recovery, which would increase evapotranspiration, thereby increasing slope stability for those dispersed campsites with motorized access on dormant landslide terrain and adjacent to streams. Maintaining the minimum 30' buffer from the wetland edge for motorized access for dispersed camping would also beneficially reduce the potential risk for groundwater contamination. Alternatives 2 and 3, over the No Action Alternative, would provide greater protection for both forests by restricting camping to defined, designated and existing sites and enforcement of the 30' buffer from wetlands, seeps, springs and stream edges to motorized access for dispersed campsites.

Affected Environment

This section will characterize the important geological attributes within the analysis area that could be affected by the proposed action. These include: dormant and active landslide terrain, including those close to 303(d) listed streams; geologic faults that may be coincident with motorized access to dispersed camping; surface/groundwater connections through permeable rocks; leasable, locatable and salable minerals.

The Deschutes National Forest, the Ochoco National Forest and the Crooked River National Grassland are primarily underlain by volcanic materials with varying levels of permeability. The Ochoco National Forest has a fair amount of dormant and active landslide terrain, while the Deschutes has a minor amount. The Deschutes has a large amount of very permeable rock with the potential for groundwater contamination across the uplands and wetlands. The mineral material sources identified in the proposed action to be designated open to motorized access off designated routes for both forests and the grassland are all actively used for mineral extraction.

This report analyzed 1,613,026 acres on the Deschutes National Forest, 613,847 acres on the Ochoco National Forest, and 112,048 acres on the Crooked River National Grassland. The two Forests and Grassland are primarily underlain by volcanic rocks of a variety of ages (Walker and MacLeod, 1991) (Appendix B-2 Geology). The older volcanic terrain (40 Ma (Million Years) to 17 Ma), underlying the Ochoco National Forest, is composed of basalts, rhyolites and andesites, weathering to clays. Water doesn't tend to infiltrate easily in the clays, resulting in low permeability (Gonthier, 1985). The younger volcanic units (less than 17 Ma) underlying the Crooked River National Grassland and Deschutes National Forest exhibit more porous characteristics, allowing more surface/groundwater flow connections (Lite and Gannett, 2002). The younger lithology on the Deschutes National Forest is dominated by thick blankets of cinder, pumice and very open fractured basalt flows which easily pass surface water to ground water. The crest of the Cascades experienced alpine glaciation which deposited thick blankets of moderate to highly permeable glacial gravels.

The Deschutes National Forest has experienced significant glacial events, the most recent was 20,000 years ago, eroding the large volcanoes and depositing blankets of glacial till along the toe slopes of the Cascades. These glacial gravels are sensitive to disturbance and are permeable, connecting surface water and

groundwater. The Ochoco Mountains were not glaciated, although the area did experience periglacial effects.

Mount Mazama ashfall can be found on the northern slopes across the Ochoco Mountains and southern Deschutes River basin. The ash was deposited approximately 7,700 years ago, following the eruption of Mt. Mazama, subsequently reworked by wind and water. The ash capping the Ochoco Mountains is weathering to clay. The axis of the ashfall runs from Crater Lake (Mt. Mazama) to Lewiston, Idaho (Walker and MacLeod, 1991). The 1½ feet of sand-sized ash has mixed with the developing soils, creating more erosive soils. These soils provide the majority of the natural stream sediment due to processes like sheet and rill erosion. Ashfall has collected in the draws in the Ochoco Mountains, increasing the fertility of the drainages and allowing development of the tree/shrub component of the vegetation in an otherwise thin soil bedrock dominated terrain.

In addition to ash from Mount Mazama, the Deschutes National Forest and Crooked River National Grassland received a variety of more recent ashfall from different vents (Newberry volcano and others) that have deposited coarser pumice, which has a different character. On the lower east slope flanks of the Cascades and across the highlands, containing Newberry volcano, coarse ash/pumice fragments, primarily from Mt. Mazama and Newberry volcano, carpet the older terrain to depths of 3 to 6 feet. The coarser porous pumice blanket covers the older terrain upon which drainage had developed.

There is little surface water exposed on the south to southeast end of the Deschutes National Forest because of the pumice blanket. However, the pumice breaks down and is easily disturbed, forming large volumes of dust. The unconfined pumice aquifer is permeable, connecting the surface water to groundwater.

The inherent weathering characteristics of the rock speak to the durability over time. The higher resistance to chemical and mechanical weathering processes indicates bedrock that breaks down into coarse rock fragments, boulders, gravels. The intermediate range exhibits breakdown products of the boulders, gravel, sand and silt size with clays. The lithology highly susceptible to weathering processes are those units that are already unconsolidated mixtures of sand, silt, gravel, clays which are easily dislodged and transported either by wind, water or mechanical means (earthquakes, landslides or human interaction). Unconsolidated rock units like glacial till, landslide terrain, alluvium and pumice blankets, by nature, are already finer particles which have more surface area exposed to percolating waters.

On the Deschutes National Forest, fifty-nine (59%) percent of the underlying formations within the analysis area are predominantly resistant to chemical and mechanical weathering processes, 0.7 percent have an intermediate susceptibility to chemical and mechanical weathering processes and 38.6 percent are highly susceptible to mechanical and chemical weathering processes (Appendix B-2 Geology) with 1.7 percent of the area under water.

On the Ochoco National Forest, fifty-eight (58%) percent of the underlying formations within the analysis area are predominantly resistant to chemical and mechanical weathering processes, 36 percent have an intermediate susceptibility to chemical and mechanical weathering processes and 6 percent are highly susceptible to mechanical and chemical weathering processes with less than 0.04 percent under water.

On the Crooked River National Grassland, thirty (30%) percent of the underlying formations within the analysis area are predominantly resistant to chemical and mechanical weathering processes, 66 percent have an intermediate susceptibility to chemical and mechanical weathering processes and 4 percent are highly susceptible to mechanical and chemical weathering processes with less than 0.4 percent under water.

In general, the central Oregon area volcanic rocks are durable with a range of 30%-59% percent being relatively resistant to chemical and mechanical weathering processes. The Deschutes National Forest tends

to have more lithologic units highly susceptible to chemical and mechanical weathering, followed by the Ochoco National Forest, then the Grassland.

Faults and Landslides

In central Oregon, the development of the scenic cliffs and prominent escarpments are due to a variety of processes: volcanism, faults, folds, landslides and alpine glaciation. The north rim of the Ochoco Mountains rose with the Blue Mountain Anticline (folded rocks) (Walker, 1990). The related tectonic fault traces have influenced the development of drainage patterns. The mass wasting processes, active in central Oregon, includes the formation of talus slopes, deep seated dormant landslides, slope creep and rock topple. The wet areas (seeps and springs) adjacent to dormant landslides and tectonic faults identify interrupted drainage flow. These wet areas show up as springs and seeps.

During the past 10,000 years, large rotational landslides have developed across the Ochoco Mountains. When the groundwater flow is modified, pockets of these landslides reactivate at times. The Deschutes National Forest has seen the development of a few large landslides, specifically on Green Ridge, along the Metolius River.

Faults

The fault derived fractures in the basalt are areas of concentration for groundwater infiltration. The faults, a reflection of tectonic movement, provide avenues for collection of soil and ash which makes a more fertile growing environment. The faults may be characterized by " stringers", areas with concentrations of tree and shrub components. Numerous springs occur along the fault lineations, representing ground/surface water connections. The faults and folds in the Ochoco Mountains are generally 10 million year old features. The Green Ridge Fault on the Deschutes National Forest was most recently active about 750,000 years ago. The Northwest Rift Zone (passes through Newberry Volcano and Lava Butte) was active around 7,000 years ago.

Landslides

The Deschutes National Forest has one dormant landslide (approximately 357 acres), which had a small segment reactivate. For the Deschutes National Forest, this is less than 0.1 percent of the analysis area and occurs on Greenridge in the Metolius Basin. This slide area near Forest Road 1499 reactivated following the 1996 rain-on-snow event by releasing a debris flow which gullied out a draw and then deposited debris on the lower older toeslope, close to the Metolius River. Approximately 2-3 acres within the dormant landslide reactivated during the weather event.

The Ochoco National Forest has the most landslide prone areas of the two National Forests, with 1,001 identified dormant landslides (approx. 87,199 acres) and 50 active landslides covering 62 acres. The Grassland has 14 dormant landslides on 1,371 acres. For the Ochoco and Grassland, this is 21 percent of the analysis area (88,632 acres).

Transportation networks (trails and roads) cross the dormant and active landslide terrain. Motorized access to dispersed campsites are located on the terrain, generally adjacent to streams, on the toeslopes of the landslides. When the toeslopes are streambanks, they are prone to active erosion. The material is intermittently unstable.

The active landslides are in isolated drainages, generally not suitable for motorized access to dispersed camping, with the exception of Doe Creek, on the Ochoco National Forest. The site, less than one acre in

size, is on a landslide bench, well above the creek. When the dormant landslides were more active, they contributed a portion of the existing sediment currently occupying the flood plains of the stream courses. Motorized access for dispersed camping occurs on the dormant landslide terrain, on midslope benches and on the toeslopes adjacent to creeks on both the Forest and Grassland.

The landslide debris and Mazama ash contribute to the fine sediments present in the stream substrate on both forests. Higher risk for destabilization of the streambanks along dormant landslide terrain (sediment source) is associated with those streams on the 303(d) list for temperature (see the hydrology section). When the toeslopes of the landslides confine streams, they are prone to active erosion. The landslide debris has reached equilibrium on the hill slopes. As the stream erodes the toeslopes, this equilibrium is upset. Accelerated erosion into the streams from the banks is associated with the landslide areas.

The Deschutes National Forest does not have any dormant or active landslide terrain on 303 (d) listed streams. On the Ochoco National Forest and Crooked River National Grassland, there are 51.5 miles of Class I-III 303(d) listed streams adjacent to dormant and active landslide terrain. This represents 16% of the total miles of 303(d) listed stream (325.19 miles). The total stream length for all classes is 2,522 miles. The dormant landslides naturally adjust as the streams cut the toes of the landslide debris and as natural fires, insect and disease infestations remove vegetation, allowing increased precipitation to saturate the soils.

Past construction of roads across landslide debris has potentially compacted the debris, creating a dam-like feature which can collect water upslope, increasing pore water pressure to the point of failure. When the unconsolidated landslide debris is saturated, there is a potential for movement with subsurface water flow down slope.

Highly Permeable Rock

The Cascades and Ochoco Mountains are a recharge area for local groundwater aquifers. On the vegetation, lineation's mark cooling fractures and tectonic fault structures in the Picture Gorge Basalts in the Ochoco Mountains . The vegetation marks surface zones of groundwater recharge. The older Clarno Formation has low permeability (Gonthier, 1985) as does the younger John Day Formation (Lite and Gannett, 2002).

On the Deschutes National Forest, the high percentage of permeable young lava flows and porous cinders/pumice (622,609 acres or 38.6%) are at an increased risk for hazardous spills directly affecting groundwater (Appendix B-2 Geology). The Ochoco National Forest and Grassland are at less of a risk (41,753 acres or 5.8%) for potential groundwater contamination. The spills could be both biological and petroleum based. Vehicles changing oil, or being fueled, emptying RV black water septic tanks or grey water on these formations has the potential for introducing contaminants into the groundwater, especially if the location is adjacent to wetlands, springs or streams. The young lavas provide a direct link between surface and groundwater (Lite and Gannett, 2002). Forest Service brochures instruct forest users about how to avoid contaminating water sources while recreating.

Minerals

For the purposes of this report, minerals will be classified in three categories: leasable, locatable and salable.

Leasable Minerals -Leasable minerals include geothermal, oil and gas, defined in 36 CFR 228B. The Oregon Department of Geology and Mineral Industries has classified the Deschutes and Ochoco National Forests as favorable for the discovery of geothermal resources (Tout, 1989). Over the past 15 years, geothermal exploration has occurred sporadically in the vicinity of Newberry volcano. Ninety-six percent of

the Ochoco National Forest and Crooked River National Grassland has been classified as prospectively valuable for oil and gas (Forest Plan, 1989).

There are currently 54,000 acres under geothermal lease, of which a portion are under an active exploration operation administered by the BLM. The Crooked River National Grassland has 10,363 acres under oil and gas lease but no active operations. There will be no change in operations with this proposed action for either the Deschutes or the Grassland. Some lease areas prohibit public motorized access currently.

Locatable Minerals - Locatable minerals, such as gold, mercury and thundereggs, are present within the boundary of the Ochoco National Forest (as defined in 36 CFR 228A). The Deschutes National Forest does not have the geologic conditions to support the presence of gold or mercury but there is opal present. According to the December 10, 2008 BLM mining claim recordation report, there are a number of mining claims recorded in the analysis area on the Ochoco National Forest and 2 mining claims on the Deschutes National Forest. The proposed action would not change use of the mining claims. Access would still be granted through the plan of operations, if the activity requires motorized access off designated routes.

Rockhounding is a popular family activity on both forests. Over the years, rockhounding has occurred primarily on the Ochoco National Forest and the Crooked River National Grassland. There are three frequently used sites on the Ochoco National Forest: White Fir, Whistler and Maury Agate Beds. There are other areas also noted for agate and thundereggs. The proposed action would not change access to the rockhound sites. The more frequented sites are all on open roads.

Salable Minerals - Salable mineral materials include cinders, gravel or rock suitable for crushing or landscape use, as defined in 36 CFR 228C. These mineral material sources are located across the two forests and grassland and are primarily basalt, andesite and rhyolite. They were developed over the past four decades primarily to support the National Forest system roads. The majority of the material removed from these areas continues to be for County, State or Federal use. The temporarily inactive to active rock sources range from pit run to crushing quality. The majority of the mineral material extracted is used for landscape rock, road reconstruction, fisheries, riparian and wildlife projects.

The mineral material sources are also popular areas for other uses that are not related to mineral extraction such as OHV ‘play’ areas, rock crawling and steep slope challenges, group campsites, snowparks and target shooting to name a few. Currently, most mineral material sources on the two Forests are open to motorized use unless they have been closed with a gate for rock crushing or when other mineral extraction activities are active and pose a public safety hazard. Some of the mineral material sources, through low use, are reclaiming naturally.

The two forests and the grassland have mineral material sources in a various stages of development. Some are in active use, some are closed and reclaiming naturally, some haven’t been used recently and are temporarily inactive. On the Deschutes National Forest, under the no action alternative, included in the 200 material sources (778 acres) (0.05 percent of the forest land base) inventoried, there are four mineral material sources open for motorized access on designated OHV trail system routes. These four material sources, on the Bend-Ft. Rock district, are part of the East Fort Rock OHV trail system: South Cinder Cone Cinder Pit (3030), Ice Rock Quarry (3105), Sabol Butte Cinder Pit (3041) and Ground Hog Rock Quarry (3098). They contain 1.86 acres, 17.12 acres, 5.3 acres and 16.34 acres, respectively. Ground Hog Rock Quarry is currently a designated rock crawl area for high clearance vehicles. As described in the Affected Environment, except for those included in these designated systems, most of these pits are within areas that generally do not prohibit motorized access off designated routes. In the designated motorized trail systems, conditions for use of the open areas are included in the regulations applied to the entire trail system. On the Ochoco National Forest and Crooked River National Grassland, of the 331 material sources (628 acres)

(0.10 percent of the forest land base) inventoried, there is only 1 mineral material source currently dedicated as open for motorized access as part of a designated system. Canal Material Source has been incorporated into the Henderson Flat OHV Management Area.

Free use permits to the State of Oregon and the counties account for the majority of the large volumes extracted on each forest. The proponents vary from year to year but the use is fairly consistent (Table 3-55). The Deschutes National Forest averages 412,361 tons extracted per year at a value of $264,705. The Ochoco National Forest/Crooked River National Grassland has an average use of 57,597 tons/year at a value of $ 23,224, based on fair market value. These volumes include rock hauled for on-forest projects. Rock purchased from commercial sources located off forest is also used on projects within the national forests. The National Forest material sources are located in a variety of management areas.

Table 3-55: Mineral Material Use for Deschutes National Forest, Ochoco National Forest and Crooked River National Grassland

Year	Deschutes NF Weight (tons)	Deschutes NF Value	Ochoco NF/CRNG Weight (tons)	Ochoco NF/CRNG Value
2006	80,934	$81,265	12,766	$4,555
2007	426,823	$226,145	150,492	$58,292
2008	729,327	$486,705	9,534	$6,826
Total	**1,237,084**	**$794,115**	**172,792**	**$69,673**
Average Weight or income/year	**412,361 tons/yr**	**$264,705/yr**	**57,597 tons/yr**	**$23,224/yr**

Access to and use of the mineral materials within these sources is subject to permit conditions, and would not be affected by this decision. However, if the source is not currently closed to the public, then Alternatives 2 and 3 would affect access by the public to use the sources for other activities, following the proposed closures.

Analysis of Environmental Effects

Alternative 1

Active and Dormant Landslide Terrain

Motorized Access off Designated Routes and Motorized Access for Dispersed Camping

Alternative 1 (No Action) would not eliminate any presently allowed motorized access off designated routes or motorized access for dispersed camping. Patterns of movement of active and dormant landslide terrain would continue to be mainly influenced by the natural process of erosion under the current precipitation pattern and the current patterns and trends from recreation use.

The majority of the dormant and the active landslide terrain is located on the Ochoco National Forest and Crooked River National Grassland (Table 3-56 and 3-57). Landslide terrain tends to develop unusual subsurface drainage patterns. The intensity and style of management activity on landslide terrain, in the vicinity of seeps and springs, could potentially change the drainage pattern which increases the risk for instability. Of the alternatives, Alternative 1 has the most potential to adversely affect landslide terrain.

Table 3-56: Percent Effected Dormant Landslide terrain within all the alternatives (acres).

Motorized Access for Dispersed Camping	Total Forest Acres	Alternative 1 – No Action - Acres	Alternative 2 – Proposed Action - Acres	Alternative 3 - Acres
Deschutes NF	357			
Existing open to motorized access for dispersed camping		214		
Continued existing open to motorized access for dispersed camping			11	
Proposed open to motorized access for dispersed camping			10	
Proposed open to motorized access for dispersed camping, with special provisions – non-riparian & riparian			67	88
Total Dormant Landslide Acres – Deschutes NF (1,612,991 acres)	**357 acres (0.02%)**	**214 acres 0.01%**	**88 acres 0.01%**	**88 acres 0.01%**
Ochoco NF	88,568			
Existing Open Year round & seasonally to motorized access for dispersed camping		64,398		
Continued Existing open to motorized access for dispersed camping, year round and seasonally			7,902	
Proposed open to motorized access for dispersed camping,with special provisions – non-riparian & riparian			4,281	10,536
Proposed open to motorized access for dispersed camping, seasonally w/ special provisions – non-riparian and riparian			693	2,352
Total Dormant Landslide Acres – Ochoco NF (613,833 acres)	**88,568 acres (14.4%)**	**64,398 acres 10.5%**	**12,876 acres 2.1%**	**12,876 acres 2.1%**
Crooked River NG	1,371			
Proposed Open Year Round to motorized access for dispersed camping			73	
Proposed open to motorized access for dispersed camping, seasonally w/ special provisions – non-			13	13

Motorized Access for Dispersed Camping	Total Forest Acres	Alternative 1 – No Action - Acres	Alternative 2 – Proposed Action - Acres	Alternative 3 - Acres
riparian				
Proposed open to motorized access for dispersed camping,with special provisions – non-riparian and riparian			169	242
Total Dormant Landslide Acres – CRNG (110,071 acres)	**1,371 acres (1.3%)**	**0 acres**	**255 Acres 0.23%**	**255 acres 0.23%**

Table 3-57: Active Landslide terrain within acres open for dispersed campsites

Dispersed Campsites	Total Forest Acres	Alternative 1 – No Action - Acres	Alternative 2 – Proposed Action - Acres	Alternative 3 - Acres
Deschutes NF	2-3	2-3	2-3	2-3
Total Active Landslide acres – Deschutes NF (1,612,991 acres)	2-3 (<0.0002%)			
Ochoco NF	62			
Existing Open Year round and seasonally to motorized access for dispersed camping		46		
Proposed Open Year Round and seasonally			6.5	
Proposed open to motorized access for dispersed camping, seasonally w/ special provisions – non-riparian and riparian			5.9	2.1
Proposed open to motorized access for dispersed camping,with special provisions – non-riparian and riparian			0.01 acres	10.3 acres
Total Active Landslide acres – Ochoco NF (613,833 acres)	**62 acres (0.01%)**	**46 acres (0.01%)**	**12.4 acres (<0.01%)**	**12.4 acres (<0.01%)**

Highly Permeable Rock

Motorized Access for Dispersed Camping

On the Deschutes National Forest, the high percentage of permeable young lava flows and porous cinders/pumice (622,609 acres or 38.6%) are at an increased risk for hazardous spills from motorized vehicles directly effecting groundwater. Under Alternative 1, 406,345 acres (25%) would remain open to motorized access for dispersed camping (Table 3-58) and susceptible to adverse effects.

On the Ochoco National Forest and Crooked River National Grassland, under Alternative 1, 31,986 acres (4%) would remain open to motorized access for dispersed camping (Table 3-58).

Table 3-58 Permeable rocks (acres) open to motorized access for dispersed camping on the Deschutes National Forest, Ochoco National Forest and Crooked River National Grassland

Forest	Alternative 1- No Action (acres)	Alternative 2 – Proposed Action (acres)	Alternative 3 (acres)
Deschutes National Forest (1,612,991 acres)			
Existing Open Year round and seasonally to motorized access for dispersed camping and designated sites	460,345		
Continued Existing open year round and seasonally to motorized access for dispersed camping and designated sites		129,758	8,438
Proposed open year round and seasonally to motorized access for dispersed camping		12,827	
Proposed open to motorized access for dispersed camping, seasonally w/ special provisions – non-riparian and riparian		2,109	14,394
Proposed open to motorized access for dispersed camping,with special provisions – non-riparian and riparian		15,648	137,510
Deschutes TOTAL	**460,345 acres**	**160,342 acres**	**160,342 acres**
Ochoco NF and Crooked River NG (723,904 acres)			
Existing Open Year round and seasonally to motorized access for dispersed camping	31,986		

Forest	Alternative 1- No Action (acres)	Alternative 2 – Proposed Action (acres)	Alternative 3 (acres)
Deschutes National Forest (1,612,991 acres)			
Continued Existing open year round and seasonally to motorized access for dispersed camping		3,781	
Proposed open to motorized access for dispersed camping		261	
Proposed open to motorized access for dispersed camping, seasonally w/ special provisions – non-riparian and riparian		663	1,513
Proposed open to motorized access for dispersed camping,with special provisions – non-riparian and riparian		2,591	5,783
Ochoco NF and CRNG TOTALS (acres)	**31,986 acres**	**7,296 acres**	**7,296 acres**

Salable Minerals

Motorized access off designated routes and motorized access for dispersed camping would have no effect on the usefulness of a mineral material source for commercial or private uses, which would be issued under permit. The permits include measures to reduce potential introduction of invasive plants, require appropriate fire precautions and extraction parameters. The Deschutes and Ochoco National Forests and Grassland have identified sources that would remain open for OHV, dispersed camping and other recreation use, in addition to providing aggregate for permits and projects (See Table 3-59).

Table 3-59. Acres and Number of Mineral Material Sources by Forest by Alternative.

Forest	Alternative 1 - No Action # Open Material Sources/Acres	Alternative 2 – Proposed Action # Open Material Sources/Acres	Alternative 3 # Open Material Sources/Acres
Deschutes NF – 1,612,991 acres	**200** Material Sources on **778 acres(0.05%)**	**30** Material Sources on **160Acres (0.01%)**	**30** Material Sources on **160Acres (0.01%)**
Ochoco NF – 613,833 acres	**313** Material Sources on **523 Acres (0.09%)**	**20** Material Sources on **129.5 Acres (0.02%)**	**20** Material Sources on **129.5 Acres (0.02%)**
Crooked River NG – 110,071 acres	**18** Material Sources on **105 Acres (0.1%)**	**2** Material Sources on **61.5 Acres (0.01%)**	**2** Material Sources on **61.5 Acres (0.01%)**

Alternatives 2 and 3

Motorized Access off Designated Routes

There would be no effect from any of the action alternatives on the geologic resource because motorized access off designated routes would be prohibited. The remaining designated routes, through past engineering design, have had drainage and location factored in, generally reducing impacts on dormant landslide terrain. Those areas where highly porous rocks are crossed have had drainage addressed. There will be no effect on the uses of mineral material sources because the rock is extracted under a permit or part of a long term management plan for internal use.

Active and Dormant Landslide Terrain

For the active landslide terrain (See Table 3-X (3)) under Affected Environment), the only drainage likely to have dispersed camping would be on Doe Creek on the Ochoco National Forest. The rest of the active landslide acres are in areas not likely to see dispersed camping due to steep slopes. It's unlikely that vehicle compaction would have an effect on the active landslide terrain for either forest.

For the dormant landslide terrain (See Table 3-56), the 30' setback from wetlands, springs and stream banks would beneficially keep the risk low for reactivating dormant landslide terrain.

On the Ochoco National Forest, the effects of the motorized access to dispersed camps located on the dormant landslide/ 303(d) stream banks won't have a different potential for reactivating the landslide debris than if located on non-303(d) streams (See Table 3-60). The sensitivity of the streams has been established as at risk for various characteristics like temperature, dissolved oxygen or sediment. Any additional sediment added to an already compromised stream system has the potential to further compromise the stream's health. Sections of 303 (d) listed streams adjacent to dormant landslide terrain are adjacent to a larger mass of unconsolidated material.

The Deschutes National Forest and Crooked River National Grassland do not have any 303(d) listed streams crossing dormant landslide terrain in either Alternatives 2 or 3. On the Grassland there is dormant landslide terrain located along a 303(d) listed stream within areas currently closed to motorized access that would not be affected by this decision. Under both action alternatives, the 14.27 miles of 303(d) stream on dormant landslide terrain on the Ochoco NF could be impacted (Table 3-60). With the 30' no motorized access zone adjacent to stream banks and wetlands, both alternatives would be beneficial over Alternative 1. There is no difference between Alternative 2 and Alternative 3 for the dormant landslide area adjacent to 303(d) listed streams.

Table 3-60 - Miles of 303(d) listed streams on dormant landslide terrain on the Ochoco NF and Crooked River National Grassland

Ochoco NF and Crooked River NG	Alternative 1 – No Action (Miles)	Alternative 2 Proposed Action (Miles)	Alternative 3 – Special Provisions (Miles)
Existing Closed to Motorized Access	3.21	2.67	
Existing Closed to motorized access for dispersed camping	3.15	3.15	
Existing Open to motorized access for Dispersed Camping, year round and	33.9	0.09	

Ochoco NF and Crooked River NG	Alternative 1 – No Action (Miles)	Alternative 2 Proposed Action (Miles)	Alternative 3 – Special Provisions (Miles)
seasonally			
Proposed open to motorized access for dispersed camping seasonally, with special provisions, riparian		3.2	3.2
Proposed open to motorized access for dispersed camping with special provisions, riparian		10.98	10.98
Proposed closed to motorized access for Dispersed camping		20.13	
Totals	**6.36 miles closed/33.86 miles open**	**25.95 miles closed/14.27 mi open**	**14.27 miles open**

Out of a total 2,522 miles of stream (all classes) on the Ochoco National Forest and Grassland, there are 325.19 miles of 303(d) listed streams. Currently, there are 33.86 miles (10%) of the 325.19 miles of 303(d) streams located on dormant landslide terrain open to motorized access for dispersed camping. Under the Action alternatives, 14.27 miles (4.4%) of the 325.19 miles are on dormant landslide terrain open to motorized access for dispersed camping. When viewed over the total stream miles, less than 0.6% of the total stream miles on dormant landslide terrain would be open for motorized access for dispersed camping.

Streamside stabilization has the ability to decrease the effect of other activities on the natural pace of landforming processes. In Alternatives 2 and 3, provisions for a 30' setback from waterbodies would have a beneficial effect by reducing potential sediment sources within the stream systems and on the upper slopes, which would help to improve water quality. Maintaining riparian habitat conservation areas along the stream channels would reduce the risk associated with reactivating dormant landslides and reduce stream bank erosion. This would prevent removal of the toe slopes of dormant landslides located on the stream banks, which upsets the natural equilibrium of the hillside and has the capability of becoming a sediment source.

Although the risk is low for reactivating the dormant landslide terrain and the effected stream length is a small percentage of the total stream miles, the 30' setback would protect and maintain streamside vegetation which would have a beneficial effect by helping to protect the slightly more sensitive dormant landslide toeslopes adjacent to 303(d) listed streams where there is motorized access to dispersed campsites.

The dormant and active areas are at low risk for reactivation by recreation activities such as vehicle impacts adjacent to stream banks located on toeslopes of landslide terrain, as long as the bank stability is maintained. The potential for movement being initiated is more likely to come from an extreme weather event, like a rain-on-snow or focused thunderstorm.

Highly Permeable Rock

Motorized access off designated routes and Motorized access for dispersed camping

Alternative 2 and 3 would protect the groundwater from potential contamination in the areas with porous rocks that also have concentrated vehicle use such as areas with heavy motorized use off designated routes or where there is motorized access to dispersed campsites.

On the Deschutes National Forest, approximately 622,609 acres (38.6%) of the lithology has a high permeability. Alternatives 2 and 3 would allow for motorized access for dispersed camping on 160,342 acres (9.9%). On the Ochoco National Forest, approximately 41,753 acres (5.7%) of the lithology has a high permeability. Alternative 2 and Alternative 3 would allow motorized access for dispersed camping on 7,296 acres (1%).

For Alternatives 2 and 3, maintaining the minimum 30' setback from the wetland edge for motorized access would help reduce the potential risk for groundwater contamination associated with highly permeable rock. Alternative 2 and 3 would provide greater protection than Alternative 1 for both forests by restricting camping to existing, designated, or defined sites and maintaining the 30' buffer from wetland, seeps, springs and stream edges for motorized access.

Salable Minerals

Access to and use of the mineral materials within material sources is subject to permit conditions, and would not be affected by this decision. However, if the source is not currently closed to the public, then Alternatives 2 and 3 would affect access by the public to use the sources for other activities, following the proposed closures (see Chapter 2 for a summary of these closures).

Alternative 2 and 3 would have a beneficial effect by reducing the number of mineral material sources available for motorized recreation use, thus reducing the potential of these sources, if containing weed populations, of being a weed source for mechanical vectors from recreation or other non-mineral uses. Mineral Material source sites may be closed due to invasive plants until these plants can be controlled. Invasive plant specialists will make this determination based on the invasive plant species and the location and extent of the infestation.

These requirements could reduce the actual number of mineral material sources that are used for joint recreation and mineral uses. Keeping the spread of invasive species minimized helps reduce costs to projects because the mineral material would be available locally, with a shorter haul.

Reducing the number of active mineral material sources available for motorized recreation use could have an indirect beneficial effect of reducing the chances for user conflicts, and potential safety issues.

There is no difference between Alternative 2 and Alternative 3, since the same number of material sources and acres would be available for mineral extraction.

On Deschutes National Forest, 10 material sources on Bend/Ft. Rock, 10 sources on the Crescent and 10 material sources on the Sisters Ranger Districts would remain open to motorized access off designated routes and to motorized access for dispersed camping, total of 30 material sources. Of the 778 acres currently developed for mineral material, about 160 acres, or 21%, would remain open for motorized travel off designated routes.

On the Ochoco National Forest and Grassland, a total of 22 mineral material sources would remain open to motorized access off designated routes and to motorized access for dispersed camping. Two material sources on the Crooked River National Grassland, 11 sources on Lookout Mountain District and 9 sources on Paulina District material sources would remain open to motorized access off designated routes and to motorized access for dispersed camping, covering about 191 acres. Of the 628 acres currently developed for mineral material, 30% would remain open for motorized travel off designated routes for all classes of vehicles unless otherwise designated through subsequent decisions for both alternatives.

The criteria used to determine which mineral material sources would be closed to motorized access varied across the two forests and grassland. On the Deschutes National Forest, 79 sources were closed for no known OHV use, 52 for no open road access, 15 for currently closed by gates/berms or a signed closure order, 9 due to reclamation, 2 for small size, 41 for no definable boundaries, 12 for adjacency to private

property, 3 for safety, 2 for special use permits with the Federal Highway projects, 16 for invasive species, 6 for being within Newberry National Volcanic Monument, 5 by dedicated use to mineral material source extraction and 6 through other Travel Closure Areas.

On the Ochoco National Forest , 5 sources were closed for no known OHV use, 39 for no open road access, 6 were closed by gates/berms or a signed closure order, 31 due to reclamation, 192 for small size, 2 for no definable boundaries, 1 for adjacency to wilderness, 2 for adjacency to private and/or State property, 21 for invasive species, and 11 by dedicated use to mineral material source.

On the Grassland, 1 source was closed for no open road access, 3 are currently closed by gates/berms or a signed closure order, 4 due to reclamation, 1 for being within the Middle Deschutes/Lower Crooked Rivers Wild and Scenic River Management Corridor, 2 for adjacency to private property and 1 for invasive species.

One of the reasons there are a number of active sources on both forests identified as closed, is to ensure weed free sources for agency internal aggregate needs. The Ochoco has already experienced increased aggregate haul costs for recreation projects due to a material source closure based on a medusahead infestation. For the Deschutes NF, 160 acres and 30 active material sources would remain open to non-highway-legal vehicle use. This is a reduction of 618 acres or 79% (778 total acres) from the existing sources for the Deschutes. For the Ochoco, 130 acres and 20 material sources would remain open. For the Grassland, 61 acres and 2 material sources would remain open. From the 628 acres of mineral material sources on the Ochoco NF and the Crooked River NG, this represents a reduction of 439 acres or 70%.

Some of the closed acreage is in active material sources, some of the acres represent sources in various stages of reclamation that presently are not used for mineral extraction or any other use, except for growing new trees. These acres haven't been used for mineral extraction in over 20 years in some situations.

Vegetation Management Activities and Wildfires

Executive Summary

This report considers the current condition along with the direct and indirect effects of the Proposed Action and Alternatives on past vegetation treatments (hazardous fuels, timber, and silviculture) that may result in forest conditions more conducive to motorized access and large wildfires across the Deschutes and Ochoco National Forests.

The effects of the proposed action and alternatives would have no direct and some indirect effects on the acres of vegetation treatments or acres burned by large wildfires that may result in forest conditions more conducive to motorized access.

Under Alternative 1, there would be an indirect adverse effect to the acres burned by large wildfires or that have had vegetation treatments currently open to motorized access off of designated routes or motorized access for dispersed camping (65,780 and 93,830 acres, respectively on the Deschutes National Forest and 45,418 and 55,515 acres, respectively on the Ochoco National Forest). These vegetation treatments and large wildfires may have created conditions that are more conducive to motorized access than many untreated areas, and therefore increase the potential for these areas to have unauthorized routes created in them. The creation of unauthorized routes could further disturb vegetation (beyond the need described in project goals) and possibly impede vegetation recovery.

Alternatives 2 and 3 would both eliminate the acres of vegetation treatments and acres burned by large wildfires available for motorized access off of designated routes (41,437 and 35,995 acres eliminated on

Deschutes and Ochoco National Forests, respectively) and restrict motorized access for dispersed camping to within 300' of open designated routes to varying degrees.

Alternative 2 would result in a total of approximately 38,573 and 12,199 acres (Deschutes and Ochoco National Forests, respectively) of vegetation treatments and acres burned by large wildfires potentially available for motorized access for dispersed camping.

Alternative 3 would eliminate the acreage of planned vegetation treatments or acres burned by wildfires (outside of continued designated areas) potentially available for motorized access for dispersed camping on both forests.

Affected Environment

Wildfire

Fire is a significant disturbance mechanism on the Deschutes and Ochoco National Forests and Crooked River National Grassland. Historical Forest records indicate that fires, both human and lightning-caused, have burned significant acreage across both Forests, despite fire suppression efforts. On the Deschutes, polygon fire history records (which generally contain fires larger than 100 acres) from 1908 to 2007 show that 238 fires have burned over 411,000 acres (approximately 318,000 acres of ground; 16% of the Forest total). On the Ochoco National Forest, similar fire history records from 1961 – 2007 show that 33 fires have burned nearly 57,000 acres (approximately 46,000 acres of ground; 6% of the Forest total).

Vegetation Treatments (Hazardous Fuels, Timber, and Silviculture)

The Deschutes and Ochoco National Forests are comprised of a complex mix of plant association groups (PAGs) including xeric mountain hemlock, xeric whitebark pine, xerix/mesic lodgepole pine, xeric/mesic mix conifer, xeric/mesic ponderosa pine, juniper woodlands/steppe, subalpine fir, mesic/xeric grand fir, meadows, shrublands, riparian areas, and grasslands. See 'Native Vegetation' Chapter for more information on plant association groups across the Forests.

For the purpose of this analysis, any hazardous fuels, timber, or silvicultural activity that reduces or rearranges fuels or stand/brush density is considered a vegetation treatment. Vegetation treatments are assumed to create conditions that are more conducive to motorized access off designated routes or motorized access for dispersed camping than many untreated areas[48]. Range improvement projects that also function to reduce hazardous fuels are included in this analysis. These vegetation treatments are generally classified into the following categories:

1. **Hazardous Fuels Treatments -** Any manipulation or removal of wildland fuels to reduce the likelihood of ignition or to lessen potential damage from fire and resistance to fire suppression. Methods include: chipping, crushing, piling, and burning (i.e., prescribed fire; Helms 1998). Mowing, thinning, yarding, and rearranging would also fall under this treatment.

2. **Intermediate Treatment -** Any treatment or tending designed to enhance growth, quality, vigor and composition of the stand after establishment or regeneration and prior to final harvest (Helms 1998). The primary method of accomplishing this treatment is thinning trees (e.g., sanitation, improvement, and/or commercial thinning), but pruning and salvage would also fall into this category.

[48] Suitability for motorized access off of designated routes or motorized access for dispersed camping (e.g., slope, vegetation type, proximity to urban areas) was not incorporated into this analysis. All acres presented as treated in this analysis are considered equally conducive for motorized access.

3. **Regeneration Treatment**- Any removal of trees intended to assist regeneration already present or to make regeneration possible. Methods include clearcutting, seed tree, shelterwood, group selection, single tree selection, and salvage cutting. Any of these methods may remove any remaining crop trees (i.e., overstory) as a final removal treatment; however, some or all of the remaining overstory can be retained as reserve trees (Helms 1998).

4. **Release Treatment –** Any treatment designed to free young trees from undesirable, usually overtopping, competing vegetation (Helms 1998). Weeding and slashing would fall into this category.

Depending on the site-specific treatment design, treatment types can fall into several categories (e.g., thinning, salvage) and multiple treatments are often used on the same acres of ground. Definitions of the treatment methods described above can be found in Appendix B-4.3.1.

From 1943 to 2009, approximately 608,000 acres on the Deschutes National Forest have received some sort of vegetation treatment that may result in forest conditions more conducive to motorized access. Approximately 94% (572,000 acres) of the total acreage treated intersects within 300 feet of an open designated route. Nearly 90% of the treatment activity reported occurred after 1980. From 1965 to 2008, approximately 224,000 acres on the Ochoco National Forest received a vegetation treatment that may result in forest conditions more conducive to motorized access. Approximately 82% (184,000) of these acres intersect within 300 feet of open designated routes. Nearly 99% of the treatment activity reported occurred after 1980[49].

Existing Conditions

2004-2008 – This grouping of projects is the most recent, and are likely to have the freshest and perhaps most distinct changes in vegetative conditions. During this time period, 112,915 and 59,738 acres of ground, respectively, on the Deschutes and Ochoco National Forests, received some sort of vegetation treatment that may have resulted in forest conditions more conducive to motorized access. Approximately 83% and 90%, respectively, on the Deschutes and Ochoco National Forests, of these acres are currently open to motorized access for dispersed camping, and 58% and 74%, respectively, on the Deschutes and Ochoco National Forests, of these acres are currently open to motorized access off designated routes. See Table 3-61 for a breakdown of these acres. See Appendix B-4.3.2 for project or planning area names and corresponding acres of treated ground, and the NEPA documents under which most of these acres were treated.

Table 3-61. Acres of planned vegetation treatments in areas open to motorized access off designated routes or motorized access for dispersed camping that may result in forest conditions more conducive to motorized access on the Deschutes National Forest from 2004 – 2008.

Forest	Open to motorized access off designated routes (acres)	Open to motorized access for dispersed camping (acres)
Deschutes NF	65,197	93,247
Ochoco NF	44,151	53,840

During this period on the Deschutes National Forest, most acres were treated through the following activities:

[49] The spatial component of the Forest Activity Tracking System (FACTS) was used to complete this analysis on the Deschutes National Forest. Forest-maintained GIS records were used to complete this analysis on the Ochoco National Forest. Spatial records may overestimate actual treatment completed on the ground. The extent of this overestimation was not determined.

- burning of piled material;
- piling of fuels (hand or machine);
- precommercial thinning;
- commercial thinning; and
- Yarding

During this time period on the Ochoco National Forest, most acres were treated through the following activities:

- precommercial thinning;
- underburning;
- pile burning;
- jackpot burning; and
- piling of fuels (hand or machine).

Additionally, 23,548 acres of the Deschutes National Forest was reported as burned by large wildfires during this time period (excluding 2008-data not available at time of analysis); 583 of these acres are currently open to motorized access for dispersed camping and open to motorized access off designated routes. These fires are listed in 3-62.

Table 3-62. Large wildfires on the Deschutes National Forest from 2004 to 2007. Fires names highlighted with bold text have burned in areas open to motorized access for dispersed camping and/or areas open to motorized access for dispersed camping

Fire Name	Year	Acres Reported	District
GW	2007	7357	Sisters
Woodside Ranch	2007	589	Bend Fort Rock
Lake George	2006	5550	Sisters
Cave	2005	652	Bend Fort Rock
Black Crater	2006	9400	Sisters

Additionally, 8,141 acres of the Ochoco National Forest was reported as burned by large wildfires during this time period (excluding 2008-data not available at time of analysis); **1,267** acres that are currently open to motorized access off of designated routes and **1,675** acres that are currently open to motorized access for dispersed camping. These fires are listed in Table 3-63

Table 3-63. Large wildfires on the Ochoco National Forest from 2004 to 2007. Fire names highlighted with bold text have burned in areas open to motorized access for dispersed camping and/or areas open to motorized access for dispersed camping

Fire Name	Year	Acres Reported	District
Buck Butte	2002	105	Crooked River NG
Geneva 3	2006	480	Crooked River NG
890	2006	382	Crooked River NG
Mill	2005	29	Lookout Mountain
Maxwell	2006	7145	Lookout Mountain

Pre - 2004 - This grouping of projects has occurred long enough ago that, depending upon site conditions, change from the vegetative conditions in place immediately following the treatment may have occurred. During this time period, 560,116 and 189,696 acres of ground, respectively, on the Deschutes and Ochoco National Forests, received some sort of planned vegetation treatment that may result in forest conditions more conducive to motorized access. Approximately 51% (285,605 acres) and 84% (159,739 acres), respectively, of these treated areas on the Deschutes and Ochoco National Forests, are currently open to motorized access for dispersed camping and 79% (441,512 acres) and 95% (180,932 acres), respectively, on the Deschutes and Ochoco National Forests, are currently open to motorized access for dispersed camping. The conditions resulting from these planned vegetation treatments and wildfires prior to 2004 are reflected in the 2004 satellite imagery which is used in support of the analysis of the vegetative conditions for this EIS for other resource specialties (e.g., Wildlife), and are therefore not presented in the body of this chapter. Appendix B-4.3.3 includes a detailed list of the wildfires and acres treated that were considered as contributing to this existing condition prior to 2004.

Fiscal year 2009 and beyond- At the time of this analysis, a comprehensive inventory of activities completed in fiscal year 2009 (October 1, 2008 – September 30, 2009) or those planned to be implemented in fiscal year 2010 was not yet available. For the purpose of this analysis, reasonably foreseeable future vegetation management activities are those that are "in-progress" or "completed", in terms of status in the National Environmental Protection Act (NEPA) planning process[50] or (as opposed to status of implementation on the ground). Explicit planned treatment acreage is available for "completed" projects only. Approximately 36,822 and 266 acres on the Deschutes and Ochoco National Forests are planned to be treated in the reasonably foreseeable future under NEPA completed in fiscal year 2009. These projects fall within areas with proposed closure decisions and can be found in Table 3-64 below.

Table 3-64. Reasonably foreseeable projects or planning areas on the Deschutes and Ochoco National Forests. Acres of treatment are listed for "completed" projects only.

Project Name	District	Acres
Deschutes National Forest		
Deadlog Vegetation Management Project	Bend Fort Rock	In Progress
Deschutes River Aspen Enhancement	Bend Fort Rock	40
Met Fuels Reduction	Bend Fort Rock	In Progress
Snow Hazardous Fuels Reduction Project	Bend Fort Rock	6,099
South Bend Hazardous Fuels	Bend Fort Rock	3,021
EXF Thinning Fuels Reduction, and Research Project	Bend Fort Rock	In Progress
Sparky	Bend Fort Rock	In Progress
West Tumbull HFRA	Bend Fort Rock	In Progress
BLT Vegetation Management and Fuels Reduction	Crescent	7,499
Sun Forest Fuels Reduction	Crescent	In Progress
SAFR	Sisters	17,573
Rim Paunina	Crescent	In Progress
2008 Small Diameter Thinning	Crescent	2,590

[50] The Planning, Appeals, and Litigation (PALS) database and the Schedule of Proposed Actions (SOPA) from April and July 2009 were used to derive information regarding future actions.

Project Name	District	Acres
Ochoco National Forest		
Round Butte 3 Fuel Reduction	Crooked River National Grassland	In Progress
Winter Range Habitat Improvement Project	Crooked River National Grassland	In Progress
Canyon Fuels and Vegetation Management	Lookout Mountain	In Progress
Gray Prairie Prescribed Burn	Lookout Mountain	In Progress
Bridge Creek Danger Tree Abatement	Lookout Mountain	196*
Upper Beaver Creek Vegetation Management Project	Paulina	In Progress
Wheeler Aspen Restoration Project	Paulina	70

Trees thinned for danger abatement along 5.2 miles of road, exact acreage treated will depend on danger tree location

Two sub-affected environments were established for analyzing effects. The first affected environment is the area more than 300' from the centerline of all open designated routes proposed to be closed to motorized access off designated routes or proposed to be closed to motorized access for dispersed camping. This affected environment will herein be known as, "the broader landscape". The second affected environment is the area within 300' from the centerline of all open designated routes that would continue to be open or is proposed to be open to motorized access for dispersed camping, seasonally and with special provisions (riparian and non-riparian). This area was isolated since the Proposed Action (Alternative 2) would allow for motorized access to dispersed camping within 300' of designated routes outside of designated, existing, and defined areas.

Analysis of Environmental Effects

Alternative 1

Under Alternative 1, there would be an indirect adverse effect to vegetation burned by large wildfires or that have had vegetation treatments. Vegetation treatments and large wildfires may have created conditions that are more conducive to motorized access than many untreated areas, and therefore increase the potential for these areas to have unauthorized routes created in them. The creation of these unauthorized routes could potentially further disturb vegetation (beyond the need described in project goals) and possibly impede vegetation recovery. Disturbance from motorized vehicles can directly impact vegetation through breaking and smashing of emergent seedlings, shrubs, and understory species. Additionally, disturbed ground can result in decreased vegetative cover and growth (Ouren et al. 2007). While these effects may not adversely impact hazardous fuels reduction objectives, they may adversely affect silvicultural or native plant restoration project goals where understory or seedling responses are desired outcomes (see Native Vegetation for more detail on effects to vegetation). Over time, the effect of Alternative 1 is the creation of additional and sustained use of unauthorized routes and consequently continued vegetation damage and possibly impeded vegetation response in areas where vegetation treatments and large wildfires have created conditions more conducive to motorized access than untreated areas. Table 3-65 summarizes the acres

potentially available for unauthorized route creation and consequently vegetation disturbance for Alternative 1 by Forest[51].

Table 3-65. Acres of vegetation treatments and large wildfires from 2004 – 2008 that may have resulted in forest conditions more conducive to motorized access that are open to motorized access for dispersed camping or open to motorized access for dispersed camping for Alternative 1.

Alternative 1	Open to motorized access off of designated routes	Open to motorized access for dispersed camping
Deschutes National Forest		
Vegetation treatments	65,197	93,247
Large wildfires	583	583
Total	*65,780*	*93,830*
Ochoco National Forest		
Vegetation treatments	44,151	53,840
Large wildfires	1,267	1,675
Total	*45,418*	*55,515*
Deschutes and Ochoco NF Total	**92,499**	**149,345**

Alternatives 2 and 3

Under Alternatives 2 and 3, there would be an indirect benefit to the acres that have been burned by large wildfires or have had vegetation treatments in areas with proposed closure decisions about motorized access. As with Alternative 1, these vegetation treatments and wildfires may have created conditions that are more conducive to motorized access than many untreated areas, and therefore increase the potential for these areas to have unauthorized routes created in them. Alternatives 2 and 3 would both eliminate the acres of vegetation treatments and acres burned by large wildfires potentially available for motorized access off of designated routes across the broader landscape; see Table 3-66 below) and restrict motorized access for dispersed camping to within 300' of open designated routes to varying degrees (see separate effects of Alternatives 2 and 3 below). Within the remaining area that will continue to be open to motorized access off designated routes (i.e. 'play areas' or rock/gravel pits), Alternatives 2 and 3 may lead to additional disturbance if future vegetation treatments are planned (there have been none in the past). This is unlikely as vegetation in these areas is minimal.

[51] Some of the acres documented as burned by large wildfires may be covered under recent fire closure orders which are not documented as "closed" in the continued existing condition of the Proposed Action and Alternatives. For the purpose of this analysis, these burned acres that are not documented as "closed" in the continued existing condition were assumed to be open to motorized access. See Chapter 2 for more detail on temporary closures across the Forests.

Table 3-66. Acres of vegetation treatments and large wildfires from 2004 – 2008 that may have resulted in forest conditions more conducive to motorized access that will NOT be available for unauthorized route creation and the percent reduction from the existing condition for Alternatives 2 and 3.

Alternatives 2 and 3	Open to motorized access off of designated routes in broader landscape (% reduction from existing condition)	Open to motorized access for dispersed camping in broader landscape (% reduction from existing condition)
Deschutes National Forest		
Vegetation treatments	41,061 (63)	56,838 (61)
Large wildfires	376 (64)	376 (64)
Total	*41,437 (63)*	*57,214 (61)*
Ochoco National Forest		
Vegetation treatments	34,858 (79)	42,640 (79)
Large wildfires	1,137 (90)	1,320 (79)
Total	*35,995(79)*	*43,960 (79)*
Deschutes and Ochoco NF Total Reduction in Acres	**77,432 (84)**	**101,174 (68)**

Alternative 2

As shown in Table 3-66 above, Alternative 2 would result in an approximate 61% and 79% (Deschutes and Ochoco National Forests, respectively) reduction in the acres of planned vegetation treatments and acres burned by large wildfires potentially available for motorized access for dispersed camping by eliminating the acres within across the broader landscape. Within the remaining area available for motorized access for dispersed camping within 300' of open designated routes, Alternative 2 may lead to additional disturbance from motorized vehicles in areas where motorized access for dispersed camping would not be subject to special provisions. This would be a result of the proposed action concentrating motorized users in this area and the potential for vegetation treatments (which are, for the most part, adjacent to open designated routes) to continue to result in forest conditions more conducive to motorized access in areas that would not be otherwise restricted. Table 3-67 summarizes these acres that would continue to be available for unauthorized route creation.

Table 3-67. Acres of vegetation treatments and large wildfires from 2004 – 2008 within 300' of open designated routes that may have resulted in forest conditions more conducive to motorized access that would be open to motorized access for dispersed camping under Alternative 2

Alternative 2	Open to motorized access for dispersed camping within 300' of an open designated route (acres)
Deschutes National Forest	
Vegetation treatments	34,948
Large wildfires	3,625
Deschutes Total	38,573
Ochoco National Forest	
Vegetation treatments	11,756
Large wildfires	443
Ochoco Total	12,199
Deschutes and Ochoco NF Total	**50,772**

Alternative 3

Under Alternative 3, the amount of area available for motorized access for dispersed camping would be limited to only those areas with existing, designated or defined sites. This would alter the potential for motorized access to affect vegetation management, since vehicles would be restricted to designated, existing, and defined dispersed camping sites, limiting future ground disturbance. This represents a complete reduction from the existing condition in the total acreage of planned vegetation treatments or acres burned by wildfires potentially available for motorized access on both Forests.

Invasive Plants

Executive Summary

Alternative 1 has the highest risk of invasive plant establishment, spread and expansion across the two Forests and Grassland because of the 3 Alternatives it has the most acres that are open to motorized access off designated routes and has few restrictions on motorized access for dispersed camping. Interior forest areas continue to be susceptible to the spread and establishment of invasive plants.

Overall, Alternatives 2 (Proposed Action) and 3 would have a beneficial effect. They would reduce impacts from invasive plants compared to Alternative 1 because motorized access would be prohibited off of designated routes. There is an exception – some mineral material source sites (52 of 531) would continue to be open for motorized travel off of designated routes, and motorized activities within these sites have a high risk of spreading invasive plants into and outside of these areas. Allowing motorized use in weed-infested areas would increase the chance of further spread to other areas. If invasive plants are introduced to an active material source site, the Forest Service would not be able to use the site to extract or dispose of material until the invasive plants are controlled (length of time for control would depend on the species).

Alternative 2 has a higher risk than Alternative 3 because motorized access for dispersed camping is allowed anywhere within the 300' buffer (except for those areas in Alternative 2 that are closed to this use or are designated as special provision areas). This risk is reduced in Alternative 3 because motorized access for dispersed camping is limited to existing, designated or defined sites, thus confining established populations of invasive plant populations, and reducing the potential for spread.

Affected Environment

An invasive plant is a non-native plant whose introduction does or is likely to cause economic or environmental harm or harm to human health (Executive Order 13122). Invasive plants are distinguished from other non-native plants in their ability to spread (invade) into native ecosystems. Some species of invasive plants are listed by the Secretary of Agriculture or by the responsible State official as "noxious weeds". This analysis includes all State-listed noxious weeds plus other invasive species that are of concern because of their impacts to ecosystem health. The term "invasive plants" more broadly encompasses all invasive, aggressive, or harmful non-indigenous plant species, whether designated noxious or not.

Table 3-68 lists mapped invasive plants that occur on the two Forests and Grassland. The majority of infestations (about 70%) occur along travel routes (roads and trail corridors). Several species occur in such abundance that only selective sites are mapped. These include cheatgrass (*Bromus tectorum*), North Africa grass (*Ventenata dubia*) and Russian thistle (*Salsola kali*).

The Forests and Grassland share many of the same invasive plant species, such as spotted and diffuse knapweeds, Canada and bull thistles, St. Johnswort, and Dalmatian toadflax. Yet, there are differences between the units as to which species are especially problematic. Medusahead, for example, is most abundant on the Crooked River National Grassland, while it occurs in very low numbers (if at all) on the other units. Though Dalmatian toadflax is established on Bend/Ft. Rock District, it is a new invader on the Grassland and, therefore, a high priority for treatment. Paulina District (Ochoco NF) contains the majority of houndstongue, yet has little medusahead; therefore, this species is a high priority for treatment before it encroaches onto other sites. Yellow star thistle is a high priority species for treatment on Lookout Mountain District; their one known site has been reduced from 5 acres to < ¼ acre through herbicide and manual treatments approved in a 1998 Environmental Assessment (USDA Forest Service 1998b). Spotted knapweed is well established in the city of Bend, Oregon, and road corridors continue to spread this species further onto adjacent Bend/Ft. Rock District (Deschutes NF) lands. Spotted knapweed is abundant on Sisters District, yet this District also contains the majority of diffuse knapweed on the Deschutes National Forest. Crescent District does not have the scale of invasive plant problems like the other units, yet it plays a vital role in early detection and rapid response of new invader species entering our area via major highways (e.g., Highways 97 and 58). In the past few years, individual plants of yellow starthistle, kochia, and hairy whitetop have been found along Highways 97 and 58 and hand-pulled before flowering and setting seed.

Table 3-68. Number of mapped sites and infested acres of invasive plant species that occur on the Deschutes and Ochoco National Forests and Crooked River National Grassland (CRNG).
**** = Extremely abundant; only a few selective sites have been mapped.**

Scientific Name	Common Name	DES # sites	DES Infested ac.	OCH # sites	OCH/CRNG Infested ac.
Acroptilon repens	Russian knapweed	-	-	8	28
Arctium minus	Lesser burdock	-	-	1	0.1
****Bromus tectorum*	Cheatgrass	5**	27**	**	**
Cardaria draba	Whitetop	-	-	73	6.6
Cardaria pubescens	Hairy whitetop	3	< 0.1		
Carduus nutans	Musk thistle	-	-	1	0.1
Centaurea debeauxii ssp. *thuillieri*	Meadow knapweed	-	-		
Centaurea diffusa	Diffuse knapweed	102	927	118	224
Centaurea solstitialis	Yellow star-thistle	4	< 0.1	3	5
Centaurea stoebe ssp. *micranthos*	Spotted knapweed	515	843	214	477
Centaurea spp.	Unidentified – either spotted or diffuse knapweed	18	23	-	-
Cirsium arvense	Canada thistle	108	329	307	110.6
Cirsium vulgare	Bull thistle	151	537	28	4
Convolvulus arvensis	Field bindweed	8	0.1	23	2
Cynoglossum officinale	Houndstongue	4	63	196	752
Cytisus scoparius	Scotch broom	34	179	6	0.5
Dipsacus fullonum	Teasel	-	-	17	2
Elymus repens	Quackgrass	3	21	-	-
Euphorbia esula	Leafy spurge	4	3	3	0.1
Hypericum perforatum	St. Johnswort	143	394	42	14
Iris pseudacorus	Yellow flag iris	Not mapped; occurs often with ribbongrass (see below)		-	-
Isatis tinctoria	Dyer's woad	1	< 0.1	-	-
****Kochia scoparia*	Kochia	**	**	**	**
Linaria dalmatica	Dalmatian toadflax	178	224	7	1.4
Linaria vulgaris	Butter and eggs	18	102	4	0.4
Linaria spp.	Unidentified *Linaria* species	1	1.4		
Onopordum acanthium	Scotch thistle	10	114	19	7.5
***Phalaris arundinacea*	Reed canarygrass	35	680	1	4
Phalaris arundinacea var. picta	Ribbongrass	~ 250 clumps scattered along 10 mi. Metolius River	~ 1	-	-

Scientific Name	Common Name	DES # sites	DES Infested ac.	OCH # sites	OCH/CRNG Infested ac.
Potentilla recta	Sulphur cinquefoil	-	-	41	3
Rubus discolor	Himalayan blackberry	-	-	1	0.1
Salvia aethiopis	Mediterranean sage			11	6.2
****Salsola kali*	Russian thistle	21	153	**	**
Senecio jacobaea	Tansy ragwort	32	194	-	-
Taeniatherum caput-medusae	Medusahead	5	10	253	3,327
****Ventenata dubia*	North Africa grass	-	-	**	**

Analysis of Environmental Effects

Alternative 1

Motorized Access Off of Designated Routes

Research has shown that vehicular routes are a primary pathway for plant invasions into arid and semi-arid ecosystems (reviewed in Brooks and Lair 2005). Vehicles serve as dispersal vectors for alien plant propagules (Clifford 1959) and disturbances within vehicular route corridors facilitate establishment of invasive plants (Greenberg et al. 1997). Off-highway vehicles (OHV) caked in mud acquired elsewhere potentially introduce or disperse seeds of non-native and invasive species; thus, OHV-route margins often become populated with exotics and invasives that eventually may spread and outcompete native species at the landscape level (Ouren et al. 2007). One study found that vehicles driven several feet through a spotted knapweed infestation can accumulate more than 2,000 seeds, and ten percent of the seeds remained on the vehicle ten miles from the infestation site (Sheley and Petroff 1999). Lonsdale and Lane (1994) demonstrated that weed seeds are being moved around and into Kakadu National Park in Australia on tourist vehicles. The results of a study by Clifford (1959) suggests that small-seeded species have a better chance of dispersal by incorporation in the mud beneath vehicles than large-seed species, and that season of year might determine the range and frequency of species.

Roads and trails create edge habitats, resulting in a variety of effects, including changes in vegetation and encroachment of non-native and invasive plant species (Ouren et al. 2007). Parendes and Jones (2000) found exotic species were more frequent along high-use and low-use roads than on abandoned roads or along streams. Roads enhance exotic species invasion in the landscape by acting as corridors or agents for dispersal, providing suitable habitats, and containing reservoirs of propagules for future episodes of invasion. Tyser and Worley (1992) described alien flora in nine fescue grassland study sites adjacent to three types of transportation corridors – primary roads, secondary roads, and backcountry trails – in Glacier National Park, Montana, and found roadsides are especially vulnerable to colonization by alien flora and then function as sites of prolific seed production.

Gelbard and Belnap (2003) concluded that paved and improved surface roads had more invasive plants than gravel roads or four-wheel drive tracks in Utah's Canyonlands National Park. As roads are improved, the verges adjacent to them tend to become wider and to contain an increasing cover of exotic plant species. They determined the process of constructing paved roads disturbed more land (23 feet each side of the road) than the two-track road (3 feet). A similar study in Glacier National Park found spotted knapweed and yellow toadflax along primary and secondary roads but not along backcountry (non-motorized) trails. Also, weed abundance was higher within the first 25 meters than at 100 meters, suggesting that the roads were the primary source for weed dispersal.

Brooks and Lair (2005) provide examples of the typical pattern of plant invasions in the Mojave Desert. First, new invaders appear along roadsides near their adjacent regions of origin. In some cases, invaders may "island hop" into the region by establishing first in urbanized or agricultural regions, then move outward along roadsides into less developed areas. Once within the region, invaders are pre-positioned to begin the second phase of invasion, the spread away from roadsides into wildland areas. The initial stages of spread away from vehicular routes occurs within landscape features (e.g., washes or north facing hill slopes) or microsites (e.g., beneath perennial shrubs) where soil moisture levels are locally high. Disturbed areas adjacent to roadsides are also more readily invaded, such as utility corridors, areas with high OHV use, or burned areas. The third and final stage of invasion is the naturalization of invader populations in wildland areas away from roads.

Soil compaction also increases the potential for invasive, non-native annuals and other early successional plants to establish rapidly in OHV routes, whereas native perennials may require at least 5 years to become established (Ouren et al. 2007). Davidson and Fox (1974) found a significant loss of herbaceous vegetation in areas disturbed by motorcycle activity, and that non-native, early-successional species, such as redstem stork's bill (*Erodium cicutarium*), were common at sites disturbed by off-road motorcycle activity.

Alternative 1 allows unrestricted motorized access off of designated routes. As discussed above, motorized vehicles are known vectors for spreading invasive plants, and disturbed habitats created by motorized recreation are vulnerable to invasive plants. In Alternative 1, 19% of the acres occupied by invasive plants on the Deschutes National Forest and 21% on the Ochoco National Forest would be open for motorized travel off of designated routes (Table 3-69). Invasive plants in these areas have a higher risk of spreading than under Alternatives 2 and 3, in which the majority of mapped invasive plant acres are closed to motorized travel off of designated routes Table 3-69 shows that 100% of occupied invasive plant acres are closed to motorized travel off of designated routes; however, since this data was tabulated, the Proposed Action was modified to allow for keeping some mineral material source sites open (*see discussion under Alternatives 2 and 3, Mineral Material Source Sites*).

Table 3-69. Percent of invasive plant acres closed and open for motorized access off designated routes under Alternative 1 (Existing Condition) and Alternatives 2 and 3 for the Forests and Grassland.
See Appendices B-4.1.1 and B-4.1.3 for more information.

Unit	Alt. 1 % Closed	Alt. 1 % Open	Alt. 2 & 3 % Close	Alt. 2 & 3 % Open
Deschutes NF	81 (48,976 ac.)	19 (11,742 ac.)	100 (60,696 ac.)	0
Ochoco NF and CRNG	79 (7,054 ac.)	21 (1,852 ac.)	100 (8,898 ac.)	0
Summary Conclusion	Higher risk that invasive plants will continue to spread and establish		Reduces impacts from invasive plants as all acres (100%) are closed to motorized access off designated routes	

Motorized Access for Dispersed Camping

The analysis for considering the effects of motorized access off of designated routes and motorized access for dispersed camping are considered separately, even though there is some overlap in the designations.

As discussed earlier, vehicles serve as dispersal vectors for alien plant propagules (Clifford 1959) and disturbances within vehicular route corridors facilitate establishment of invasive plants (Greenberg et al. 1997). Within areas open for motorized access for dispersed camping where there are no general or special provisions, it is reasonable to assume that existing invasive plant infestations will continue to expand into disturbed areas, and new populations are likely to become established from seeds and plant propagules carried into these areas by vehicles.

Alternative 1 has few restrictions on the Forests and Grassland for motorized access for dispersed camping compared to Alternatives 2 and 3, which limit motorized access for dispersed camping within 300' of the centerline of roads that are designated as open for motorized travel. Under Alternative 1, dispersed camping areas can be more than 300' away from the road and there are no general or special provisions as under Alternatives 2 and 3. The majority (~ 70%) of inventoried invasive plant sites occur along roads. Invasive plants spread along travel corridors. Because Alternative 1 allows unrestricted motorized access for dispersed camping, this alternative has a higher risk of spreading invasive plants further into interior native plant habitats.

On the Deschutes National Forest, 65% of occupied invasive plant acres are within areas open for motorized access for dispersed camping under Alternative 1 (Table 3-70). This is reduced to 28% for Alternatives 2 and 3. Given that the majority of invasive plant sites are within open areas (for dispersed camping) and the fact that Alternative 1 allows mostly unrestricted motorized access for dispersed camping, it is reasonable to conclude that Alternative 1 would have an adverse effect of spreading invasive plants.

On the Ochoco National Forest, 23% of occupied invasive plant acres are within areas open for motorized access for dispersed camping under Alternative 1 (Table 3-70). This is increased to 38% for Alternatives 2 and 3 because areas on the Grassland would be designated as open for motorized access for dispersed camping that are currently closed under Alternative 1. However, under Alternative 1, motorized access for dispersed camping can occur anywhere, whereas this use is restricted to within 300'of open designated routes in Alternatives 2 and 3. Furthermore, Alternative 1 does not have special provisions as does Alternatives 2 and 3; therefore, Alternative 1 provides less protection from invasive plant spread and establishment.

In conclusion, Alternative 1 has the highest risk of invasive plant establishment, spread and expansion because it allows unrestricted motorized travel off of designated routes and does not have general or special provisions related to motorized access for dispersed camping.

Table 3-70. Percent of invasive plant acres closed and open for motorized access for dispersed camping (MADC) under the different alternatives..
See Appendices B-4.1.2 and B-4.1.4 for more information.

Unit	Alt. 1 % Closed	Alt. 1 % Open	Alt. 2 % Close	Alt. 2 % Open & Alt. 3 Open Special Provisions Non-Riparian	Alt. 2 & 3 % Open Special Provisions Non-Riparian	Alt. 2 & 3 % Open Special Provisions - Riparian
Deschutes NF	35 (21,139 ac.)	65 (39,578 ac.)	72 (43,365 ac.)	16 (9,380 ac.)	8 (4,859 ac.)	4 (2,668 ac.)
Ochoco NF and CRNG	77 (6,887 ac.)	23 (2,015 ac.)	61 (5,467 ac.)	7 (643 ac.)	18 (1,604 ac.)	13 (1,193 ac,)
Summary Conclusion	Alt. 1 has the highest risk of invasive plant		Alternative 3 provides the most protection of all three alternatives against establishment, spread, and expansion of			

	establishment, spread and expansion because it does not have general or special provisions related to motorized access for dispersed camping and the majority of invasive plant sites are within areas open for camping.	invasive plant populations because all areas open for motorized access for dispersed camping (100%) would be confined to existing, designated, and defined sites and this would reduce the potential to further spread the invasive plants. Alternative 2 has some upland occupied invasive plant acres (16% on the Deschutes National Forest and 7 % on the Ochoco National Forest) that occur in areas where motorized access for dispersed camping would not be confined to existing, designated, or defined sites. Therefore, invasive plants have a higher likelihood of establishing, spreading and expanding under Alternative 2 than under Alternative 3.

Alternatives 2 and 3

Alternatives 2 and 3 both prohibit motorized travel off of designated routes. They allow motorized access for dispersed camping within 300' of open designated routes; however, they prohibit camping within 30' of water bodies.

The primary difference between Alternatives 2 and 3 is that Alternative 3 confines motorized access for dispersed camping to existing, designated, or defined camp sites ("special provisions"), whereas Alternative 2 incorporates a combination of special provision areas but also has some upland areas in which motorized access for dispersed camping can occur anywhere within the 300' area and is not confined to existing, designated, or defined sites.

Motorized Access Off Designated Routes

Alternatives 2 and 3 would reduce impacts from invasive plants because the majority of acres occupied by invasive plants are closed to motorized travel off of designated routes (Table 3-69 and Appendices B-4.1.1 and B-4.1.3), which is expected to prevent further spread of invasive plants by motorized vehicles. Prohibiting motorized access off of designated routes would reduce the amount of disturbed habitat, and therefore reduce spread of invasive plants into interior areas. Table 3-69 shows that 100% of acres under Alternatives 2 and 3 are closed to motorized travel off of designated routes; however, since this data was tabulated, the Proposed Action was modified to allow for keeping some material source sites (52 of 5431) open for motorized travel off of designated routes (*see Material Source Sites under Alternatives 2 and 3, below*). Some material sources have been inventoried for invasive plants and contain invasive plants; others have not been inventoried and the status is unknown (Table 3-71).

Invasive Plant Regional Standard #1 (now incorporated as a Standard in both the Deschutes and Ochoco Land and Resource Management Plans), requires: "Prevention of invasive plant introduction, establishment and spread will be addressed in watershed analysis; roads analysis; fire and fuels management plans, Burned Area Emergency Recovery Plans; emergency wildland fire situation analysis; wildland fire implementation plans; grazing allotment management plans, recreation management plans, vegetation management plans, and other land management assessments" (USDA Forest Service 2005).

Prevention strategies incorporated into Alternatives 2 and 3 are:

- Prohibiting motorized access off designated routes would reduce the potential for invasive plant spread and establishment.
- Conditions for motorized access for dispersed camping are limited to general and special provisions across the two Forests.
- Some routes with known high levels of aggressive invasive plants would prohibit motorized access for dispersed camping within 300' of designated routes.

- 479 of the 531 material source sites (see Material Source Sites, below) would be closed to motorized travel off designated routes. Of these 479 closed material source sites, 16 on the Deschutes National Forest and 22 on the Ochoco National Forest known to have invasive plants, would prohibit motorized access off designated routes, thus helping to prevent further spread of these invasives .

Material Source Sites

On the Forests and Grassland, there are rock and/or cinder pits (called mineral material source sites), many of which are currently open to motorized use. The Deschutes has 200 mineral material sources and the Ochoco and Grassland have 331 sites (see Minerals and Geology report). The majority of material sources sites (479 of 531) would be closed to motorized travel off of designated routes and the reasons for closure are detailed in the Geology Appendix B-2. Of 531 material source sites on the Forests and Grassland, 52 are proposed to remain open to recreation activities and dispersed camping: 30 on the Deschutes; 20 on the Ochoco, and 2 on the Grassland (Table 3-71**)**. Of these 52 material source sites, some have known invasive plant sites, whereas the status in others is unknown and invasive plant surveys are needed.

As discussed under Alternative 1, motor vehicles are known vectors for spreading invasive plants. Habitats disturbed by motorized recreation are vulnerable to invasion. Allowing motorized travel off of designated routes within weed-infested material source sites would increase the risk and potential for invasive plant spread and establishment. This risk is not limited to the material source sites; unclean vehicles leaving these sites can carry seeds and plant propagules into new areas.

The Forests and Grassland are currently developing an Environmental Impact Statement (EIS) for treating invasive plants. The analysis for this EIS includes treatment of invasive plant sites within these material source sites. If this EIS is approved, then future treatment of mineral material source sites would follow the direction and mitigations developed in this analysis. The EIS includes an Early Detection/Rapid Response Strategy that – if approved – would provide a strategy for treating newly discovered invasive plant infestations in these sites.

Table 3-71. Mineral material source sites proposed to be open to motorized access on the Deschutes and Ochoco National Forests and Crooked River National Grassland.
** Status column refers to the level of mineral material activity. Status codes are:

- Active = Actively used for mineral material extraction, waste disposal or stockpiles
- Inactive = Not currently being used but could in the future
- Closed = Material sources have been exhausted and it will not be used as a mineral material site.

Material Source #	Material Source Name	Acres	Status	Invasive Plants
Deschutes – Bend/Ft. Rock District				
1006	North Siah Cinder Pit	2.32	Inactive	Unknown
1008	Siah Cinder Pit	0.87	Inactive	Unknown
1040	Sprague Gravel Pit	6.44	Waste Disposal Site	Unknown
1057	West Browns Creek Gravel	6.44	Inactive	Unknown
1112	East Spillway Borrow Pit	17.12	Active	Unknown

Material Source #	Material Source Name	Acres	Status	Invasive Plants
3004	Coyote Butte Cinder Pit	4.91	Inactive	Spotted knapweed (~ 5,000+ plants), Russian thistle (~ 5,000+ plants, and Dalmation toadflax (~ 500 plants)
3018	Pipeline Cinder Pit	5.35	Inactive	Unknown
3022	Sand Flat Cinder Pit	6.66	Inactive	Unknown
3040	Ground Hog Cinder Pit	1.37	Inactive	Unknown
3041	Sabol Butte Cinder Pit	5.31	Inactive	Unknown
Deschutes – Crescent District				
2003	Maklaks Cinder Pit	1.16	Inactive	Unknown
2004	Black Rock Cinder Pit	16.12	Active	
2005	Mabel Butte Cinder Pit	7.76	Inactive	Unknown
2008	Muttonchop Cinder Pit No. 1	10.54	Active	Unknown
2011	Junction Rock Quarry	6.41	Inactive	Unknown
2022	Burlington Pumice Pit	0.59	Inactive	Unknown
2023	Northern Pumice Pit	0.61	Inactive	Unknown
2026	Paunina Pumice Pit	2.95	Inactive	Unknown
2028	Cove Gravel Pit	0.56	Inactive	Unknown
2033	Crescent Creek Gravel Pit	0.61	Inactive	Unknown
Deschutes – Sisters District				
5006	Cache Cinder Pit	2.21	Inactive	Unknown
5008	Zimmerman Cinder Pit	16.72	Active	Unknown
5009	Fourmile Cinder Pit	4.93	Active	Unknown
5011	Melvin Cinder Pit	4.79	Inactive	Unknown
5015	Whychus Creek Gravel Pit	4.63	Active	Unknown
5016	Pole Creek Cinder Pit	3.53	Inactive	Unknown
5019	Garrison Cinder Pit	4.53	Inactive	Unknown
5022	McKenzie Gravel Pit	4.00	Inactive	Unknown
5033	North Sisters Gravel Pit	4.52	Inactive	Unknown
5045	East Sullivan Rock Quarry	5.70	Inactive	Unknown
Ochoco NF – Lookout Mt. District				
132009331	Ahalt	6.62	Closed (currently dispersed campground, OHV use)	Unknown
181912133	Chipmunk	12.42	Active	Surveyed and no weeds
132004441	Crystal	1.38	Closed	Unknown
121715333	Highland	8.10	Active	Surveyed and no weeds

Material Source #	Material Source Name	Acres	Status	Invasive Plants
121935211	Mcginnis	2.93	Active	Teasel
142230321	North Fork	15.33	Active	Spotted knapweed and Scotch thistle
132219331	Scott's Camp	1.71	Waste Disposal	Surveyed and no weeds
18192133	Sherwood Saddle	5.27	Waste Disposal	Surveyed and no weeds
13133241	Thunder Rock	2.04	Active	Surveyed and no weeds
132022441	Walton Lake	12.43	Active	Canada thistle
121828343	Whiskey	8.30	Active	Oxeye daisy treated; moderate risk of weeds because lot of uses (vectors)
Ochoco NF – Paulina District				
132329422	Aspen	9.01	Active	Mullein
152533432	Bellworm	7.82	Waste Disposal	Unknown
142336412	Flow Top	0.52	Closed	Unknown
142336442	Grasshopper	0.51	Closed	Unknown
142336122	Juniper	0.57	Closed	Unknown
142414232	Podo Meadow	1.43	Stockpile	Mullein
132314222	Remington	1.84	Closed	Unknown
142432112	Six Corner	11.89	Active	Surveyed and no weeds
142408342	Thornton	19.92	Closed (currently dispersed campground with OHV use)	Unknown
Crooked River National Grassland				
111336415	Metolius	20.66	Active	~ 50 Russian thistle and ~ 50 diffuse knapweed plants found in 2009
111213435	Round Butte	40.49	Active	Spotted knapweed and medusahead; shared with Oregon Dept. of Transportation

In 2005, the USFS Pacific Northwest Region revised Forest Land and Resource Management Plans with Standards for preventing and managing invasive plants (USFS 2005). Regional Invasive Plant Standard #7 requires the Forests and Grassland to: "Inspect active gravel, fill, sand stockpiles, quarry sites, and borrow material for invasive plants before use and transport. Treat or require treatment of infested sources before any use of pit material. Use only gravel, fill, sand, and rock that is judged to be weed free by District or Forest weed specialists." The intent of this standard is prevention – to prevent further invasive plant spread and establishment. The Deschutes and Ochoco National Forests Land and Resource Management Plans were amended to include this Standard.

Of the 52 material source sites proposed to be open for motorized use, 8 of the 30 Deschutes sites and 11 of the 22 Ochoco and Grassland sites are actively used for material sources (Table 3-71). Allowing motorized use of these active mineral material source sites has a high risk of introducing and spreading invasive plants within the sites as well as a high potential for motorized vehicles to carry seeds and plant parts out of the site, dispersing them into other areas (i.e., wherever the vehicles may travel). Because Alternatives 2 and 3 allow motorized travel off of designated routes in active material source sites and because the Forests and Grassland do not yet have the ability to treat weeds in these sites aggressively (i.e., we cannot use herbicides in many of these sites), there are likely to be adverse effects from further invasive plant spread. If invasive plants are introduced to an active material source site, the Forest Service would not be able to use the site to extract or dispose of materials (length of time would depend on the species).

Motorized Access for Dispersed Camping

Alternatives 2 and 3 provide greater protection than Alternative 1 against invasive plant spread and establishment on the Deschutes National Forest because 72% of occupied invasive plant acres would be closed to motorized access for dispersed camping compared to only 35% under Alternative 1. Since vehicles serve as dispersal vectors for invasive plant propagules (Clifford 1959; Greenberg et al. 1997), restricting motor vehicle access where invasive plants occur would help reduce the potential for these populations to spread.

On the Ochoco National Forest and Grassland, more acres of invasive plant sites are closed under Alternative 1 than under Alternatives 2 and 3 for motorized access for dispersed camping (Table 3-70). As discussed in the Chapter 2 of the EIS, much of the Grassland is currently closed to motorized travel; some currently-closed areas would open for motorized access for dispersed camping under Alternatives 2 and 3. However, under Alternative 1, motorized access for dispersed camping can occur anywhere, whereas this use is restricted to within 300' of open designated routes in Alternatives 2 and 3.

Since invasive plants follow travel corridors and motorized access for dispersed camping under Alternatives 2 and 3 will concentrate this use in the 300' buffer zone, invasive plants will continue to spread and become established along open designated routes. Though interior forest areas would be better protected from invasive plants under Alternatives 2 and 3, there could still be adverse impacts from invasive plants within 300' of open designated routes. Alternative 2 has a higher risk than Alternative 3 because motorized access for dispersed camping is allowed anywhere within the 300' buffer (except for those areas in Alternative 2 that are closed to this use or are designated as special provision areas). This risk is reduced in Alternative 3 because motorized access for dispersed camping is limited to existing, designated, or defined sites.

Under Alternative 2, 16% of upland occupied invasive plant acres are within areas open for motorized access for dispersed camping with general (not special) provisions, meaning that motorized access for dispersed camping is not confined to existing, designated, or defined sites (Table 3-70; Appendices B-4.1.2 and B-4.1.4). The potential creation of new dispersed campsites under Alternative 2 in upland areas increases the risk of invasive plant spread and establishment over Alternative 3. Alternative 3 provides a higher level of protection against invasive plant spread and establishment over Alternative 2 because motorized access for dispersed camping is confined to existing, designated, or defined sites, which limits the areas where people can drive and camp (Table 3-70; Appendices B-4.1.2 and B-4.1.4)

Alternatives 2 and 3 have the same riparian special provisions. Motorized access for dispersed camping is not allowed within 30' of water and, in riparian areas, is confined to existing, designated, or defined sites. This is intended to protect riparian habitats, including riparian vegetation and bank stability, and would help prevent spread and establishment of invasive plants.

In conclusion, Alternative 3 provides the most protection of all three alternatives against establishment, spread, and expansion of invasive plant populations because all areas open for motorized access for dispersed camping (100%) would be confined to existing, designated, and defined sites and this would reduce the potential to further spread the invasive plants. Alternative 2 has some upland occupied invasive plant acres (16% on the Deschutes National Forest and 7 % on the Ochoco National Forest) that occur in areas where motorized access for dispersed camping would not be confined to existing, designated, or defined sites. Therefore, invasive plants have a higher likelihood of establishing, spreading and expanding under Alternative 2 than under Alternative 3.

Recreation

Executive Summary

This section summarizes the analysis of the effects from implementing actions proposed in this EIS on recreational motorized access, including motorized access on designated roads and trails for different vehicle classes, motorized access off designated routes, motorized access for dispersed camping, motorized access for hunting and gathering, and the effects of recreational motorized access on non-motorized recreation use.

In Alternative 1, continuing to allow motorized access off designated routes would likely result in a continued increase in unauthorized "user-created" motorized routes. There would continue to be confusion among forest visitors about where or when motorized access is or is not allowed, or for what type of vehicle, and how or where to find that information. Conflicts between motorized and non-motorized users would continue and escalate as visitor use increases over time.

With Alternative 1 there would continue to be impacts to non-motorized users from noise, dust, and proximity to motorized uses which would be expected to increase with population growth and higher forest visitation. Non-motorized trails that are located within areas open to motorized access off designated routes would continue to receive increasing motorized use as the trail character and dimensions change and become more indistinguishable from a motorized trail.

Under Alternative 1, as population increases, over time, new motorized routes would likely be created to either existing or new campsites to accommodate demand, especially in prime areas (near streams, lakes, or other attractive features). Resource impacts such as soil compaction and erosion and loss of vegetation would continue to occur and increase with increased use.

With Alternatives 2 and 3, effects to motorized use would include a loss of access to non-highway legal vehicles to some additional roads that would be open only to highway legal vehicles. The roads that are open to non-highway legal vehicles may be fragmented by roads that are open only to highway legal vehicles which would not provide connectivity to make connections to other roads to reach desired destinations. There is expected to be increased use on designated roads and trails with more interaction and potential conflicts between different classes of motorized vehicles, especially on mixed use roads.

The proposed actions common to both Alternatives 2 and 3 would prohibit motorized access off designated routes on approximately 1,612,937 acres on the Deschutes and 723,855 acres on the Ochoco National Forest and Grassland which would result in a change in users' ability to access the forest as they have in the past as motorized use would be limited to designated routes. Restricting access to designated roads and trails would primarily affect people who prefer a more primitive off-road recreation experience than designated roads and trails offer (see Social and Economic Analysis section). User discretion to travel off designated routes to make connections to roads open to non-highway legal vehicles would be lost. Neither of the action alternatives provides provisions for motorized access off designated routes for hunting and gathering purposes. This would have the highest impact on those that may depend more upon a motor vehicle for access as they would no longer have access off of designated routes to pursue these activities.

Under Alternative 2 and 3, restricting motorized access for dispersed camping under the General Provisions, or to designated, defined, or existing sites under the Special Provisions would most affect people using recreation vehicles (RV's) such as trailers, campers, toy haulers, motor homes, etc. These users would not be able to access sites beyond 300' off designated routes with their RV's, unlike tent campers, who would have

the option to walk to their desired site. It is expected that some people may not be able to access their favorite spot because it is already occupied. This would displace some visitors to other areas.

Alternatives 2 and 3 would result in a substantial increase in the areas where non-motorized recreation users could expect to not encounter or be impacted by motorized users. The proposed actions common to both Alternatives 2 and 3 would prohibit motorized access off designated routes on approximately 1,611,862 acres on the Deschutes and 723,644 acres on the Ochoco National Forest or 100% of the acreage currently open to motorized access off designated routes. It is expected that there would be a beneficial effect for non-motorized users on the miles of non-motorized trail located within areas currently 'open' to motorized access off designated routes because there would be reduced motorized access to these trail systems, and a reduction in the potential for inadvertent use of these non-motorized trails by motor vehicles as they become undistinguishable from motorized trails

Affected Environment

Recreation Opportunities

Recreation opportunities on the Deschutes and Ochoco National Forests are a local and regional resource. The diversity of Cascade and Blue mountain settings, defined by terrain, scenic beauty, and types of access available offer outstanding recreation opportunities to uses of these National Forest lands. The diverse types of recreation that occur include hunting, fishing, hiking, dispersed and developed camping, picnicking, horseback riding, mountain bike riding, ATV and motorcycle riding, jeep and 4WD touring, rafting, skiing, among many others.

Recreation Niche

The niche is, in part, determined by public expectations (demand) and by the ecological capabilities of the land. In 2005 and 2006, each Forest developed a recreation niche statement. Public participants in this process described and mapped their preferred recreation activities and where they recreate. This "sense of place" map product was translated into a narrative about the relative importance of the Forest for various recreation opportunities, experiences and benefits, and was used to develop the recreation niche statement. For more details on the Recreation Niche see Appendix B-9.

Developed Recreation Sites

The Deschutes National Forest manages 319 developed recreation sites: 101 campgrounds; 26 picnic (day-use) sites; 93 trailheads; 2 rental cabins; 11 horse camps; 17 interpretive/info sites; 14 snowparks ; two visitor centers and other minor sites. The only developed sites that currently allow OHV's are China Hat Campground, Edison and East Ft. Rock OHV Staging areas and Trailheads.

The Ochoco National Forest manages 71 developed recreation sites including 30 campgrounds; 7 picnic (day-use) sites; 26 trailheads; 1 rental cabin; 3 horse camps; and 4 snowparks (and other minor sites).

Motorized Access off Designated Routes

On the Deschutes, motorized travel off designated routes is prohibited for all vehicles on 198,908 acres and closed to OHV use in 59,412 acres of the Forest. On the Ochoco, motorized travel is prohibited for all vehicles in 87,990 acres of the Forest and prohibited off designated routes in 204,081 acres. These include designated wilderness areas, wild and scenic river corridors, certain municipal watersheds, specific land use allocations and other sensitive areas. Since OHVs are allowed in areas of the Forest not specifically closed to such use, 625,430 acres on the Deschutes and 431,784 acres on the Ochoco are theoretically available

either year round or seasonally for motorized recreation. On both Forests, an indeterminant number of acres are inaccessible because of excessive slope, or other physical barriers (such as rock outcrops, forest vegetation, rivers and streams).

Motorized Access on Designated Routes

Oregon State Law allows OHVs to travel on one-lane gravel and native-surface roads (Oregon 2007). There are areas of the Forest where the Land and Resource Management Plan, as amended, do not specifically prohibit cross-country travel by recreational vehicles. On the Deschutes, approximately 5,362 miles of road are available for OHV use (all ATV classes). In addition, there are 343 miles of trail open to motorized travel for ATV's and motorcycles including 25 miles open to 4WD jeeps on the Forest. On the Ochoco, approximately 1,388 miles of road are available for OHV use (all ATV classes). An additional 1,648 miles of road are open only to highway licensed vehicles. Certain classes of ATVs are also permitted on roughly 26 miles of forest trails (See Table 3-72 for a complete list of the trail systems on the two Forests and BLM).

Although the extensive road system and motorized trails on both Forests provide motorized access on designated routes for many types of vehicles, roads and designated trails do not always provide the recreational experience that many people look for with their off-highway vehicles. The road and/or trail system also does not always provide the connectivity to desired destinations such as favorite campsites, people's homes, or community services. There are over 6,132 miles of road, of which 5,362 miles are open to both highway legal, and non-highway legal vehicles. Such an extensive network of roads and trails provides users with a tremendous variety of options to access and view the Forest. Most of the land base on both Forests and Grassland is accessible within a short distance from a designated road or trail. Approximately 88% of the Deschutes National Forest and 83% of the Ochoco National Forest (outside of wilderness areas) is accessible within ½ mile from an open road (see Table 3-76) – Deschutes and Ochoco Forest Acres within ½ Mile of Open Road and OHV Trail Systems

Deschutes National Forest Designated OHV Trail Systems

The East Fort Rock OHV trail system lies on the east side of the Bend/Fort Rock Ranger District on the Deschutes National Forest. East Fort Rock provides 318 miles of trail for casual and competitive use covering about 110,000 acres and ranging in elevation from 4400 to 6400 feet. Trails are well signed and mapped and provide a full range of experience levels, from easiest to most difficult. There are 4 staging areas, (2510, 25, Camp II and South Lava) one campground/staging area (China Hat) and four designated play areas (Ground Hog Rock Crawl, Sabol Butte, South Cinder Cone and Ice Rock Quarry).

The trail system is designed for Class I and Class III ATVs which are quads or three-wheelers and motorcycles less than 50" in width. Off-highway vehicles are allowed on designated routes and areas only. Non-street legal motorcycles and ATV's are permitted to ride roads designated as mixed use.

The trail system is open all year, however hot, dusty conditions normally inhibit riding from mid-July through September and cold, snowy conditions inhibit riding from mid-December through March. About half of East Fort Rock is within the Fox Butte Green Dot Area which restricts access to designated roads during the general deer hunting season. This is roughly a two-week period from late September to mid-October, and any roads or trails within the Green Dot Area are subject to Green Dot restrictions.

The Edison Butte Trail System, about 25 miles long, is located on the slopes of Kwolh Butte and Sheridan Mountain, west of Bend. Edison Butte is open to OHV use from April 1 through November 30. The recommended riding season is late June to October because of the high elevation and tendency of snow to

cover the trail into the spring and summer months. Edison is open to Class I – quads, Class II vehicles under 80 inches wide and Class III - motorcycles.

The trail system goes through ponderosa pine and manzanita forest in the lower elevations, near the Edison Sno-Park, and goes up into stands of hemlock trees near Kwolh Butte and Sheridan Mountain. The volcanic terrain can be challenging because there are many loose rocks and lava ridges to go over. As a result, the trails are considered "More Difficult". Two shelters are situated along the trail, the Sheridan Mountain and the Kwolh Butte shelters, which offer impressive views of the Central Oregon Cascade Mountains.

The staging area for this trail system is at the Edison Sno-park. An information board, maps and a vault toilet are available on site.

Ochoco National Forest and Crooked River National Grassland Designated OHV Trail Systems

The Green Mountain trail is northeast of Prineville in the Ochoco National Forest. The 8.5-mile trail designed for Class I and Class III ATVs winds along open ridge tops, which offer spectacular views, and passes through ponderosa pine stands. This trail offers a wide range of scenic views and riding experiences. The elevation ranges from 4500-5400 feet. The trail is open year round unless closed due to snow, high fire danger or wet soil conditions.

Henderson Flat OHV trail system is part of the Crooked River National Grassland and is characterized by open juniper vegetation spread over steep to rolling hills and interspersed with dramatically beautiful red rimrock breaks. The trails overlook the Deschutes Basin with spectacular views of the Cascade Range. The system provides 18 miles of casual OHV use covering 1480 acres and ranging in elevation from 3000 to 3400 feet.

The trail system is designed for Class I and Class III ATV's which are allowed on designated routes and areas only. Non-street legal motorcycles and ATV's must stay on designated trails; they may not ride on roads.

The trail system is open from April 1 through November 30. The best riding takes advantage of the cooler, moister periods of early spring and late fall. Hot, dry conditions normally inhibit riding from mid-July through September. In extreme fire conditions, the trails may be closed to public use. Individual trails may also be temporarily closed for maintenance or reconstruction, or to provide resource protection.

Prineville Bureau of Land Management (BLM) Designated OHV Trail Systems

Millican Valley Trail Systems

North Millican lies north of Highway 20, about 24 miles east of Bend and is located on the Prineville District of the Bureau of Land Management. The 102 miles of trails are well signed and provide a full range of difficulty from easiest to most difficult. Three trailheads/staging areas provide access to the trails. The terrain is typical of the High Desert, with rolling hills covered with sagebrush and juniper trees. The soils are sandy with scattered rock outcrops. The best riding is in the spring or fall when there is moisture. Elevation in the North Millican valley ranges from 3300-4200 feet.

The trails system provides opportunities for Class I, Class II and Class III ATVs. Of the 102 miles of trails, 24 are open to all three classes of ATV's the rest are specifically designed for Class I and Class III. Off-highway vehicles are allowed on designated routes and areas only. Non-street legal motorcycles and ATV's are only permitted on mixed use roads. All other roads are closed.

North Millican Valley OHV Area is part of the Deer Winter Range and therefore is closed from December 1 through April 30. During the summer, hot, dry conditions may close the area due to extreme fire conditions.

The Millican Plateau is located on the Prineville District of the BLM. The Plateau provides a variety of desert riding experiences from easiest to more difficult. There are 111 miles of trails for Class I and III OHV's, of which 37 miles are also open to Class II OHV's. There are three staging areas with portable toilets and information kiosks providing maps and information for riders. Non-street legal vehicles are only permitted on mixed use roads. The soils are mostly sand with rock outcrops and the vegetation is a mixture of sagebrush and juniper. The Millican Plateau is open for riding year round. During the summer, hot, dry, dusty conditions may inhibit riding. The best riding season is during the winter when there is good ground moisture. There are only a couple of weeks during the winter when the trails are not rideable due to snow or frost.

South Millican lies south of Highway 20 about 22 miles east of Bend on the Prineville District of the BLM. It provides 43 miles of trails ranging in difficulty from easiest to more difficult. South Millican is an ancient lake bed so the terrain is flat to rolling hills with sagebrush, grasses and widely scattered juniper trees for vegetation. The soils are very sandy with rock outcrops and the best riding is in the fall when there is moisture. Elevation ranges from 4200-4500 feet. Three trailheads provide parking and staging areas. All trails are well signed and mapped.

The trail system provides opportunities for Class I, Class II, and Class III ATVs. About 32 miles of trails are specifically designed for Class I and Class III ATVs the remaining 11 miles are open to Class II OHV's as well as Class I & III. Off-highway vehicles are allowed on designated routes and areas only. Non-street legal vehicles are only permitted on Mixed use Roads. South Millican Valley is open August 1 through November 30. It is closed the rest of the year to protect sage grouse. During the late summer months, it may also close due to extreme fire conditions. Hot dusty conditions may inhibit riding in the late summer as well.

The Millican/ODOT Pit is located east of Millican on Highway 20 in an Oregon Department of Transportation gravel pit. The play area is designed for Class I and Class III ATV's and provides challenges for riders at all levels of experience. There is ample parking space for vehicles towing trailers and camping. A kiosk keeps riders informed of regulations and closures as well as providing maps of nearby OHV trail systems. A chemical toilet is on site. The site also serves as a staging area for access to North Millican OHV Trail System and Millican Plateau OHV Trail System. The Millican/ODOT Pit is open all year but dry, dusty conditions may inhibit use during the late summer months. Likewise, snow in the winter may discourage winter riding.

LaPine Area Designated OHV Trail System

The Rosland Play Area designed for Class I and Class III ATV's is located just north of Lapine at Wickiup Junction. The area consists of 3.5 miles of loop trails on a wooded flat, a learners' loop, a beginner play area and an advanced play area. The play area is an excellent spot for young riders to become familiar with their OHVs in the open beginner play area and on the short loop trails. Only spotters and riders are allowed in the play areas so several picnic tables are placed at shaded locations to provide easy observation. There is lots of parking for both pits and easy access for vehicles towing trailers. Two information kiosks keep visitors posted of closures and regulations and also supply visitors with maps. There is a toilet located between the staging areas. The play area is open year round. However, dust and heat may discourage riders from mid-July to September while cold and snow may inhibit them in the winter.

Table 3-72 - Central Oregon Designated OHV Areas

Name	Managing Agency	Location	ATV Classes	Season	Description	Setting
East Fort Rock	Deschutes National Forest	21 miles east of Bend on US 20	I and III, Class II on Mixed use Roads Only	All year, some trails affected by Green Dot Closure in October	318 miles of easy to most difficult trails	Soils range from sandy with rock outcrops and pumice with desert to forest type vegetation
Millican Plateau	Prineville BLM	20 miles NE of Bend on George Millican Road	I, II and III	All Year	111 miles of easiest to more difficult trails; 37 miles open to Class II	Mostly sandy soils with rock outcrops. Vegetation is a mixture of juniper and sagebrush
North Millican	Prineville BLM	24 miles E of Bend off Hwy 20	I, II and III	Closed Dec 1 through April 30	102 miles of easiest to most difficult trails; 24 miles open to Class II	Mostly sandy soils with rock outcrops. Vegetation is a mixture of juniper and sagebrush
South Millican	Prineville BLM	22 miles E of Bend off Hwy 20	I, II and III	Closed Dec 1 through April 30	43 miles of easiest to more difficult trails; 11 miles open to Class II	Mostly sandy soils with rock outcrops. Vegetation is a mixture of scattered juniper and sagebrush
Henderson Flat	Crooked River National Grassland	13 Miles S of Madras	I and III	Closed Dec 1 through March 31	18 miles easiest to more difficult trails, not open to Class II	open juniper vegetation spread over steep to rolling hills and interspersed with red rimrock breaks
Edison Butte	Deschutes National Forest	24 miles SW of Bend	I, II and III	Closed Dec 1 through March 31	25 miles of more to most difficult trails. Restricted to vehicles under 80 inches	loose rocks and lava ridges, vegetation ranges from ponderosa pine and Manzanita to stands of hemlock trees
Green Mountain	Ochoco National Forest	18 miles N of Prineville	I and III	All year – closed by snow annually	8.5 miles of more difficult trail	Open ridge tops, spectacular views, old growth ponderosa pine stands.
Rosland Pit Play Area	Prineville BLM	26 miles S of Bend at Wickiup Jct	I and III	All year	3.5 miles of trails, a learners' loop, a beginner play area and an advanced play area	Large mounds of sandy soil and flat areas surrounded by lodge pole pine forested area.
ODOT Pit Play area	Prineville BLM	27 Miles E of Bend on Hwy 20	I and III	All Year	Open play area provides challenges for all levels of experience	Gravel mounds and flat areas adjacent to North Millican Trail System

Other OHV Areas in Oregon

There are more than 40 designated OHV sites and areas in Oregon managed by several public land management agencies. Given the willingness of OHV users to drive substantial distances to recreate (Bergerson et al 2005), many of those who use the existing routes in the Deschutes and Ochoco National Forests for OHV recreation probably also use these other areas either instead of or in addition to Forest routes. National Visitor Use Monitoring (English, Kocis and Hales 2004) reported substitute choices made by OHV users if they were unable to use National Forest System lands. About 64% of primary OHV users in the Pacific Northwest responded that they would go somewhere else for the same activity.

Selected OHV areas in Oregon are displayed in Table 3-73. Oregon Dunes National Recreation Area, Sand Lake Recreation Areas, Christmas Valley Sand Dunes and other dune areas are not listed in the table because they offer different recreation experiences than the Deschutes and Ochoco National Forests, or the Crooked River National Grassland.

Table 3-73 - Selected OHV recreation sites and areas in Oregon.
Source: <http://atv.prd.state.or.us/places.php>

Name	Managing Agency	Location	ATV Classes	Season	Description
Blue Mountain OHV Trail	Wallowa-Whitman National Forest	8 miles east of Unity on Hwy 26	I and III	Summer and Fall	60 miles of trails
John's Peak	Bureau of Land Management	10 miles west of Jacksonville in southern Oregon	I, II and III	All year	> 14,000 acres of trails with varying difficulty
Morrow County Trails	Morrow County Public Works	20 miles east of Heppner	I, II and III	All year	> 100 miles of trails
Shotgun Creek OHV Area	Bureau of Land Management	East of Springfield	I, II and III	All year	6,000 acres of trails with varying difficulty
Tillamook OHV Area	Oregon Dept of Forestry	State Hwy 6 between Portland and Tillamook	I, II and III	All year	> 100 miles of easy to most difficult trail
Upper Walla Walla	Umatilla National Forest	12 miles east of Milton- Freewater	III	Spring, Summer and Fall	40 miles of trails
Virtue Flat	Bureau of Land Mangement	11 miles east of Baker City	I, II and III	All year	> 5,000 acres of trails with varying degrees of difficulty
West End (Sunflower)	Umatilla National Forest	NE of John Day	I and III	All year	91,000 acres will all degrees of difficulty

Non-Motorized Trail Systems

On the Deschutes, there are roughly 983 miles of forest system trails that are managed exclusively for non-motorized uses (excluding snowmobile, cross-country ski and snowshoe trails). The 351 miles of forest trails that are managed for OHV use are also open to non-motorized uses. Non-motorized trails that are within areas currently open to motorized use off designated routes are increasingly being used by both ATV's and motorcycles. There are 194 miles of non-motorized trail located within areas that are currently open to motorized access off designated routes.(GIS calculation).

On the Ochoco, there are roughly 132 miles of forest system trails outside designated wilderness areas that are managed exclusively for non-motorized uses (excluding snowmobile and cross-country ski trails). The 27 miles of forest trails that are managed for OHV use are also open to non-motorized uses. In addition, there are 38.4 miles of wilderness trails that are available only for hiking and horseback riding. Non-motorized trails that are within areas currently open to motorized use off designated routes are increasingly being used by both ATV's and

motorcycles. There are 46 miles of non-motorized trails located within areas that are currently open to motorized access off designated routes, and an additional approximately 50 miles of equestrian trails created through horse endurance race events that have been historically used by equestrians that are now receiving increasing motorized use.

Recreation Uses

Description of Recreation Resource

Nearly all Forest visitors use motorized vehicles to get to their preferred activities and settings, whether it is a hiking or equestrian trailhead, a fishing spot, or a favorite campsite. For many people, their vehicle is just the mode of transportation used to access their recreational activity. For others, the vehicle use itself is the activity.

National Visitor Use Monitoring (NVUM)

The National Visitor Use Monitoring (NVUM) program provides reliable information about recreation visitors to national forest system managed lands at the national, regional, and forest level. NVUM information assists Congress, Forest Service leaders, and program managers in making sound decisions that best serve the public and protect valuable natural resources by providing science based, reliable information about the type, quantity, quality and location of recreation use on public lands.

For the Deschutes National Forest, the 2001 NVUM revealed that there are approximately 3,109,377 recreation visits to the Forest each year (Kocis, English et al 2003). A description of visitor activities was compiled from the survey. During their visit to the forest, the top six recreation activities of visitors were hiking/walking, relaxing, viewing wildlife, viewing natural features, fishing, and downhill ski/snowboarding. Each visitor also picked one of these activities as their primary activity for the current recreation visit to the forest. The top primary activities were downhill snowboarding, fishing, hiking/walking, relaxing, and viewing natural features (see Table 3-74).

For the Ochoco National Forest, the 2000 NVUM revealed that there are approximately 568,662 recreation visits to the Forest each year (Kocis, English et al 2001). The first round of NVUM surveys for the Forest was conducted between January 1, 2000 and September 30, 2000. A description of visitor activities was compiled from the survey. During their visit to the forest, the top five recreation activities of visitors were viewing wildlife/nature, viewing scenery, primitive camping, fishing, hiking/walking. Each visitor also picked one of these activities as their primary activity for the current recreation visit to the forest. The top primary activities were, developed camping, viewing wildlife/nature, hunting, horseback riding, and general relaxing (see Table 3-74).

Table 3-74 - Deschutes and Ochoco National Forest activity participation and primary activity (NVUM) and national user participation (NSRE) in comparable recreation activities. [52]

Activity	% Participating (NVUM)		% As Main Activity (NVUM)		National User Participation	
	DES	OCH	DES	OCH	%All Users Participation (NSRE)	% All OHV Users (NSRE)
Backpacking	3.03	2.83	1.02	1.96	11.4	19.9
Bicycling	7.21	5.29	2.43	1.7	22.0	34.4
Cross-country Skiing	2.97	0.23	2.19	0.23	4.8	6.7
Day Hiking	38.28	19.37	10.88	3.28	35.4	47.9
Developed Camping	12.84	19.73	1.07	12.76	29.1	44.7

[52] NVUM data source is the first round of National Visitor Use Monitoring surveys (Kocis, English et al 2003). NSRE data source is 1999-2007 survey information for the National Survey on Recreation and the Environment (Cordell, Betz, Green and Stephens 2008). "No data" indicates that there was no direct cross-walk between NVUM and NSRE. "+" indicates that the activity participation rate is higher than indicated because of participation in variations of the activity that were reported separately. "*" indicates that activity was not shown on the 2000 activity participation list. "**" In the 2000 activity participation list picnicking and Family Gathering were lumped together as one category.

Activity	% Participating (NVUM)		% As Main Activity (NVUM)		National User Participation	
	DES	OCH	DES	OCH	%All Users Participation (NSRE)	% All OHV Users (NSRE)
Downhill Skiing	22.9	0	21.88	0	9.2	14.8
Driving for Pleasure	19.6	16	0.44	1	59.1	86.3
Family Gathering Outdoors	**	**	**	**	76.2	84.9
Fishing	24.62	24.7	14.59	6.49	24.5+	44.6+
Gathering Forest Products	3.82	8.39	0.71	0.76	32.5	52.0
Horseback Riding	0.8	18.15	0.31	14.57	8.7	16.8
Hunting	3.34	22.59	0.77	18.8	10.0+	28.4+
Motorized Water Activities	8.37	0.12	0.53	0.04	28.5+	46.9+
Nature Center Activities	9.03	1.31	0.15	0.10	61.8	69.5
Nature Study	3.78	9.86	0.14	0.03	no data	no data
Non-motorized Water	4.53	0.08	1.4	0	11.2+	21.4+
OHV Use	2.47	3.35	1.06	0	19.0	100.0
Other Motorized Activities	0.21	0.02	0	0	no data	no data
Other non-motorized	4.2	0.87	0.66	0.13	no data	no data
Picnicking	8.67	19.03**	0.22	3.13	58.9	65.2
Primitive Camping	4.31	26.89	0.36	10.21	17.8	17.8
Relaxing	37.42	16.29	6.43	2.95	no data	no data
Resort Use	5.33	0	0.5	0	no data	no data
Snowmobiling	1.18	0.76	0.82	0.68	4.3	4.3
Sightseeing	*	35.44	*	4.98	58.5	58.5
Viewing Natural Features	39.78	58.53	11.45	14.5	66.5	66.5
Viewing Wildlife	37.09	59	1.32	14	51.4	51.4
Visiting Historic Sites	7.26	2.71	0.09	0	51.5	51.5
Walking for Pleasure	*	*	*	*	86.2	86.2

Table 3-75 –Secondary activities reported by primary OHV users in the Pacific Northwest Region of the Forest Service.[53]

Activity	% of Primary OHV Users
Developed Camping	49.85
Primitive Camping	5.96
Viewing Wildlife	24.42
Viewing Natural Features	46.22
Visiting Historic Sites	0.04
Relaxing	46.46
Fishing	1.99
Hunting	0.03
Driving for Pleasure	16.74
Hiking/Walking	20.40
Gathering Forest Products	9.54

Dispersed Recreation Uses

Highly popular dispersed recreation activities include camping, fishing, hunting, (non-commercial) gathering forest products such as antlers, mushrooms, cones, etc., and driving Forest roads for wildlife viewing, or viewing natural scenery.

[53] Data source is the first round of National Visitor Use Monitoring surveys (English, Kocis and Hales 2004).

Many visitors prefer a more secluded experience than what developed campgrounds and picnic areas offer. The many roads, meadows, creeks, ponds, and lakes found on both Forests offer extensive opportunities for dispersed car and trailer camping and picnicking. Many sites have existed for years, and have been used by the same family year after year. Some of these sites are being accessed off of roads that have been administratively closed, but have not been physically closed on the ground, and may not be posted as closed, so appear to be "open".

Dispersed Camping and Day Use Picnicking

On the Deschutes National Forest, dispersed camping and day use picnicking account for approximately 13% of overall participation (2001 NVUM). (see Table 3-74). On the Ochoco National Forest, dispersed camping and day use picnicking are very popular activities and accounted for approximately 46% of overall participation on the Forest . Approximately 27% of those forest visitors participated in primitive (dispersed) camping as either a secondary, or primary activity (see Table 3-74). (Kocis, English et al 2001).

Motorized access off designated routes to dispersed campsites could cause resource damage, especially in sensitive riparian areas, if not posted closed. In the Deschutes River Wild & Scenic River corridor, motorized access off designated routes is limited to designated sites only (designated by signing). There have been other efforts Forest wide to reduce resource impacts by restricting motorized access off designated routes to dispersed campsites by defining where vehicles can park through use of either rock or bollard barriers.

Big Game Hunting

Hunters use vehicles extensively to access campsites, scout for game, and retrieve game. The ability of ATV's to go nearly anywhere impacts wildlife and also the hunting experience of hunters using more traditional methods of access, such as foot, or horses. There is a division between many hunters, some who believe their hunting success rate and experience are improved in areas where use of motorized vehicles is limited and others who do not agree and promote hunting with motorized vehicles.

On the Deschutes National Forest, big-game hunting is fairly popular during designated hunting seasons. The 2001 NVUM (see Table 3-74). for the Deschutes National Forest showed that approximately 3.34% of forest visitors participated in hunting as either a secondary or primary activity.

On the Ochoco National Forest, big-game hunting is a highly popular activity, and the Forest. is a regionally popular destination for big-game hunting. The 2000 NVUM for the Ochoco National Forest showed approximately 22.6% of forest visitors participated in hunting as either a secondary or primary activity and that hunting was among the top five primary activities on the Forest at 18.8% participation (see Table 3-74). (Kocis, English et al 2001).

With the extensive network of roads, and the motorized trails on both Forests and Grassland, there is a tremendous variety of options to access the Forest within a short distance from an open designated road or motorized trail (see Table 3-76)

Table 3-76– Deschutes and Ochoco Forest Acres within ½ Mile of Open Road

Forest	Forest Acres Outside of Wilderness	Acres within ½ Mile of Open Roads	% of Land Within ½ Mile of Open Roads
Deschutes	**1,429,767**	**1,258,860**	**88%**
Ochoco	**688,326**	**572,345**	**83%**

OHV Use Data / Motorized Rec Preferences

As stated earlier in this report, NVUM reported on substitute choices made by OHV users if they had been unable to use National Forest System lands. About 64% of primary OHV users in the Pacific Northwest Region (R6)

responded that they would have gone somewhere else for the same activity (English, Kocis and Hales 2004). The survey did not ask respondants to specify what locations they would have visited instead.

The 2004 Oregon Statewide Motorized Trail Use Survey revealed that OHV enthusiasts are willing to travel reasonably long distances to pursue their most frequent activity (Bergerson et al 2005). The median distance traveled to reach an OHV riding opportunity falls in the range of 41 and 50 miles, and nearly one-fifth of OHV users travel more than 100 miles. Considering only OHV opportunities on National Forest system lands, the median distance traveled is over 200 miles (English, Kocis and Hales 2004).

Off Highway Vehicle Use in Central Oregon

National Visitor Use Monitoring (NVUM) findings support the Deschutes National Forest niche statement position that the Forest was not a major provider of OHV recreation in the year surveyed (see *Table 1 - Deschutes National Forest activity participation and primary activity (NVUM) and national user participation (NSRE) in comparable recreation activities*, English, Kocis and Hales 2003). The first round of NVUM surveys for the Forest was conducted between October 1, 2001 and September 30, 2002. The NVUM survey and report does not describe visitor uses in specific areas within the forest. Statistics are only valid at the Forest level. The survey found that 1% of all recreation visits that year were primarily for OHV use. This percentage equates to roughly 31,095 visits during 2001/2002.

A somewhat larger percentage of Deschutes National Forest visitors indicated they participated in OHV recreation even if it was not their primary reason for visiting the forest. The total percentage of visitors that reported OHV use as a primary or secondary activity was 2.47% of all visits, or roughly 76,802 visits. Although, the East Ft. Rock OHV trail system is a popular destination for many OHV users, overall use is considerably below the average percent participation for Oregon overall (22.2% participation) as reported in the National Survey on Recreation and the Environment (Cordell, Betz, Green and Stephens 2008).

For the Ochoco National Forest and Grassland, National Visitor Use Monitoring (NVUM) findings also support their Niche statement position that the Forest was not a major provider of OHV recreation in the year sampled (see English, Kocis and Hales 2001). The first round of NVUM surveys for the Forest was conducted between January 1, 2000 and September 30, 2000. The NVUM survey and report does not describe visitor uses in specific areas within the forest. Statistics are only valid at the Forest level. The survey found that there were no recreation visits that year that were primarily for OHV use.

A higher number of Ochoco National Forest and Grassland visitors indicated that they did participate in OHV recreation, but it was not their primary reason for visiting the forest. The total percentage of visitors that reported OHV use as a primary or secondary activity was 3.35% of all visits, or roughly 19,900 visits. These data are considerably below the average percent participation for Oregon overall (22.2% participation) as reported in the National Survey on Recreation and the Environment (Cordell, Betz, Green and Stephens 2008).

In terms of the number of primary OHV user visits, the Deschutes National Forest ranks towards the lower end out of twenty Forest Service administrative units in the Pacific Northwest Region. Considering both primary and secondary percentages, the Deschutes ranks slightly lower than middle. The Ochoco and Grassland rank in the bottom 3 Forests with no primary visits out of the same twenty administrative units. Considering both primary and secondary percentages, the Ochoco and Grassland rank near the middle.

The percentage of forest visitors that report OHV use as their primary (or as their secondary) use in the Deschutes National Forest is about equal to the national average (English, Kocis and Hales 2004). The percentage of forest visitors that report OHV use as their primary (or as their secondary) use in the Ochoco National Forest is slightly higher than the national average (English, Kocis and Hales 2004). Nationally, about 2.5% of the 205 million annual recreation visits to National Forests have participating in OHV use as their primary activity. A slightly higher percentage (3.1%) has OHV use as a secondary activity (see Table 3-74).

MOTORIZED RECREATION TRENDS

A recent study (Outdoor Industry Foundation, 2006) estimated that 72% of Americans aged 16 and older participated in an outdoor activity in 2005, with hiking, running and bicycling on trails being three of the most frequently reported activities. Trail use by motorized recreational vehicles is also growing in popularity. All-terrain vehicles (ATVs) entered the recreation and tourism marketplace in the early 1970s and, since then, ridership has grown rapidly. The Specialty Vehicle Institute of America (SVIA) estimates that ATV sales increased over 280% nationwide in the US since 1994 (SVIA, 2006). ATV recreation participation is expected to continue to increase across the US through 2015 (Cordell, Betz, Green, & Owens, 2005). Within Oregon, the Oregon Parks and Recreation Department (OPRD) sells approximately 10,000 OHV stickers annually.

Based on the initial data of the Central Oregon Off-Highway Vehicle Use Study conducted by Virginia State University during 2008 East Fort Rock has the highest use levels for OHV recreational purposes, and the Millican Valley is second.

Table 3-77 Central Oregon Off-Highway Vehicle Use Study Data

Henderson Flat areas	29.4%
East Fort Rock areas	63.5%
Millican	44.8%
Meadow Lakes	3.4%
Edison Butte	8.3%
Oregon Dunes NRA	31.6%
Sand Lake	18.1%

Seventy-seven percent of the visitors are returning users to Central Oregon OHV trails. Seventy percent of the visits stay overnight and average a 3 day trip. Thirty percent make day use trips averaging a 6 hour day. In a typical year, 12 days were spent recreating in Central Oregon, 24 days at other OHV areas. The average miles traveled from the primary residence to this area was 129 miles.

The composition of the various groups visiting the area was 42% friends, 30% family and friends, 24% family, 3% single and 1½% organized clubs or organizations. Forty one percent of the visitors were 31-40 years old.

Table 3-78. Demographic Visitation Data.

20 or younger	21 – 30 years	31-40 years	41-50 years	51-60 years	61 and over
3.1%	15%	40.9%	27.8%	8.8%	4.4%

OHV users enjoy many of the same recreation pursuits as the American population as a whole. Three of the top five most popular recreation pursuits in this country are common to the entire population including OHV users. According to Cordell et, al (2008) the recreation activities with the highest percent participation nationally in the total population are walking for pleasure (developed setting), family gatherings outdoors, viewing and photographing natural scenery, visiting nature centers, and driving for pleasure. The recreation activities with the highest percent participation among all OHV users nationally, are walking for pleasure (developed setting), driving for pleasure, family gatherings outdoors, sightseeing, and viewing/photographing natural scenery (Cordell, Betz, Green and Stephens 2008). These data are displayed in Table 3-74 for the purpose of comparing Deschutes and Ochoco National Forest visitor participation against National visitation.

Primary OHV users also participate in a variety of other recreation activities during their forest visit (English, Kocis and Hales 2004). In R6, the most popular secondary activity for primary OHV users is developed camping (Table 3-75) Relaxing and viewing natural features also had high participation rates.

Cordell reports on the remarkable growth of OHV use in the United States. At the time of the first U.S. National Recreation Survey in 1960, OHV recreation was not included as a reportable activity (Cordell et, al 2008). OHV use today, however, is among the fastest growing outdoor activities. Nationally, the number of people (16+ years of age) who report participating in OHV sports is over 44 million (Table 3-75). Annual OHV sales more than tripled between 1995 and 2003 (sales have leveled off since 2003). Total OHV ownership of newly purchased and previously purchased machines increased 174% between 1993 and 2003, from fewer than three million to more than eight million vehicles. ATV's account for about 70% of all OHVs, not counting full-size, 4-wheel drive vehicles (Cordell 2008).

Based on survey data and sales trends, Cordell predicted that there could be as many as 9.8 million ATVs and off-road motorcycles in the US in early 2008 (Cordell 2008).

Motorized Recreation Preferences

In Oregon, ATV riding (3 and 4 wheel) is by far the most popular type of OHV use, reported by 40% of OHV users as their favorite activity (Bergerson et,al 2005). Seventy percent of Oregon households that participate in OHV sports report that they rode an ATV in 2004 (see Table 3-79) Many households participate frequently. The State survey did not ask how many individuals in the household participated in each activity, so no figure for total participation is estimated by this source.

Off-road motorcycling is reported to be the favorite activity by 25% of OHV users. Eleven percent and 8% of OHV users favor four-wheel driving with stock vehicles and four-wheel driving with modified vehicles, respectively. Modified 4WD vehicles have modified tires and/or suspension upgrades.

Based on observation, and anecdotal data samples, user preferences on the Deschutes and Ochoco National Forest are similar to the state survey data results.

Table 3-79 - Frequency of motorized trail participation in Oregon among households reporting OHV participation.[54]

Activity	Participated in Last Year (percent)	Estimated Oregon Households	Of Participants in Last Year, How Often? (percent)			
			Weekly	2-3/ Month	Once/ Month	Less Often
ATV Riding (3 & 4 wheel)	70	68,600	12	34	19	34
Off-road motorcycling	44	43,100	16	29	20	35
4-wheel driving (stock)	44	43,100	21	24	24	31
4-wheel driving (modified)	29	28,400	21	21	33	24

The Oregon Statewide Motorized Trail User Survey also asked OHV users about trail difficulty preferences. Fifty-one percent of respondents prefer "more difficult" trails. Twenty-eight percent prefer "most difficult" trails. Twenty-one percent prefer "easier" trails.

Information obtained from the Oregon Parks and Recreation Department indicates that OHV use rapidly gained popularity. In 1997, there were 3.9 million all-terrain vehicles (ATVs) nationally and two million off highway motorcycles (OHMs). In 2002, there were 800,000 ATV sales and 300,000 OHM sales, almost 2,200 ATVs per day. During this period, sales increased 171% in the western states. The overall 3rd quarter 2008 Motorcycle sales figures reported include motorcycles, scooters and ATVs. Total sales year to date (YTD), from January to September of 2008 were down 10.7% compared to 2007, brought down by another 25% decrease in ATV sales.

[54] **Data is from the 2004 Oregon Statewide Motorized Trail User Survey. N = 196.**

ATV sales have dropped approximately 25% each quarter this year when compared to 2007. Dual sport sales were up 29.4%, proving that this segment remains extremely popular with American motorcyclists. Sales were 39,805 YTD compared to 30,759 by Q3 of 2007. Off highway motorcycle sales continue to suffer; down 24.9% YTD with 114,174 sold YTD compared to 152,086 by the end of Q3 in 2007.

Comparing December 2007 to December 2006, sales of off-road bikes were down 27.7%; street bikes were down 19.7%; scooters were down 21.1% and all motorcycle categories combined were down 23.2%. ATV sales were also off 28.3% (webBikeWorld).

In July 2007 Dave Crocker of Power Products Marketing reported that US sales of traditional brand ATVs were currently in their third consecutive year of decline. While some analysts might attribute this to the increasing number of Chinese imports that have flooded the market in recent years, it has also become apparent that another trend is having a significant impact on ATV sales.

Over the last three years an increasing number of older buyers are trading in their ATVs and opting for the more appealing utility vehicles or "side-by-side vehicles" as they are often called. Surveys conducted by Power Products Marketing indicate that as much as 10% of annual ATV sales are lost to competing utility vehicles. (Power Products Marketing, Dave Crocker July 2007).

Non-motorized Recreation Trends

Non-motorized recreation continues to be one of the most popular categories of recreation throughout the state and within the local region. National Visitor Use Monitoring (NVUM) findings show that most visitors participate in non-motorized activities (English, Kocis and Hales 2003). A description of visitor activities was compiled from the survey.

On the Deschutes National Forest, the top six recreation activities of visitors were hiking/walking, relaxing, viewing wildlife, viewing natural features, fishing, and downhill ski/snowboarding. Each visitor also picked one of these activities as their primary activity for the current recreation visit to the forest. The top primary activities were downhill snowboarding, fishing, hiking/walking, relaxing, and viewing natural features. (see Table 3-74)

The 2000 NVUM for the Ochoco National Forest supports the popularity of non-motorized recreation on the Forest (Kocis, English et al 2001). The top five recreation activities of visitors were viewing wildlife/nature, viewing scenery, primitive camping, fishing, hiking/walking. Each visitor also picked one of these activities as their primary activity for the current recreation visit to the forest. The top primary activities were, developed camping, viewing wildlife/nature, hunting, horseback riding, and general relaxing

Table 3-80 - Trends in number of people participating and number of participation days for selected outdoor recreation activities in the United States, 1999-2008.[55]

Activity	Total U.S. Participants (1,000s), 2005-2008	Percent Change in Participants, 1999-2001 to 2005-2008	Total Annual Participant Days (millions), 2005-2008	Percent change in Total Days, 1999-2001 to 2005-2008
Developed Camping	52,021	2.7	532.3	9.3
Primitive Camping	33,330.2	-2.0	310.4	12.1
Backpacking	22,077.0	-0.6	277.7	24.0
Picnicking	115,836.2	-1.4	779.7	-17.2
Viewing Natural Scenery	145,489.2	14.1	11,482.3	60.5
Visiting Historic Sites	92,920.8	-4.5	590.8	-15.2

[55] Excerpted from Cordell, Betz et al 2008. Source: NSRE 1999-2001 (n=52607) and 2005-2008 (n=19,186). Note: 1999-2001 participants based on 214.0 million people age 16+ (2000 Census). 2005-2008 participants based on 230.0 million people age 16+ (2006 Census estimate). Missing data indicate that either participation or annual days were not collected during that time period.

Activity	Total U.S. Participants (1,000s), 2005-2008	Percent Change in Participants, 1999-2001 to 2005-2008	Total Annual Participant Days (millions), 2005-2008	Percent change in Total Days, 1999-2001 to 2005-2008
Nature Center Activities	127,406.5	5.0	1,044.0	23.2
Drive Off-road	44,231.3	18.6	1,349.6	56.1
Driving for Pleasure	111,069.0	3.1	2,637.3	-1.1
Snowmobiling	8,328.2	-29.7	92.7	-27.4
Day Hiking	74,032.5	6.8	1,993.4	-20.9
Horseback Riding (trail)	15,262.6	-8.2	278.3	-35.2
Bicycling	91,225.5	7.7	-	-
Kayaking	12,480.5	63.1	76.1	29.4
Downhill Skiing	15,615.4	-14.8	126.4	-15.7
Cross-country Skiing	4,970.7	-39.2	58.8	-7.8
Gathering Forest Products	71,023.3	16.1	869.3	1.9
View or Photograph Birds	81,119.9	19.3	8,039.0	37.6
Viewing Other Wildlife	114,792.0	21.3	5,341.6	46.9
Mountain Climbing	11,811.2	-12.5	104.1	20.5
Visit a Wilderness	70,591.9	3.0	1,108.6	12.8

Some quiet recreation activities show strong growth, and they are predicted to become even more popular (such as viewing natural scenery, hiking, bicycling, kayaking, viewing wildlife). Other quiet activities are becoming less popular (such as horseback riding, primitive camping, cross-country skiing). Such trends may represent a reordering of priorities (Cordell, Betz et al 2008).

Regional Recreation Trend Projections

The following tables display trends for dispersed recreational activities in the Pacific Region (Washington, Oregon, California, Alaska and Hawaii). Table 3-81. shows a baseline figure of the number of participants in the Pacific Region for each activity, and projected growth index for 2010, 2020 and 2050. Table 3-82 displays the same activities, listing the number of days participated and projected growth indices for the same years.

Table 3-81. Participation in some dispersed recreation activities in the Pacific Region, and projection index for participation in 2010, 2020 and 2050 (Cordell et al. 1999:326-349).

Activity	1995 Participants	2010 Projection index	2020 Projection index	2050 Projection Index
Hiking	10,900,000	1.23	1.34	1.85
Biking	9,800,000	1.19	1.29	1.65
Horseback Riding	2,400,000	1.18	1.29	1.77
Primitive Camping	5,600,000	1.13	1.23	1.44
Fishing	7,500,000	1.12	1.20	1.38
Hunting	1,700,000	0.85	0.79	0.64
Developed Camping	8,800,000	1.19	1.32	1.73
Off-Road Driving	4,700,000	1.10	1.20	1.33
Picnicking	15,800,000	1.2	1.31	1.63
Sightseeing	18,500,000	1.26	1.42	1.87
Wildlife	16,700,000	1.23	1.37	1.77

Activity	1995 Participants	2010 Projection index	2020 Projection index	2050 Projection Index
viewing/photography				

The projection index represents the percent increase in the number of participants expected for that activity for a specific decade in Table 3-81 and the percent increase in the total number of days participated attributed to the activity in the Pacific Region in Table 3-82 . Multiplying the projection index with the 1995 baseline gives the projected growth in participation and the projected growth for the total number of days of dispersed recreation anticipated for a given activity.

Table 3-82 Number of days of some dispersed recreation activities in the Pacific Region, and projection index for participation in 2010, 2020 and 2050 (Cordell et al. 1999:326-349).

Activity	1995 Participants - Days	2010 Projection index	2020 Projection index	2050 Projection Index
Hiking	192,800,000	1.20	1.31	1.62
Biking	400,900,000	1.16	1.24	1.55
Horseback Riding	76,700,000	1.10	1.21	1.70
Primitive Camping	57,500,000	1.26	1.46	2.08
Fishing	119,100,000	1.16	1.25	1.44
Hunting	36,000,000	0.95	0.96	0.81
Developed Camping	92,900,000	1.23	1.39	1.88
Off-Road Driving	98,900,000	1.09	1.13	1.42
Picnicking	180,400,000	1.21	1.35	1.62
Sightseeing	363,500,000	1.38	1.67	2.59
Wildlife viewing/photography	838,000,000	1.33	1.58	2.14

The data displayed in Table 3-81 and Table 3-82 represent a subset of all recreational activities covered in this study, and apply to the Pacific Region in general, not just to recreation activities on National Forests. See the study for more details regarding study design, projection parameters and assumptions (Cordell et al. 1999: 326-349).

Recreation data for the Pacific Region found in these studies displays trends that could be expected for visitation on the Deschutes and Ochoco National Forests in the coming decades. According to these projections, sightseeing, followed by non-consumptive wildlife activities like bird watching, wildlife viewing and photography will account for the most recreation use in the future, with picnicking, hiking, biking, developed camping, fishing, primitive camping, off-road driving, horseback riding, and hunting following. This data also indicates that people participating in non-consumptive wildlife activities spend more days participating in their activity than do other recreationists. Heavy growth in the demand for sightseeing (87% increase by 2050), hiking (85% increase by 2050), and non-consumptive wildlife activities (77% increase by 2050) could be expected. The demand for off-road driving is projected to increase by about 20% by 2020. The data suggests the demand for activities that favor semi-primitive non-motorized settings both summer and winter will be heaviest in the future, competing with an also growing demand for semi-primitive motorized settings for off-road vehicle use. It is important to note that recreationists often participate in more than one activity during any given outing, and could be represented more than once in the preceding data.

A study completed by the Forest Service in 2002 surveyed the American public regarding their values with respect to public lands, objectives for management of public lands (including recreation management) and beliefs about the role the Forest Service should play in fulfilling those objectives. The study concludes that the public

sees the promotion of ecosystem health and the protection of watersheds as important objectives. When queried specifically about recreation opportunities, the public supports multiple uses, but not all uses to the same degree. The study found that providing access to additional motorized recreation opportunities was not a high priority objective, while preserving the opportunity to have a "Wilderness experience" was important. Providing opportunities and facilities for non-motorized recreation was seen as a somewhat important objective and role for the agency. Separating these often conflicting types of pursuits (motorized and non-motorized uses) by designating trails for specific uses was seen as a somewhat important objective (Shields et al. 2002)

Environmental Effects

Motorized Access Not Affected by the Proposed Action

There are some past decisions about motorized access that would not be affected by this proposed action. Past administrative decisions that have established seasons of use for specific areas (not including proposed Forest Plan amendments), designated motorized routes (roads and trails) or areas, or closed or decommissioned Forest roads would not be changed by any alternatives considered within the scope of this proposed action. The Travel Management Rule allows for some exclusion or exemptions for motorized access, such as over snow or water, as otherwise authorized by permit, and for administrative or emergency access that are not affected by this decision.

Developed Recreation Sites

On the Deschutes and Ochoco National Forests, motorized access to developed sites would not be affected by the decisions considered here. Management of these sites would remain the same. Motorized access for dispersed camping would continue to be prohibited within ¼ mile of all developed campgrounds on the Deschutes. The developed sites that allow OHV's on the Deschutes (China Hat Campground, Edison and East Ft. Rock OHV Staging areas and Trailheads) would continue to allow OHV use. The developed sites that allow OHV's on the Ochoco (Green Mountain Trail and Henderson Flat Staging Areas and Trailheads) would continue to allow OHV use.

Designated Routes and Areas Open to Motorized Access

On the Deschutes National Forest, there are approximately 6,132 miles of existing designated roads, 343 miles of existing designated motorized trails (East Ft. Rock and Edison Trail systems), and approximately 915[56] acres of designated areas included in existing designated motorized trail systems that are currently open to motorized access by either highway or non-highway-legal vehicles or both. On the Ochoco National Forest, there are approximately 1,892 miles of existing designated roads, and 26.5 miles of existing designated motorized trails (Green Mountain Trail, and Henderson Flat Trail system). Designated motorized trail systems have established specific classes of non-highway-legal vehicles that are allowed on motorized trail systems. These designations would not be affected by this decision.

Areas with Seasonal Motorized Uses

On both the Deschutes and Ochoco National Forests, seasonal use periods for motorized access on designated roads have been established across the two Forests by past administrative actions to protect a variety of resources or to provide quality hunting experiences. With the exception of minor seasonal use period adjustments included in the proposed Forest Plan Amendments, existing seasonal use periods on designated routes would not be affected by this decision.

[56] Because the actual area of these sites is geographically small, they are represented on the maps and in the calculated acres based on a ¼ mile circle that is roughly in the location of the areas currently open to motorized access off designated routes within existing designated trail systems. This may represent a larger area than is actually designated on the ground and is only meant to illustrate the general location of the sites and relative acreage. Detailed maps of the designated motorized trail systems are available that more accurately depict the designated areas of the campgrounds, staging and other open areas within the current designated motorized trail systems.

Motorized Access off Designated Routes

Areas Closed to All Motorized Access

There are approximately 198,908 acres on the Deschutes and approximately 74,465 on the Ochoco National Forest that currently prohibit all motorized access that would not be affected by this decision.. This does not include all of the acres currently closed to motorized access on the Ochoco. Approximately 13,525 acres along McKay Creek are under a temporary public motorized use restriction that would be modified by the proposed action. Areas that would not be affected by this decision are primarily Wilderness Areas, but also include areas where motorized access is restricted or prohibited by other order or past decision and where there are no open designated routes, such as Research Natural Areas and some of the Old Growth Areas on the Ochoco National Forest. These areas are displayed as "Existing – Closed to Motorized Access" on the Alternative 1, 2 and 3 – Motorized Access off Designated Routes maps; and on the Alternative 1 and 2 – Motorized Access for Dispersed Camping maps.

Areas Closed to OHV Access

There are approximately 59,412 acres on the Deschutes National Forest that currently prohibit off-highway vehicle use on and off of designated motorized routes. Forest Plan direction that currently specifically prohibits OHV use within a particular management would not be affected by this decision. The Ochoco National Forest does not have any areas closed specifically to OHV's.

Areas Closed to Motorized Access Off Designated Routes

There are approximately 729,187 acres on the Deschutes National Forest, approximately 204,081 acres on the Ochoco National Forest, and 77,546 acres on the Crooked River National Grassland that currently prohibit motorized or off-highway vehicle access off designated routes or within specific areas that would not be affected by this decision.

Dispersed Recreation

There are approximately 202,727 acres on the Deschutes National Forest , 31,665[57] acres on the Ochoco National Forest, and 77,546 acres on the Crooked River National Grassland that are currently and would remain closed to motorized access for dispersed camping and other dispersed recreation activities that would not be affected by this decision.

Non-Motorized Recreation Use and Non-Motorized Trails

There are approximately 729,187 acres on the Deschutes National Forest that currently prohibit all motorized access that would not be affected by this decision and would continue to provide non-motorized recreation opportunities. There are roughly 898 miles of forest system trails managed exclusively for non-motorized uses (excluding snowmobile and cross-country ski trails). The 343 miles of forest trails that are managed for motorized OHV use would continue to be open to non-motorized uses. No decisions considered here would have any affect on non-motorized use within these areas or on designated non-motorized trail systems. As stated previously, there are approximately 74,465 acres on the Ochoco National Forest that currently prohibit all motorized access that would not be affected by this decision and would continue to provide non-motorized recreation opportunities. There are roughly 132 miles of forest system trails outside designated wilderness areas that are managed exclusively for non-motorized uses (excluding snowmobile and cross-country ski trails). In addition, there are 38.4 miles of wilderness trails that are available only for hiking and horseback riding. The 26.5 miles of forest trails that are managed for motorized OHV use would continue to be open to non-motorized uses. No decisions considered here would have any affect on non-motorized use within these areas or on designated non-motorized trail systems.

[57] These numbers are calculated from GIS data based on those acres noted on Alternative 2 maps as Continued Existing, Closed to Motorized Access for Dispersed Camping.

Alternative 1

Motorized Access On Designated Routes – Roads

For the Deschutes, and Ochoco National Forests, there would be no direct effects, or indirect effect to recreational motorized access on Forest Service road systems from implementing the no action alternative. Designated roads would continue to be used as they are presently. (see Transportation Section). There would be no immediate changes to roads that allow for mixed uses, although future changes to mixed uses could be implemented with other decisions. There would continue to be 5,362 miles of road on the Deschutes, and 1,648 on the Ochoco open to motorized mixed use, and and 770 miles on the Deschutes, and 244 miles on the Ochoco open to highway legal vehicles only. Use levels should not be affected from displacement as there is no change in continued motorized access off designated routes.

Motorized Access On Designated Routes – Trails

Certain classes of ATVs are permitted on roughly 343 miles of forest trails on the Deschutes National Forest, and roughly 26 miles of forest trails on the Ochoco National Forest.
There would be no direct effects, or indirect effect to recreational motorized travel on Forest Service trail systems on either Forest from implementing the no action alternative. Designated motorized trails would continue to be used as they are presently for the vehicle classes they are designated for. Use levels should not be affected from displacement as there is no change in continued Motorized Access Off Designated Routes.

Motorized Access off Designated Routes

If no action were taken to change motorized access off of designated routes, approximately 625,430 acres on the Deschutes and 431,784 acres on the Ochoco would not prohibit motorized use off designated routes unless resource damage is determined to occur. Indirectly, this is likely to result in a continued increase in unauthorized (also referred to as “user-created”) motorized routes. In 2004 an inventory of these routes was completed in several areas across the two forests. On the Ochoco National Forest, the Central Oregon Motorcycle and Trail Association also has provided locations of where unauthorized motorized trails off designated routes have been created; or where designated NF system roads have been closed but still used by off road enthusiasts. Although these do not represent a comprehensive inventory of unauthorized routes, these inventories illustrate a sample of the kinds and amounts of unauthorized motorized trails that are very likely to continue to be developed if there is no change. In addition, there would continue to be confusion among forest visitors about where or when motorized access is or is not allowed, or for what type of vehicle, and how or where to find that information. Opportunity for motorized access off designated routes would continue, allowing motorized users that prefer off route travel access to those kinds of experiences, including access for hunting, scouting game, game retrieval, and gathering forest products such as antlers, mushrooms, cones, etc. Resource damage from inappropriate motorized uses would continue to occur. Conflicts between motorized and non-motorized users would continue and likely escalate as visitor use increases over time.

Motorized Access for Dispersed Camping

On both Forests, motorized access for dispersed camping, along with other dispersed recreation activities would continue to be allowed as provided for by current laws, regulations, policies, Forest Orders, Forest Plan direction, or site-specific decision. In the Pacific Region, which includes the Deschutes and Ochoco National Forests, the growth rate for primitive camping has been projected to increase by 23% by 2020 (Cordell et al. 1999:326-349 see Recreation Specialist Report). Alternative 1 would continue to allow, unless specifically determined otherwise by a separate decision, motorized access for dispersed camping and other dispersed recreation activities on approximately 1,154,185 acres on the Deschutes National Forest, and 502,236 acres on the Ochoco National Forest either year-round or seasonally. With population increases, over time new motorized access routes would likely be created to either existing or new campsites to accommodate demand, especially in prime areas (near

streams, lakes, or other attractive features). If big game tag limits are increased in any hunt unit, there would likely be an increase in motorized access to new campsites to meet that demand. Sites located greater than 300' from a designated road would still be accessible for motorized vehicles. Resource impacts such as soil compaction and erosion and loss of vegetation would continue to occur and increase with increased use.

Non-Motorized Recreation Use and Non-Motorized Trails

If no action were taken to change motorized access off designated routes and motorized access to dispersed camping, there would continue to be impacts to non-motorized users from noise, dust, exhaust and proximity to motorized uses. This impact would be expected to increase with population increases, and higher Forest visitation. On the Deschutes, there are 194 miles, and on the Ochoco there are 46 miles of non-motorized trails that are currently located within areas open to motorized access off designated routes. It is often unclear to motorized users that these trails are not open to motorized use. These trails located within areas that are open to motorized access off designated routes would continue to receive increased motorized use as they become more indistinguisable from a motorized trail.

Actions Common to Alternative 2 and 3

Motorized Travel on Designated Roads and Trails

On the Deschutes National Forest, approximately 5,181 miles of road would remain available for OHV use (all ATV classes). An additional 951 miles of road would be open only to highway licensed vehicles as provided for by current laws, regulations, policies, Forest Orders, Forest Plan direction, or site-specific decision. On the Ochoco National Forest approximately 1,522 miles of road would remain available for OHV use (all ATV classes). An additional 369 miles of road would be open only to highway licensed vehicles as provided for by current laws, regulations, policies, Forest Orders, Forest Plan direction, or site-specific decision.

There would be a loss of motorized access for non-highway legal vehicles on approximately 181 miles of road on the Deschutes, and approximately 125 miles of road on the Ochoco that would be open only to highway legal vehicles. This results in a change in people's ability to access the forest as they have in the past. People using non-highway legal vehicles may not be able to connect to desired destinations such as favorite destinations, campsites, people's homes, or access to community services, as well as connect to other roads allowing motorized mixed use.

Table 3-83: Expected Change in Roads Open to Highway Legal Vehicles

Forest	Open to HWY Legal Only			Open to Motorized Mixed Use			Open Miles
	Existing	Alt 2,3	Change	Existing	Alt 2,3	Change	
Deschutes NF	770	951	181	5,362	5,181	-181	6,132
Ochoco NF	242	367	125	1,388	1,262	-125	1,630
Crooked River NG	2	2	0	260	260	0	262
Totals:	**1,014**	**1,320**	**306**	**7,010**	**6,703**	**-306**	**8,024**

Motorized Access off Designated Routes

For the Deschutes National Forest, the actions common to both Alternatives 2 and 3 would prohibit motorized access off designated routes on more than 99% of the Deschutes and Ochoco National Forests (approximately 1,353,542 acres on the Deschutes, and 649,181 on the Ochoco). In addition, 198,908 acres would be closed to all motorized access on the Deschutes National Forest, and 87,990 acres would be closed to all motorized access on

the Ochoco National Forest and Grassland. While there would be some areas that would be designated open to motorized access off designated routes, they are relatively small (less than 1%) compared to the total area currently open. These areas consist of approximately 200 acres of existing rock quarries on the Deschutes, and 220 acres on the Ochoco, where current OHV use as a play area would be allowed to continue (see DEIS Chap. 2, p.42 for a detailed description, and the criteria for selection), and the existing play areas (approximately 915 acres) contained within the East Ft. Rock, and an estimated 5 acres[58] within the Henderson Flat OHV Trail Systems.

Under both alternatives, restricting motorized travel to designated roads and trails would provide a more "developed" recreation experience, allowing for faster speeds and less technical challenge for some classes of vehicles. There is expected to be increased use on designated roads and trails with more interaction and potential conflicts, between different classes of motorized vehicles, especially on motorized mixed use roads. Restricting access to designated roads and trails would not provide for more primitive off road recreation opportunities and the landscape settings may be less appealing to those who favor motorized off road experiences. Motorized travel off designated routes has created a network of unauthorized "user created" routes and areas which would not be accessible under these alternatives. These routes and open areas provide a different recreational experience, allowing for the exploration of unknown areas, finding your own technical challenges, and viewing scenery and nature away from others. The roads that are open to non-highway legal vehicles may be fragmented by roads that are open only to highway legal vehicles which would not provide connectivity to desired destinations. The existing designated trail systems that are open to certain classes of off highway vehicles would provide a less developed, and more technically challenging experience depending on the class of vehicle. On the Deschutes, there currently are no designated Class III single track trails favored by many motorcyclists, and only 25 miles of designated Class II routes for jeep type vehicles. On the Ochoco, there currently are no designated Class II routes for jeep type vehicles and no designated Class III single track trails, which are favored by many motorcyclists. Existing roads do not provide the level of challenge or undeveloped motorized experience that many of these users prefer. While any future designated trail systems would be designed to provide different levels of challenge, user discretion to travel off designated routes would be lost.

Motorized Access for Dispersed Recreation

Dispersed Camping

Alternative 2 and 3 would include areas in common that are proposed to be closed to motorized access for dispersed camping that are currently open for this use. This would include a total of about 794,722 acres on the Deschutes National Forest and about 415, 834 acres on the Ochoco National Forest. Most of these prohibitions are outside of the 300' area adjacent to existing open roads where motorized access for dispersed camping is generally proposed to be continued. However, there are some areas that are currently open for motorized access for dispersed camping that would be closed to this use under both Alternative 2 and 3. These areas are illustrated on Alternative 2 – Motorized Access for Dispersed Camping.

Special Provision Areas – Riparian*:* All open designated routes within 300' of a stream, wetland, or water body that did not otherwise prohibit motorized access for dispersed camping were identified as "Special Provision – Riparian Areas." These designations are common between Alternative 2 and 3, and include approximately 19,798 acres on the Deschutes National Forest, and approximately 39,269 acres on the Ochoco National Forest, that would be subject to the special provisions associated with streams, wetlands, or water bodies. These include areas that would be open to motorized access for dispersed camping both year-round and seasonally.

Special Provision Areas – Non-Riparian: Areas proposed for "Special Provision – Non-Riparian," were based on the *Criteria for Identifying Special Provision or Areas Closed to Motorized Access for Dispersed Camping Within 300' of Open Designated Routes.* All of the "Special Provision – Non Riparian" areas identified in Alternative 2 are also included in Alternative 3. On the Deschutes National Forest there are approximately 31,246 acres, and on

[58] Acreage estimated from area was designated.

the Ochoco National Forest there are approximately 15,325 acres that are proposed as, "Open to Motorized Access for Dispersed Camping with Special Provisions – Non-Riparian." These areas would have the same designation in both Alternatives 2 and 3. These include areas that would be open to motorized access for dispersed camping both year-round and seasonally.

Areas Proposed to be Opened to Motorized Access for Dispersed Camping:

Both action alternatives would propose to open some areas to motorized access for dispersed camping that are currently closed to motorized access under existing Forest Order or Forest Plan direction. These areas were temporarily closed to motorized access for dispersed camping as a result of a primary intent to close the area to motorized access off designated routes by non-highway-legal vehicles. These areas may be proposed as "open" to motorized access for dispersed camping under the general provisions of the Travel Management Rule, or "open with special provisions", depending upon the Alternative. Most of these acres occur on the Crooked River National Grassland. There are approximately 35,557 acres on the Deschutes National Forest that are currently closed to motorized access for dispersed camping that would be proposed to be open to motorized access for dispersed camping subject to the general conditions, and approximately 8,354 acres on the Ochoco National Forest, all on the Crooked River National Grassland. (See Table 3-86) These areas are displayed on the Alternative 2 – Motorized Access For Dispersed Camping maps.

Under both Alternatives 2 and 3, it is expected that motorized access to dispersed camping opportunities would still be available either through the general provisions, or special provisions (based on available GIS dispersed campsite data for the Forest) to approximately 70% of the Deschutes National Forest known sites, and an estimated 80% of the known Ochoco National Forest and Grassland sites (based on existing Dispersed Site information in GIS). Motorized access to those sites that are further than 300' from a designated open road would no longer be accessible by motorized vehicles unless a route is designated in the future to access those sites. People using recreation vehicles (RV's) such as trailers, campers, toy haulers, motor homes, etc., would be most affected as they would not be able to access sites beyond 300' with their RV's unlike tent campers who would have the option to walk in to their desired site. The camp sites would still available for public use; however motorized access would be restricted. Within those acres where camping is allowed only under the Special Provisions, it is expected that some people may not be able to access their favorite spot because it is already occupied, which may displace some visitors to other areas. It is expected that those sites that are located within the special provision areas will receive a higher level of use, and that demand will increase with increasing population growth.

Hunting and Gathering

For both Forests, neither Alternatives 2 or 3 provide provisions for motorized access off designated routes for the purposes of hunting, scouting game, game retrieval, or gathering forest products for personal use such as antlers, mushrooms, cones, etc. Motorized access for collection of commercial forest products and wood cutting may continue to be allowed under permit conditions. This would have the highest impact on those that may depend more upon a motor vehicle for access as they would no longer have access off of designated routes to pursue these activities.

Non-Motorized Recreation Use

Non-motorized recreation continues to be one of the most popular categories of recreation throughout the state and within the local region. The proposed action would indirectly beneficially affect forest users that prefer non-motorized access and recreational activities by prohibiting motorized access off designated routes and by prohibiting motorized access for dispersed camping in some areas. Under the Alternatives 2 and 3, on the Deschutes National Forest there would be approximately 258,320 acres that would continue to be closed to motorized access, and an additional 1,354,617 acres where motorized access would be restricted to designated routes only. On the Ochoco National Forest there would be approximately 74,465 acres that would continue to be closed to motorized access, and an additional 649,170 acres where motorized access would be restricted to

designated routes only. This action would result in a 53% increase in the area where non-motorized recreation users could expect reduced encounters or impacts from motorized use. There would be some continued effects from motorized use near roads or designated routes, and where dispersed camping is allowed, either under general or special provisions.

Non-Motorized Trails

On the Deschutes National Forest, there are about 194 miles of non-motorized trail located within areas currently open to motorized access off designated routes. On the Ochoco National Forest there are about 46 miles of non-motorized trail located within areas currently open to motorized access off designated routes. Under Alternative 2 and 3, on both Forests, it is expected that there would be a beneficial effect to use of these miles of non-motorized trail located within areas currently "open" to motorized access off designated routes because there would be reduced motorized access to these trail systems and the potential for inadvertent use of these non-motorized trails by motor vehicles as they become undistinguishable from motorized trails.

Alternative 2 - The Proposed Action

Dispersed Recreation

Alternative 2 would designate some areas as open to motorized access for dispersed camping subject to general provisions only (shown as "continued existing open" or "proposed open" on the Alternative 2 map), in the upland areas. Alternative 2 would also allow motorized access for dispersed camping within Inventoried Roadless Areas under special provision conditions only. Those routes and areas that would be open to motorized access for dispersed camping in Alternative 2 under either general or special provisions are shown on the unit-specific Alternative 2 maps.

On the Deschutes National Forest, in addition to the actions common to Alternatives 2 and 3, creating new motorized routes to access new or existing campsites would be allowed within the 353,686 acres designated as "open to motorized access for dispersed camping[59]" either year round or seasonally within 300'. Motorized access would be restricted to "open to motorized access for dispersed camping with Special Provisions" on 51,044 acres where motorized access would be allowed only to designated, defined, or existing campsites. On the Ochoco National Forest, Alternative 2 would designate approximately 69, 733 acres as "open to motorized access for dispersed camping[60]" either year round or seasonally within 300' of a designated route, and approximately 54,594 acres on the Ochoco National Forest would be "open to motorized access for dispersed camping with Special Provisions", either year round or seasonally.

Alternative 3

Motorized Access On and Off Designated Routes

There would be no change in affects to Motorized access on or off designated routes from actions common to Alternatives 2 and 3.

Dispersed Recreation

Alternative 3 would include all of the actions common to Alternatives 2 and 3. In addition, Alternative 3 would allow for motorized access for dispersed camping only to existing, designated, or defined sites in riparian and upland areas (special provision conditions would apply to all motorized access for dispersed camping adjacent to designated open roads), and would prohibit any motorized access for dispersed camping in Inventoried Roadless

[59] Subject to the "General Provisions" identified earlier in this chapter.
[60] Subject to the "General Provisions" identified earlier in this chapter.

Areas. Those routes and areas that would be designated as "special provision areas" in Alternative 3 are shown on the unit specific Alternative 3 maps.

Alternative 3 would designate approximately 416,580 acres on the Deschutes, and 85,058 acres on the Ochoco and Grassland as open to motorized access for dispersed camping with Special Provisions, either year round, or seasonally.

On the Deschutes National Forest, under this alternative, 997,449 acres would continue to be closed to motorized access for dispersed camping, and on the Ochoco National Forest and Grassland, 525,063 acres would continue to be closed to motorized access for dispersed camping. There would be no Forest acres "open to motorized access for dispersed camping" under only the General Provisions. Motorized access for dispersed camping would be "open to motorized access for dispersed camping with Special Provisions" either year round or seasonally on 404,730 acres on the Deschutes National Forest, and 124,327 acres on the Ochoco National Forest and Grassland. Motorized access would be restricted to only those sites that are designated, defined or existing. Although immeasurable, it is anticipated that Alternative 3 would reduce resource impacts since it is assumed fewer additional motorized routes to access campsites would be created. This Alternative would put additional demand on those sites that can be accessed under the special provisions, especially in areas that traditionally have been heavily used for dispersed camping.

Comparison of Alternatives (from Chapters 1 & 2)

Motorized Access on Designated Routes

Table 3-84- Expected Change in Roads Open to Highway-legal Vehicles

FOREST	Open to HWY Legal Only			Open to Motorized Mixed Use			OPEN Miles
	Existing	Alt 2,3	Change	Existing	Alt 2,3	Change	
Deschutes NF	770	951	181	5,362	5,181	-181	6,132
Ochoco NF	242	367	125	1,388	1,262	-125	1,630
Crooked River NG	2	2	0	260	260	0	262
Totals:	**1014**	**1,320**	**306**	**7,010**	**6,703**	**-306**	**8,024**

Motorized Access Off Designated Routes

Table 3-85- Acres of Motorized Access Off Designated Routes (% of Total Forest Acres)

	Alternative 1		Alternative 2		Alternative 3	
	Deschutes	***Ochoco***	***Deschutes***	***Ochoco***	***Deschutes***	***Ochoco***
Open year-round	543,136 (34%)	189,369 (26%)	1,075 (<1%)	191 (1%)	Same as Alternative 2	
Open Seasonally	82,294 (5%)	242,415 (33%)	0	20 (1%)	Same as Alternative 2	
Closed[61]	987,507 (61%)	292,071 (40%)	1,611,862 (~99%)	723,644 (~99%)	Same as Alternative 2	
Total	**1, 612,937**	**723,855**	**1,612,937**	**723,855**	**Same as Alternative 2**	

Motorized Access for Dispersed Camping

[61] Includes areas currently closed to motorized access off designated routes and areas closed to off-highway vehicles off designated routes.

Table 3-86- Acres of Motorized Access for Dispersed Camping[62] (% of Total Forest Acres)

	Alternative 1		Alternative 2		Alternative 3	
	Deschutes	**Ochoco**	**Deschutes**	**Ochoco**	**Deschutes**	**Ochoco**
Year-round						
Open	962,717 (60%)	246,712 (34%)	306,875 (19%)	53,056 (7%)	0	0
Open to Designated Sites Only	11, 850 (<1%)	0	Same as Alternative 1			
Open with Special Provisions-Riparian	0	0	18,435 (1%)	29,083 (4%)	Same as Alternative 2	
Open with Special Provisions Non-Riparian	0	0	22,304 (1%)	8,899 (1%)	329,179 (20%)	61,955 (9%)
Closed	446,902 (28%)	221,619 (31%)	1,196,357[63] (74%)	599,528[64] (83%)	Same as Alternative 2	
Seasonally						
Open	191,468 (12%)	255,524 (35%)	46,811 (3%)	16,677 (2%)	0	0
Open with Special Provisions-Riparian	0	0	1,363 (<1%)	10,186 (1%)	Same as Alternative 2	
Open with Special Provisions Non-Riparian	0	0	8,942 (<1%)	6,426 (~1%)	55,753 (3%)	23,103 (3%)
Total	**1,612,937**	**723,855**	**1,612,937**	**723,855**	**1,612,937**	**723,855**

Conclusion

Alternative 1

The no action/no change alternative would continue to allow motorized access off designated routes and would likely result in a continued increase in unauthorized "user-created" motorized routes. Impacts to non-motorized users from noise, dust, and proximity to motorized uses would continue and be expected to increase with population growth and higher forest visitation. Non-motorized trails that are located within areas open to motorized access off designated routes would receive increased motorized use as they become more indistinguishable from a motorized trail. There would continue to be confusion among forest visitors about where or when motorized access is or is not allowed, or for what type of vehicle, and how or where to find that information. Conflicts between motorized and non-motorized users would continue and escalate as visitor use increases over time. With population increase, more new motorized routes would likely be created to access either existing or new dispersed campsites to accommodate demand, especially in prime areas (near streams, lakes, or other attractive features). Resource impacts such as soil compaction and erosion and loss of vegetation would continue to occur and increase.

[62] Acreages are coincident with those acres shown in Table 3 – Motorized Access Off Designated Routes, but relate more specifically to where motorized access for dispersed camping is now and would be proposed to be allowed in Alternatives 2 and 3.

[63] Includes approximately 401,635 acres that would remain unchanged as closed to motorized access for dispersed camping, this includes 198,908 acres closed to all motorized access and 202,727 acres currently closed to motorized access for dispersed camping

[64] Includes approximately 183,694 acres that would remain unchanged as closed to motorized access for dispersed camping, this includes 74,465 acres closed to all motorized access and 109,229 acres currently closed to motorized access for dispersed camping

Alternatives 2 and 3

Effects to motorized use would include a loss of access to non-highway legal vehicles to some additional roads that would be open only to highway legal vehicles. There is expected to be increased use on designated roads and trails with more interaction and potential conflicts between different classes of motorized vehicles, especially on mixed use roads. There would be a change in users' ability to access the forest as they have in the past as motorized use would be limited to designated routes. The roads that are open to non-highway legal vehicles may be fragmented by roads that are open only to highway legal vehicles which would not provide connectivity to desired destinations.

Restricting access to designated roads and trails would have a significant impact on motorized users who prefer a more primitive setting and off-road recreation experience. User discretion to travel off designated routes would be lost. Neither Alternatives 2 nor 3 provide provisions for motorized access off designated routes for hunting and gathering purposes. This would have the highest impact on those that may depend more upon a motor vehicle for access as they would no longer have access off of designated routes to pursue these activities.

Under Alternative 2 and 3, restricting motorized access for dispersed camping under the General Provisions, or to designated, defined, or existing sites under the Special Provisions would most affect people using recreation vehicles (RV's) such as trailers, campers, toy haulers, motor homes, etc. These users would not be able to access sites beyond 300' off designated routes with their RV's, unlike tent campers, who would have the option to walk to their desired site. It is expected that some people may not be able to access their favorite spot because it is already occupied. This would displace some visitors to other areas.

Alternatives 2 and 3 would result in a substantial increase in the areas where non-motorized recreation users could expect to not encounter or be impacted by motorized users. It is expected that there would be a beneficial effect for non-motorized users on the miles of non-motorized trail located within areas currently 'open' to motorized access off designated routes because there would be reduced motorized access to these trail systems, and a reduction in the potential for inadvertent use of these non-motorized trails by motor vehicles as they become undistinguishable from motorized trails.

Alternative 3

There would be no change in affects to Motorized Access On or Off designated routes from actions common to Alternatives 2 and 3.

Alternative 3 would include all of the actions common to Alternatives 2 and 3. In addition, Alternative 3 would allow for motorized access for dispersed camping only to existing, designated, or defined sites in riparian and upland areas (special provision conditions would apply to all motorized access for dispersed camping adjacent to designated open roads), and would prohibit any motorized access for dispersed camping in Inventoried Roadless Areas. Those routes and areas that would be designated as "special provision areas" in Alternative 3 are shown on the unit specific Alternative 3 maps.

Although immeasurable, it is anticipated that Alternative 3 would reduce resource impacts and impacts to non-motorized users since it is assumed fewer additional motorized routes to access campsites would be created. This Alternative would put additional demand on those sites that can be accessed under the special provisions, especially in areas heavily used for dispersed camping.

Social and Economic Analysis

Executive Summary

Social and economic elements, which are interrelated and interdependent with ecological elements, comprise the human dimension component of the ecosystem. The purpose of this social and economic analysis is to inform the decision-making process though a discussion of the current social and economic contributions of various types of recreational activities and the potential impacts to the public from the alternatives. The implications of resource management decisions for the Deschutes and Ochoco National Forests to the social and economic uses and values are of interest to residents of the area and users of the area. These people have made their interests known through organized groups and personal efforts. It is these interests, identified through public involvement and comments, that have helped to articulate the social attitudes, beliefs, and values that affect the people that enjoy the two National Forests and Grassland.

The primary area potentially affected by the proposed actions considered in this DEIS are a four-county area that includes Deschutes, Crook, Jefferson, and Klamath Counties. The population of this area, with the exception of the population of Jefferson County, is generally aging when compared with previous census years, is increasingly female, and generally white with mid-level incomes. Low income and minority populations in the area tend to be younger, with higher concentrations in Jefferson, Klamath, and Crook Counties than in Deschutes County. Based on this analysis, there are no anticipated economic or disparate impacts expected to low income, minority, or disabled populations.

Recreation activities classified as primarily non-motorized presently represent both the dominant recreational uses on the two National Forest and economic contributions to the recreation economy of the region. Overall contributions and trends to the local economy from either motorized or non-motorized uses are unlikely to measurably change as a result of any of the alternatives. Although recreation and tourism are becoming a more important part of the economic sector, data suggests that the importance of National Forest lands as an ecological setting is the most important contribution to recreation and tourism economy. Data also suggests that, for the two-forest area, future job-related recreation economic contributions to the communities are higher for non-motorized uses than for motorized uses.

For all alternatives considered in detail, continued motorized access on more than 8300 miles of existing open designated roads and trails that provide motorized access within one-half mile of more than 80% of the two forests would provide an equal amount of motorized access opportunities in all alternatives for people who value primitive motorized exploration and discovery of areas associated with open designated routes on low-use roads or designated motorized trails and people who value motorized access the road and trail system for access between neighborhoods.

Alternative 1 would continue to have approximately 39% of the Deschutes and 60% of the Ochoco National Forests that does not prohibit motorized access off designated routes. This provides the most area potentially available to motorized access off designated routes of the three alternatives, and therefore the most motorized opportunities of the three alternatives for people that value undesignated motorized off-road or trail experiences or who believe that they have a need or right to motorized travel off designated routes and maintain what they believe to be primarily unregulated motorized access. People that value designated designed motorized trail systems believe they would experience a lesser sense of crowding and greater opportunity to experience solitude because of their ability to use unauthorized trails and areas that are not currently closed to motorized access off designated routes.

Alternative 1 would continue to offer primary or exclusive non-motorized access on approximately 61% of the Deschutes and 40% of the Ochoco NF. This alternative would provide the least amount of area closed to motorized access off designated routes of the three alternatives and thus provide the least amount of opportunities of any of the alternatives to people who value peace and quiet away from the sights and sounds of motorized uses. Potential for conflicts for people who believe they cannot enjoy peace and quiet when there is evidence of

motorized use would continue to increase with anticipated increases in motorized uses in areas that currently are not closed to motorized access off designated routes. There would be an increased potential for displacement of people with lower tolerances for conflict from where motorized access off designated routes is occurring to areas of more exclusive non-motorized uses. This could reduce their present and future opportunities for solitude, peace and quiet, and potentially increase crowding in areas of exclusive non-motorized use.

Currently, Approximately 72% of the Deschutes and 69% of the Ochoco NF allows motorized access for dispersed camping year round or seasonally. There is less than 1% of areas adjacent to water that limit motorized access for dispersed camping to designated sites only. Alternative 1 provides the most opportunities of the three alternatives to people who prefer a motorized camping opportunity away from existing designated roads and people who prefer motorized access for dispersed camping within riparian areas

People have varying beliefs about the amount of regulation of motorized access. Signing areas as “closed to motorized access” along with travel management maps would continue to be the primary mechanism of informing people about where motorized access is allowed in Alternative 1. Current trends indicating increasing localized area closures to motorized access off designated routes because of resource or social conflicts could be in conflict with beliefs of largely unregulated motorized access. The presence of signs posting areas closed to various types of motorized access and potential difficulty of predicting where motorized access off designated routes would be allowed is likely to be the highest in this alternative. There would be no change to motorized access off or on designated roads or for motorized access for dispersed camping within Wildland Urban interface areas. Potential disturbance and conflicts adjacent landowners believe are from unregulated motorized access would be highest of the three alternatives.

Alternatives 2 and 3 would tend to result in more concentrated uses on motorized trails and roads than Alternative 1 and could increase crowds and disturbance to motorized users who value solitude. Users who value peace and quiet away from the sights and sounds of motorized uses would experience less conflict and likely less potential for displacement from valued areas because of motorized uses. Only about 1% of the two national forests would be available to motorized access off designated routes. This would eliminate most opportunities on the two forests for people that value undesignated motorized off-road or trail access or who believe that they have a need or right to travel off of designated routes and to maintain what they believe to be primarily unregulated motorized access. People that value and use designated motorized routes and areas could experience a greater sense of crowding on those routes and within those areas and have a reduced opportunity for solitude because of the amount of areas closed to motorized access off designated roads or trails as a result of Alternatives 2 and 3. Depending upon personal tolerance for conflict, some people may be displaced from preferred areas. Alternatives 2 and 3 could result in displacement of people that prefer unregulated motorized access to areas that allow for motorized access off designated routes.

Alternatives 2 and 3 would result in about a 46% reduction on the Deschutes and a 52% reduction in the amount of acres available to motorized access for dispersed camping when compared to Alternative 1**.** This would reduce opportunities when compared with Alternative 1for people who prefer primitive motorized access for dispersed camping more than 300’ from an open designated route. However, samples of the dispersed site inventory, while not comprehensive, indicate 70-80% of all dispersed sites with motorized access are within 300’ of an open designated route or area. Establishing **general** provisions for motorized access for dispersed camping on approximately 22% of the Deschutes and 9% of the Ochoco, and **special provisions** on about 4% of the Deschutes and 7% of the Ochoco and limiting motorized access to within 300’ of open designated roads would continue to provide motorized access for dispersed camping to most existing known sites and offer some opportunities in areas previously closed to motorized access for dispersed camping for people who prefer primitive camping with motor vehicles. Alternatives 2 and 3 would tend to reduce conflicts by changing the conditions for motorized access on all of the area available for motorized access for dispersed camping.

Motorized mixed use would be prohibited on less than 1% of the existing designated road system. This would, when compared with Alternative 1, potentially slightly reduce conflicts for people that prefer driving for pleasure or utilitarian purposes in highway-legal vehicles on National Forest System roads and reduce opportunities for people who prefer driving non-highway-legal on NFS roads for pleasure or utilitarian purposes and as connections

between roads or to dispersed campsites. Alternatives 2 and 3 would reduce the amount of motorized access off designated routes within the Wildland-Urban Interface and reduce motorized access for dispersed camping. This would reduce opportunities for people who value unregulated motorized access from their homes or property to public lands and also reduce potential disturbance and conflicts adjacent landowners believe are from unregulated motorized access

Alternative 3 would change approximately 21% of the Deschutes and 7% of all open routes with motorized access for dispersed camping from general to special provisions. This would reduce opportunities for motorized access for dispersed camping in previously unused or lightly used areas and would eliminate opportunities for motorized access for dispersed camping in Inventoried Roadless Areas. This would reduce opportunities for people who value discovery and solitude with motorized access for dispersed camping, but would reduce potential for conflicts with those who value peace and quiet away from sights, sounds, and evidence of motorized uses.

Affected Environment

This section will provide a backdrop of the area by describing the people living in and visiting the area, how they are currently using the Deschutes and Ochoco National Forests, especially for recreation, and provide an overview of the economic makeup of the counties and the communities within them that my be potentially affected by the decisions in this EIS.

Overview

The Deschutes and Ochoco National Forest and Crooked River National Grassland cover just over two million acres and include lands within ten Oregon counties. Table 3-87 displays the amount of lands within the two National Forests (including the Grassland).

The primary area affected by the proposed action lies mostly within four counties east of the Cascades in central Oregon. These are Deschutes, Crook, Jefferson, and Klamath counties. Deschutes, Crook, and Jefferson counties are generally understood to comprise Central Oregon and function as an economic region. Although Klamath County is not considered a major part of the Central Oregon economic region, Deschutes National Forest lands and the uses that occur in and around those lands are becoming of increasing social and economic importance to the County. Lake, Grant, Douglas, Lane, Linn and Wheeler Counties are not discussed in detail in this analysis because of the relatively small percentage of the Deschutes and Ochoco National Forest lands that lies within those counties.

Table 3-87 – Deschutes and Ochoco National Forest and County Lands[65]

County	Deschutes and Ochoco National Forest Acres	Total County Acres	% County Lands within Deschutes and Ochoco National Forest	% Deschutes and Ochoco National Forest Lands within County
Deschutes	989,366	1,955,129	51%	42%
Crook	426,216	1,912,040	22%	18%
Jefferson	274,116	1,146,346	24%	12%
Klamath	285,492	3,926,806	7%	12%
Lake	173,936	5,349,147	3%	7%
Wheeler	129,816	1,097,712	12%	6%
Grant	57,841	2,898,559	2%	2%
Lane	1,986	2,955,251	0%	1%
Douglas	214	3,244,790	0%	0%
Linn	879	1,478,459	0%	0%

[65] From Deschutes and Ochoco National Forest geospatial data base queriies

Three of the four primary counties – Crook, Jefferson, and Klamath - are primarily rural. The economies of all of these counties are based primarily on ranching and agriculture, although recreation and tourism is become a growing sector in all of these economies. The economy of Deschutes County is relatively dominant over the other three counties, largely due to the growth and demographics of the population of the Bend-Redmond area. All of the counties are distinguished by a vibrant metropolitan area that focuses population growth, and all have seen or are undergoing major shifts in their economies from ranching, agricultural and forest land use to resort and residential uses in the past ten years. Below is a brief description of each of the counties in the study area taken from the Oregon Blue Book website.[66]

Deschutes County

Deschutes County encompasses 3,055 square miles and is located in the central portion of the state. It is bounded by Jefferson County to the north, Crook County to the east, Klamath and Lake Counties to the south, and Lane and Linn counties to the west. The county seat is located in the city of Bend. Geographically, the county includes portions of the Cascade Mountains and the central high desert plateau. The Bend-Redmond urban block is in the center of the county and the central Cascade Mountains dominate the western portion of the county. The edge of the high desert Columbia Plateau and the Great Basin and Range border the county to the east. Principal industries in the county are tourism, timber, and agriculture, chiefly cattle and potatoes. Destination resorts have also become an economic factor in the region. The Mount Bachelor ski area and High Desert Museum add to the tourism-based economy in the county as well. The first county census taken in 1920 enumerated a population of 9,622 inhabitants. Deschutes County has experienced the most rapid growth of any county of the state in recent years. The 2000 population of 115,367 was a 53.91% increase over 1990. The 2006 population of 152,615 represented an increase of 32.3% over 2000.

Crook County

Crook County is situated in the geographic center of Oregon. It has been reduced from its original size of 8,600 square miles to 2,991 square miles by the creation of Jefferson County in 1914 and Deschutes County in 1916. The current boundaries were established in 1927. Crook County is bounded by Jefferson and Wheeler Counties to the north, Grant and Harney Counties to the east, and Deschutes County to the south and west

The first census in 1890 showed a population of 3,244 excluding the Indians. The last several censuses have shown an increase in inhabitants with the 2006 population of 24,525 representing a 27.9% increase from 2000. The fast pace of growth in the nearby Bend-Redmond area has played a role in the rising population of Crook County.

The economy of the county is based on agriculture and forestry. Agriculture is supported by the development of irrigation districts, which permits the raising of hay, grain, mint, potatoes, and seed. Range and forest lands allow grazing for a sizable livestock industry. The Ochoco National Forest's stand of ponderosa pine is the main source of lumber. As the lumber industry suffers with restricted log cutting, tourism and recreation are helping to strengthen the economy.

Jefferson County

Jefferson County is bounded on the north by Wasco County, on the east by Wheeler and Crook Counties, on the south by Deschutes County, and on the west by Linn and Marion Counties. The county encompasses 1791 square

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[66] **http://arcweb.sos.state.or.us/county/cpmultnomahhome.html).**

miles. The county's population at its first federal census in 1920 was 3,211. The 2000 population of 19,009 represented a 39% increase from 1990.

Principle industries are agriculture, forest products, and recreation. The fertile North Unit Irrigation District in the central part of the county produces seed, potatoes, hay, and mint. The eastern part of the county has dry wheat farming and grazing land for cattle, and the western part is timber country. Warm Springs Forest Product Industries and Kah-Nee Ta Vacation Resort, owned by the Confederated Tribes of the Warm Springs Reservation, provide many jobs in the area. The reservation is located on portions of land in four counties including 236,082 acres in the northwestern corner of Jefferson County.

Klamath County

Klamath County was established on October 17, 1882. It was created from the western part of Lake County and named after a tribe of Indians which white travelers called the Klamath, also spelled Clammite. Klamath County is situated in south central Oregon. The county is bounded on the south by California, on the east by Lake County, on the north by Deschutes County, and on the west by Jackson and Douglas Counties. The county, Oregon's fourth largest, has 6,135 square miles. Klamath Falls is the county seat.

The 1890 census cited a population of 2,444. Since then the county has experienced steady growth. The 2000 population of 63,775 represented a 10.52% increase from 1990.

Historically, Klamath County's economy has been based on timber and agriculture. Three-fourths of the county is forested; however, over half of it is publicly owned. The large stands of timber have resulted in the development of wood products industries in the county. In spite of the altitude, short growing season, low rainfall, and cold winters, agricultural plays an important role in the local economy. Excellent soil, adequate water for irrigation, extensive sunshine, and the introduction of cash crops such as potatoes and feed barley contribute to the agricultural industry. There is the potential to develop geothermal energy through the exploitation of the geothermal water found in many parts of the county. The many lakes and mountains, including Crater Lake National Park, attract tourists and recreational visitors to the county.

The Klamath Indian Tribe and Reservation add to the county's history. The Klamath Reservation was established in 1864 by treaty and covered about fifty square miles of land east and northeast of Klamath Falls. The federal government's policy of termination and assimilation resulted in the tribe being abolished in 1961. However, in 1975 a fully functioning tribal government was reestablished, and the Klamath Tribe was recognized by the federal government in 1986. The 2000 census showed the tribe to consist of 2,632 members

Population Characteristics

Population characteristics, in particular population structure, including size, composition, density, and population dynamics showing how the structure of the population changes over time is information that is useful in identifying the potential effects and consequences of proposed activities on the social environment. Important population characteristics include age, gender, race, and ethnicity.

Increases in population can increase user demands on existing travel routes, access and recreation opportunities (Cordell and Overdevest 2001). When the increase is primarily through migration into an area, it can also increase demand for different combination uses and level of those uses. For example, more users can result in conflicts among people with similar values due to crowding. Population changes and changes in community values may lead to conflicts over national forest uses, motorized access, recreation activities, and other values associated with resource management activities. People with different values often have different attitudes, beliefs, or behaviors that clash and lead to conflict.

Population Trends and Projections[67]

From 1970 to 2006 population within the four county area grew by 157,812 people, a 158% increase in population. At an annual rate, this represents an increase of 2.7%. (See Figure 3-17). This population growth is not generally impacted by national recessions. Over the last 36 years population growth in the four county area has outpaced Oregon and the nation. (See Figure 3-18)

Figure 3-17 – Population Trends

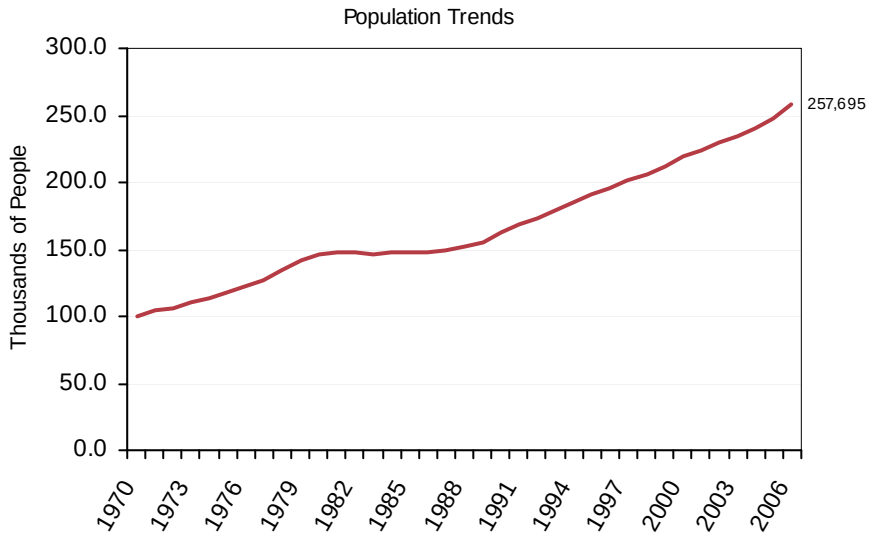
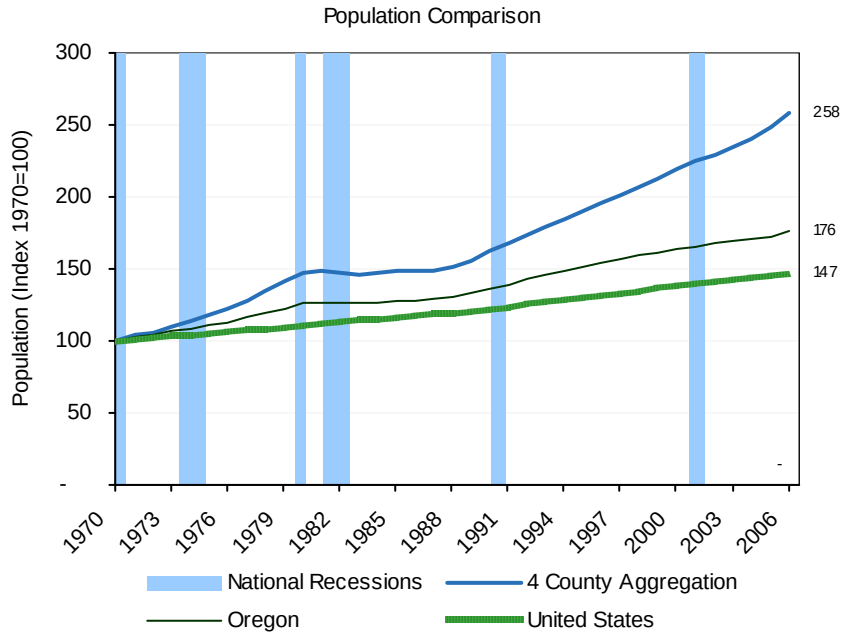


Figure 3-18 – Population Comparison



[67] Population trends described below have been aggregated for the four county area by Headwaters Economics. A full copy of the aggregated report is available upon request.

Table 3-88a and 3-88b are from the Economic Development for Central Oregon website,[68] and reflect the actual population of the Counties and Cities in just the Tri- County area (Crook, Jefferson & Deschutes Counties, not including Klamath County) between 1990 – 2005 and the projected Tri-County and Oregon State Growth Rates between 2000 – 2008. Although this data is not directly comparable to those data gathered for the U.S. Census, it provides another piece of information related to the robust growth in the core tri-county area of central Oregon. This data indicates the population growth rate in the 13-year period from 1990-2007 was approximately 33%. The growth rate during the period from 2000 – 2007 was 35.9%. The percent change from 2007 – 2008 was down by about 3.6% to just over 32%.

Overall, when combining the data on population growth from across the four county area, this reflects a robust, even at times explosive, population growth has changed the character of the area and the attitudes, beliefs, and values that many of the residents take toward recreation and public land uses.

Table 3-88a – Actual Population of Counties and Cities in Tri- County Area 1990 - 2005

	Actual							
Counties & Cities	**2005**	**2004**	**2003**	**2002**	**2001**	**2000***	**1995**	**1990***
Crook County	**21,150**	**20,650**	**20,300**	**20,200**	**19,850**	**19,182**	**15,700**	**14,111**
Prineville	9,082	8,640	8,500	8,150	7,750	7,356	8,205	5,355
Unincorporated	12,068	12,010	11,800	12,050	12,100	11,826	9,947	8,756
Deschutes County	**143,481**	**135,450**	**130,500**	**126,500**	**122,050**	**115,367**	**89,500**	**74,958**
Bend	70,328	65,210	62,900	57,750	55,080	52,029	29,425	20,469
Redmond	21,110	18,100	17,450	16,110	14,960	13,481	9,650	7,163
Sisters	1,706	1,490	1,430	1,080	960	959	765	679
Unincorporated	50,337	50,650	48,720	51,560	51,050	48,898	49,660	46,647
Jefferson County	**20,600**	**20,250**	**19,900**	**19,850**	**19,400**	**19,009**	**15,400**	**13,676**
Culver	1,019	850	840	840	800	802	600	570
Madras	5,592	5,430	5,370	5,290	5,200	5,078	4,290	3,443
Metolius	804	790	780	770	660	635	540	450
Warm Springs	NA	NA	NA	NA	NA	5,727	NA	NA
Unincorporated	13,185	13,180	12,910	12,950	12,740	6,767	9,905	9,213
Total Area Population	**185,231**	**176,350**	**170,700**	**166,550**	**161,300**	**153,558**	**120,600**	**102,745**

[68] **HTTP://WWW.EDCOINFO.COM**

Table 3-88b – Tri County and State Growth Rates 2000 – 2008

County	2000	2005	2007	2008	2000-07 % Growth	2007-08 Change (% Growth)
Tri County Area	153,558	185,240	208,725	216,310	35.9%	7,585 (3.6%)
Oregon	3,436,750	3,631,440	3,745,455	3,791,075	9.0%	45,620 (1.2%)
U.S.	282,194,308	295,895,897	301,621,157	303,824,640	6.9%	220,349 (0.7%)

Sources: Portland State University Center for Population Research; U.S. Census Bureau; estimates are for July of each year.

Age, Gender, and Racial Composition and Poverty Levels

Components of population structure such as gender, age, race, and ethnicity are often predictors of attitudes, beliefs, and values about travel management, forest management, and forest use. For example, people in different age categories often belong to different generations. They often have different values that influence their attitudes and beliefs. People's cultural and ethic backgrounds may also affect how they perceive, react, or be affected by motorized access on public lands. Understanding the racial composition and poverty characteristics of the area also helps to identify whether there are environmental justice concerns. Environmental Justice is defined at the end of Chapter 3 of this EIS. The data to support the summary conclusions in that section is presented here.

Age and Gender

There is significant discussion in the literature about the aging population in the United States and the potential impacts that this change may have on patterns of forest use as well as attitudes, beliefs, and values toward forest use. Research indicates that popular retirement communities include natural amenities, such as scenic beauty and recreational opportunities, and are often in proximity to National Forests and National Parks (Cordell and Overdevest 2001). The impact of retirement aged people on their community is often complex; it includes bringing in other sources of income and the desire for different types of recreation and modes of access. An aging population also brings with it a change in the type of recreation activities, degree of mobility, and amount and timing of leisure time spent in recreational or other pursuits involving motorized access within on the National Forests and Grassland.

The population in the four-county area has, on average, gotten older since 1990. The median age in 2000 for the four-county area is 38.0 years, up from 35.2 years in 1990. This is slightly higher than the either the state or national median age, and reflects the influx of retirement aged people into the central Oregon Area. In the four-county region, Crook County has a higher median age than the average, while Jefferson County has a lower median age that is closer to that of 1990. Both Deschutes and Klamath Counties reflect the median age of 38 years.[69]

[69] From EPS Report on Central Oregon "A Profile of Environmental Justice" (August 14, 2009)

Total Population in 2000 was 217,333 people, up 35% from 160,447 in 1990. In this geographic region, the population growth has not generally been impacted by national recessions during that time period. The age group that has grown the fastest, as a share of total, is 50 to 54 years, up 7,895 people. Their share of total rose by 2.4%. The largest age category is 45 to 49 years old (17,274 people or 7.9% of the total).

Overall, the population is fairly evenly split between males and females, with slightly more males than females under 20. That trend changes beginning with the Baby Boomers, and for those age 65 and over, females are in a distinct majority. (See Table 3-89)

Table 3-89– Population by Age and Gender within the Four County Area

Population by Age and Gender									
	Total	Under 20 years		40 - 54 (Baby Boom in 2000)		65 years and over		Median Age	Density (Pop. per sq. mi.)
	Number	Number	Share	Number	Share	Number	Share		
Total Population									
2000	217,333	61,222	28%	49,989	23%	29,790	14%	38.0	15.8
1990	160,447	46,966	29%	29,577	18%	22,576	14%	35.2	11.7
10 Yr. Change	56,886	14,256	-1%	20,412	5%	7,214	0%	2.8	4.1
10 Yr. % Change	35%	30%		69%		32%		8%	35%
2000 Sex Breakout									
Male	108,380	31,514	29%	24,714	23%	13,744	13%	37.1	
Female	108,953	29,708	27%	25,275	23%	16,046	15%	38.8	
Male/Female Split	50% / 50%	51% / 49%		49% / 51%		46% / 54%			

Racial and Ethnic Composition

Census data shows that, overall, the four-county area has 90% of its population classified as white. This is about 3% higher than the state-wide percentage, and 15% higher than the national percentage. The second largest racial group is American Indians; although the combined total of people who classified themselves as either two or more undefined races or some other race not listed in the options provided in the census report had a greater combined percentage than did American Indians. (See Table 3-90). Jefferson County has the highest percentage of people that classified themselves as something other than white alone, and the highest percentage of American Indians.

Table 3-90. Population by Race in the Region

	Deschutes OR	Crook OR	Jefferson OR	Klamath OR	Region	Oregon	United States
White alone	109,423	17,830	13,113	55,695	196,061	2,961,623	211,460,626
Black or African American alone	222	8	50	404	684	55,662	34,658,190
American Indian alone	956	250	2,981	2,672	6,859	45,211	2,475,956
Asian alone	849	82	57	512	1,500	101,350	10,242,998
Native Hawaiian & Oth.Pacific Is. alone	85	6	42	79	212	7,976	398,835
Some other race	1,574	731	2,152	2,200	6,657	144,832	15,359,073
Two or more races	2,258	275	614	2,213	5,360	104,745	6,826,228
All Races	115,367	19,182	19,009	63,775	217,333	3,421,399	281,421,906
	Percent of Total						
White alone	95%	93%	69%	87%	90%	87%	75%
Black or African American alone	0%	0%	0%	1%	0%	2%	12%
American Indian alone	1%	1%	16%	4%	3%	1%	1%
Asian alone	1%	0%	0%	1%	1%	3%	4%
Native Hawaiian & Oth.Pacific Is. alone	0%	0%	0%	0%	0%	0%	0%
Some other race	1%	4%	11%	3%	3%	4%	5%
Two or more races	2%	1%	3%	3%	2%	3%	2%

Hispanics as an ethnic group, (which could be included in any of the race classifications) represent about 6% of the total population across the four-county central Oregon region. In the state of Oregon, 8% of the population is Hispanic or Latino. (See Table 3-91) This percentage is notably different by county, with Jefferson County showing an Hispanic population of more than 17%, while Deschutes County shows an Hispanic population of around 4%. Overall, Jefferson County has the most diverse racial and ethnic population mix in the region, and also higher than the state and country. Klamath County is fairly reflective of the state-wide percentages for racial and ethnic diversity, while Deschutes and Crook both rank lower than either state or national percentages.

Table 3-91. Hispanic Population Composition

Geography	Hispanic Pop.	% of Total Pop.
Deschutes OR	4,304	4%
Crook OR	1,082	6%
Jefferson OR	3,372	18%
Klamath OR	4,961	8%
Region	13,719	6%
Oregon	275,314	8%
United States	35,305,818	13%

Poverty Levels

Poverty levels for the four-county area based on 2007 projections from the U.S. Census , show Jefferson and Klamath counties with the highest poverty rates. (See Table 3-92). These rates are higher than the state average of 13%. Crook County is slightly below the state-wide average, while Deschutes County is significantly lower than the state-wide average and the other counties in the area.

Table 3-92: Poverty by County[70]

County	% of Population at or below Poverty Level
Deschutes	8.9%
Jefferson	18.8%
Crook	12.8%
Klamath	15.7%

People with Disabilities

In the 2000 Census survey, people were defined as having a disability if one or more of the following conditions were true:

• They were aged 5 or older and responded "yes" to a sensory, physical, mental, or self-care disability.

• They were aged 16 years or older and responded "yes" to a disability affecting going outside the home.

• They were between the ages of 16 and 64 and responded "yes" to an employment disability.

Except for Deschutes County, all of the counties within which the two Forests and Grassland lie have slightly higher than the statewide average (31%) and substantially higher than the national average (19%) percent of total population that are classified as people with disabilities. Statewide, in Oregon, Curry County ranks the highest percentage of population at 49%, with Benton County the lowest percentage of population at 22 %. Of the four primary counties evaluated, Klamath and Crook Counties have the highest percentage of populations of people with disabilities, although Deschutes County has the highest total population of people with disabilities. These numbers may be attributed, in part, to the increase in older populations in the four-county area since 1990, represented by an increase in the number of retirees who have moved to the Bend area.

Table 3-93 – People with Disabilities – Percent of Population

	Total disabilities *	Total population : Total	% with disability
Deschutes	**31,862**	115,367	**28**
Crook	**7,172**	19,182	**37**
Jefferson	**5,901**	19,009	**31**
Klamath	**24,337**	63,775	**38**
State Total	**1,069,450**	3,421,399	**31**

[70] Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, Census of Population and Housing, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits, Consolidated Federal Funds Report
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Population Characteristics of OHV Users

This section briefly describes the population characteristics of OHV users in the Oregon, the Pacific Region (Oregon, Washington, and California), and the local central Oregon area based on a variety of sources.

Population Characteristics of OHV Users in Oregon

The information in the following sections on the age, race, and ethnicity of OHV users in Oregon is drawn from an extensive 2008 report entitled, "Off-Highway Vehicle Recreation in the United States and its Regions and States: An Update National Report" The report comes from the National Survey on Recreation and the Environment (NSRE), Internet Research Information Series (IRIS). The data show that Oregon has a slightly higher percentage of OHV users than the Pacific region as a whole. The 2004 Oregon Statewide Motorized Trail User Survey was conducted over a four-month period from January to April 2004 by the University of Oregon's Survey Research Laboratory. The survey found that seven percent of Oregon households have a person reporting motorized trail use, amounting to 98,000 households in the state. ATV riding is the most popular activity, with 70% of motorized trail users having engaged in that activity during the past year followed by off-road motorcycling (44%). Most motorized respondents were male, and the median age was 40 – 49 years old. More than half had some college (62%), although most were not college graduates (21%). Median income was $40,000 to $69,999.

Population Characteristics of OHV Users in the Pacific Region

In the Pacific Region (Washington, Oregon, and California), the rate of OHV participation (18.7%) is nearly the same as the national rate. The 6.9 million OHV users living in the Pacific region are about 16% of the national total. Similar to other regions, participation declines with age. People under age 30 are about three times more likely to participate as those over 50. Males are also significantly more likely to be OHV users than females. American Indians have the highest participation rate (31%) among racial and ethnic groups, just as they do in every other region. Though the Hispanic rate (14%) is next to the lowest, the number of Pacific Hispanic OHV users (about 1.3 million) is second only to Whites. This is due to the large Hispanic population, especially in California.

People with family incomes over $50,000 all participated at similar rates (23 to 27 percent). Only 12% of the lowest income class participated. Similar to every other region, the highest educated strata participated at the lowest rates. Just 13% of people with post-graduate degrees were OHV users compared with 21% of high school graduates and those attending some college or technical school. Also similar to every other region, the participation rate for non-metropolitan residents (32%) was much higher than for metro-area dwellers (18%), however, since the population in the Pacific region is more than 90% metropolitan, this population group dominated the OHV users, accounting for about 89 percent of the 6.9 million participants.

Table 3-94 – Percent of population and number of people age 16 and older participating in off-highway vehicle recreation, by demographic category, 1999-2007, Pacific Region[71]

Demographic	Strata	Population (1000s)	Sample Size	Percent participating	Participants
All Groups	All people age 16+	37,006.1	9,684	18.7	6909.2
Age	Under 30	9,742.9	2267	29.7	2898.1
	30-50	14,736.9	3999	19.0	2805.1
	51 & older	12,525.2	3230	9.7	1206.0

[71] Cordell, Ken et al. p.31

Gender	Male	18,360.0	4461	23.5	4303.7
	Female	18,646.0	5196	13.9	2605.6
Race/Ethnicity	White	19,901.1	6874	23.2	4613.6
	Black	1,925.2	343	16.1	310.3
	American Indian	324.8	187	30.6	99.5
	Asian/Pacific Islander	4,598.0	602	11.2	515.1
	Hispanic	9517.7	1334	13.9	1323.8
Annual Income	$25,000 or less	5,607.3	1132	12.0	673.5
	$25,000 to $49,999	7,498.1	1778	19.4	1455.3
	$50,000 to $74,999	5,932.0	1439	23.0	1364.4
	$75,000 to $99,999	3,683.5	813	23.3	859.5
	$100,000 to $149,999	3,232.6	686	24.1	779.3
	$150,000 or more	2,052.0	446	27.2	557.6
Education	Less than high school	7,171.7	938	17.9	1286.6
	High school graduate	7,396.1	1,974	20.9	1,545.7
	Some college/tech school	10,501.4	3,076	21.5	2,259.6
	Bachelor's degree	5,191.5	2,128	15.4	800.1
	Post-graduate degree	2,704.6	1,404	12.5	338.2
Place of residence	Non-metropolitan	2,357.1	1,874	32.0	753.9
	Metropolitan	34,649.0	7,810	17.7	6,155.3

Population Characteristics of OHV Users in Central Oregon

Based on the initial data of the Central Oregon Off-Highway Vehicle Use Study conducted by Virginia State University during 2008, seventy-seven percent of the visitors are returning users to Central Oregon OHV trails. Seventy percent of the visits are overnight use and average a 3 day trip. Thirty percent make day use trips averaging a 6 hour day. In a typical year, 12 days were spent recreating in Central Oregon, 24 days at other OHV areas. The average miles from the primary residence to this area was 129 miles.

The composition of the various groups visiting the area was 42% friends, 30 % family and friends, 24% family, 3% single and 1½% organized club or organization. Forty one percent of the visitors were 31-40 years old.

Social Conditions and Trends

Lifestyles, Attitudes, Beliefs, and Values

People in the central Oregon area are, and always have been, extremely outdoor-oriented in work and play. Although historically agriculture, ranching, and forestry were dominant cultural forces in the area in the past, this

trend has seen a dramatic change - particularly in Deschutes County - with a steady transition to the services sector which includes tourism and recreation support services. Rural residential and resort development of former industrial timberlands and large ranches throughout the area is an important indicator of the change to these traditional lifestyles. These developments, when adjacent to or nestled within the two National Forests, are especially desirable to various communities for recreational access.

The term value has different meanings in different contexts. In general, value refers to the equivalence or worth of a thing in terms of money or goods. One definition of value is an enduring belief that a specific mode of conduct is socially preferable to an opposite mode of conduct. A value system is also defined as an enduring organization of beliefs concerning preferable modes of conduct or end states of existence along a continuum of relative importance. A third way of describing a value is a belief about what ought to be, what ought not to be, what is right, what is wrong. Values are relatively enduring traits that influence our thoughts (Packiananthan Chelladurai, p.84). Values are relatively difficult to express in words, but understanding people's values is important because it is frequently these values that influence long-term goals and decisions.

Attitude is a term that is often used in conjunction with values. An attitude refers to an organization of several beliefs around a specific object or situation. A value on the other hand, refers to a single belief of a very specific kind. A value concerns a desirable mode of behavior or end-state that has transcendental quality to it, guiding actions, attitudes, judgments, and comparisons across specific objects and situations and beyond immediate goals to more ultimate goals.

There is also an important distinction between values and norms. A value refers to both end states and the means to them. A norm refers only to the means, which is the mode of behavior. A value is not limited to a specific situation, but a norm specifies a certain code of conduct in a specific situation. Moreover, a value is something personal and internal to the individual. A norm is a code of conduct reflecting a common understanding by the people involved in the situation (Packiananthan Chelladurai, p. 84)

A study completed by the Forest Service in 2002 surveyed the American public regarding their values with respect to public lands, objectives for management of public lands (including recreation management) and beliefs about the role the Forest Service should play in fulfilling those objectives. The study concludes that the public sees the promotion of ecosystem health and the protection of watersheds as important objectives. When queried specifically about recreation opportunities, the public supports multiple uses, but not all uses to the same degree. The study found that providing access to additional motorized recreation opportunities was not a high priority objective, while preserving the opportunity to have a "Wilderness experience" was important. Providing opportunities and facilities for non-motorized recreation was seen as a somewhat important objective and role for the agency. Separating these often conflicting types of pursuits (motorized and non-motorized uses) by designating trails for specific uses was seen as a somewhat important objective (Shields et al. 2002).

Values for lands and natural resources take many forms, such as commodity, amenity, environmental quality, ecological, public use, spiritual, health, and security (Stankey and Clark 1991). In the past, natural resource management tended to emphasize commodity values. The emerging emphasis on other values has forced a reevaluation of the commodity emphasis. Stankey and Clark (1991) state, "A new focus on the part of the public involves a shift from commodities and services to environments and habitats. The public is much more concerned about forest ecosystems than they have been previously and is more concerned with having access to decisions about them."

The Deschutes and Ochoco National Forests held public workshops in Prineville, LaPine, Sisters, Madras, and Bend in 2006-2007, and chartered a federal advisory Travel Management Subcommittee and Working Group to help identify the most important values on the Forests related to motorized access.

Given an open opportunity to identify values they associated with the planning area at the public workshops, people most often identified activities that they valued doing in an area. Comments from over 200 people were

generated from these meetings, and included a wide variety of sentiments concerning people's attitudes, beliefs, and values concerning motorized access, that were displayed in Figure 3-18. The following comments were part of the comments compiled during the workshops.

"Recreational outings/drives with elderly family members, exploring new areas by motor vehicle are what I value."

"The scenery and beauty of Central Oregon affords a unique place to wander through a vast natural setting on public lands. I enjoy the sense of endless exploration potential the areas offer, and a unique place to wander through a vast natural setting. I also enjoy taking friends and family out on ATVs to enjoy the landscape. Roads that go nowhere with somewhere to let the dog off the leash are important to me. Access to rock collecting, cycling (moto & mtn. bike), hiking, fishing and general full use of the forest are also valued activities."

"Central Oregon provides a wide array of travel and viewing experiences – high mountains, clean streams, deep lakes, steep ravines, and open desert. One can still pretend to be an explorer and enjoy the discovery! Outside existing wilderness, one can currently drive a vehicle to nearly any of these areas; for exploring, camping, fishing, hunting, teaching children about their heritage and connection to the land. Please keep it that way."

"I value a place to ride my horse without fearing for my life due to 4-wheelers. The forest should provide places to view birds, wildlife, and native vegetation, minimal people, non-hunting areas, areas for photography, and stands of trees greater than 16" dbh, no clear cuts, and good Goshawk habitat areas. We want sounds of nature, animals, streams, birds, etc. and not motorized vehicles or the speedboat sounds of snowmobiles."

"I value riding OHV on existing legal roads/trails as family recreation, with respect to other users. It's a place my teenage sons still love to go with their parents to ride OHVs. The beauty, the quiet, and the access to places we would never otherwise get to on foot. I want the ability to access scenic areas with my class II vehicle (routes that are both scenic and challenging)."

"I value viewing & experiencing multiple diverse areas that I am no longer able to walk into. Have enjoyed them during my life and now need motorized assistance to reach. OHVers also enjoy these things (wildlife/solitude) – that's why we ride. We also hike, kayak, etc. and are responsible and respectful. We don't need more restriction, but simply education and enforcement of existing rules – not more closures. So what's wrong with using all the wilderness areas?"
"I want to be able to stay close to home and enjoy the forest on class I, II, and III in the winter. We enjoy wildlife from trails. I think they like us also as they watch us too. I think opportunities for multiple use but not always mixed use would be best. Please expand OHV trails…particularly Class II, and open up some areas for hill climbs. I prefer to have lots of options without having to ride on a designated dusty trail with hundreds of other folks just to access scenic and photo opportunities, family/group camping, and riding in dispersed areas."

"I value freedom, solitude, and snow. I feel that trails should provide hunting opportunities and back country access for hiking, etc."

"It is important to educate and demonstrate to family and friends the wonders and beauty of the forest we need to cherish. The forest should be a place to take our family for OHV use, animal watching, hunting, and getting out deeper into the woods than one could walk from trailheads."

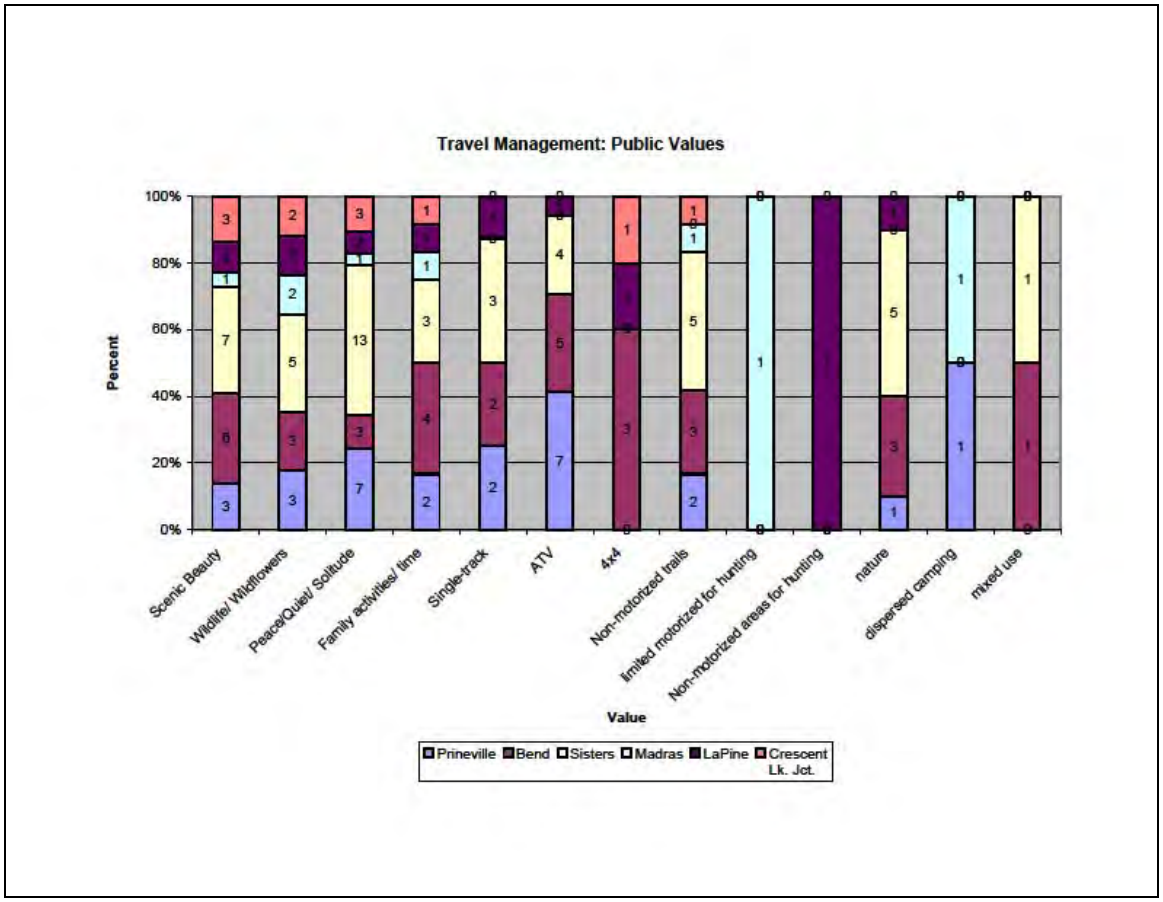
"Wildflowers, wildlife, wetlands, and hydrology protection should be of the utmost importance."

"I enjoy being able to get off main roads and travel on less traveled, more primitive roads. I also like to get to dispersed camping areas, as well as developed camping, fishing, trailheads, etc., and being able to get to non-motorized areas. I value the opportunities to see and hear wildlife, observe plant life, enjoy beautiful scenery and

unspoiled landscapes, and breathe unpolluted air. I value solitude along with the lack of noise, traffic, and people."

"I feel the forest should be a place to take family for OHV activities. I enjoy the ability to get to many places in the forest by OHV, and to camp within 150 feet of a designated road. I like to travel where I wish, stop and shoot, ride ATVs, 4-wheel on public lands, as deserved as an American. The forest should not be restricted to only groups choosing to walk or mountain bike. Everyone does not have the time or sometimes good health to saunter about."

Figure 3-18 – Activities and Values – 2006 Public Workshops.



In 2006, the Deschutes Provincial Advisory Committee chartered a Travel Management Subcommittee and Working Group with representation from a wide variety of interests. The group met for over 1000 person-hours during 2006-2008 and identified many shared values including:

- Wildlife and natural resources
- Solitude and scenery
- Ruggedness and the beauty of the natural setting offered in the Forests & Grassland
- Minimum of regulation and encroachment by other users
- Unique privilege of recreating and using the National Forests & Grassland
- Responsible use

A demonstration test of an internet map-based social values study was conducted by the Green Mountain College for the Deschutes and Ochoco National Forests during the same period. The study offered a sample of people from locales that had visited the forest and people who had specifically identified themselves as interested in

forest or travel management issue an opportunity to select from a prescribed list social values those values they thought applied to certain places. Several people contacted the Forest strongly concerned with study bias. These people expressed the belief that the limited list of values did not reflect *their* values because it was not tied to their activities, and that the list was too "ecologically" and not enough "human" focused. Most of the people that raised this concern were people that made their living working in the woods, such as timber industry representatives, or were motorized recreationists or users.

All this information supports the close relationship of values and to activities and lifestyle. As represented by the comments cited above, these elements can be so closely linked that some people strongly believe that one cannot be fully represented without the other. Also, as noted in the national survey, and as supported by the response of the Travel Management Working Group, people often share a particular value – such as solitude or scenery, but may find they pursue very different, and sometimes incompatible activities to achieve those values on National Forest lands.

In Montana, a statewide OHV study (Institute for Tourism and Recreation Research 1994) asked both motorized vehicle and non-motorized respondents about their motivations for taking a trail trip. The most important motivations were nature (be in a natural setting, understand the natural world better), physical fitness (improve my physical health, help keep me in shape), stress release (get away from my everyday responsibilities, help reduce or release some built-up tensions), and affiliation (so I could do things with my companions, be with others who enjoy the same things I do).

Changing Attitudes and Increasing Conflict

Recreation researchers often define the verb "conflict" alongside its opposite, the verb "to share." The verb "share" is generally defined as "to distribute parts of something among others, to retain part of something and give the rest or part of the rest to another or other; to take or to use a part of something with someone or something; to do or to experience something with others; to join with others; to join with others in doing or experiencing something." On the other hand, the verb "conflict" is defined by the New Webster's Dictionary as "to be at variance, clash, to struggle, or contend." Conflict can cause serious impacts to recreational experiences, to the point of causing some users to end their use and be displaced by other preemptive users. For example, when trail users fail to achieve the experiences desired from the trip and determines that it is due to someone else's behavior, conflict results, satisfaction suffers, and use patterns may change (Moore, R.L.).

According to recreation researchers, recreation-related conflict is asymmetrical. Many times feelings of conflict are one-way. For example, cross-country skiers dislike encountering snowmobiles, but snowmobiles are not as unhappy about encountering cross-country skiers. Likewise, hikers generally dislike encountering OHV users, but OHV users are not as unhappy about encountering hikers. (Moore, R.L.) Another major source of conflict is the difference in attitudes toward and perceptions of the environment. Some examples of how people commented on the proposed action during the scoping process demonstrate some of these attitudes and perceptions:

"Motorized vehicle roads and trails are not essential for a pleasing recreation experience; in fact, quiet use on non-motorized trails arguably makes for a better experience with more wildlife viewing opportunities and less Intrusive disrupting noise."

"OHV recreation can be managed and sustainable, while also providing a valuable recreational experience for OHV enthusiasts. Motorized recreation is a family activity that offers an opportunity for parents and children to experience all that our public lands have to offer in a unique manner."

Recreation users in conflict have been found to have different attitudes toward the environment (Moore, R.L.) and may perceive the environment differently. Some view the natural environment as an integral part of their experience. Others view the natural environment more as a setting for their activity. This conflict may also occur between people who view the national forests as an essential setting for their lifestyle, such as ranchers and residents adjacent to National Forest or other public lands. The following comment from the scoping letters reflects sentiments often heard from ranchers in the central Oregon area.

"As a rancher who has lands adjoining the national (sic) forest in Crook County, I am appalled at the damage done to our fragile land by these vehicles. In addition, I am constantly fixing fence that has been cut by horn hunters using these vehicles, which leave forest service land and cross my property. ALL OFF-ROAD VEHICLES SHOULD BE BANNED; period. They may be recreation to some people, but they are spoilers of our environment to the rest of us."

Research (Williams 1993a) shows that factors that influence the likelihood of conflict include activity style, resource specificity, mode of experience, and tolerance for lifestyle diversity. Conflict is much more likely to occur it the activity is an integral part of the person's lifestyle rather than an occasional activity. Resource specificity refers to the significance a person attaches to using a specific resource. Conflict is more likely to occur when the person has a special relationship with a place and perceives others are disrupting the traditional uses of the place or devaluing its meaning. Mode of experience refers to the way in which the environment is perceived. Conflict is most likely to occur when the person perceives the environment as part of the experience rather than as a backdrop for the experience. The last factor is tolerance for lifestyle. Conflict is more likely to occur when the user has a higher tendency to reject lifestyles that are different than his or her own. Examples include a preference for motor vehicle uses versus non-motorized uses, or consumptive versus non-consumptive activities.

People who view the environment as an integral part of their recreation experience are more susceptible to conflict than those who see the environment as primarily a setting for their activity. In applying this concept, there are recreationists who participate in an activity – either motorized or non-motorized - to enjoy the environment and there are others for whom the environment provides a setting to enjoy their motorized or non-motorized activity. So, for instance, a marathon runner, or a person on a mountain bike, or an OHV may be less susceptible to conflict with other users if the setting is less important to the activity than the activity itself, whereas people for whom the setting or environment is the most important component of the activity are more likely to be susceptible to conflict with other users within that setting.

Noise, dust, and smells associated with activities are also harbingers and indicators of potential conflict. Generally speaking, the louder, dustier, and more odor generated by an activity – in other words, the more one user feels that their recreation setting has been infringed upon by another user - the more likely that activity will be to generate a high level of conflict between different users. These factors become primary players in determining the degree to which conflict may exist.

The residual effects of activities also contribute to the degree to which people experience evidence of conflicting values, attitudes and beliefs. For instance, National Forest and Grasslands within ¼ mile of a population center or residential area will tend to have a large percentage of illegal dumps of garbage, construction, or landscape debris when compared to more isolated areas. These areas – such as the Horse Butte area south of Bend, or the McKay Creek area northeast of Prineville - also tend to attract concentrated uses from the nearby residents and urban areas such as walking dogs, running, bicycle riding, and shooting and hill climbs for OHVs because of the cinder buttes and mineral material sources (cinder or rock pits) in the area. These areas are also often "party areas" that have associated residual garbage, and debris. Depending upon wind direction, the shooting and OHV activities contribute a constant level of noise to nearby residents and to non-motorized users of the area. Areas such as these, in close proximity to residences and urban growth boundaries, with lots of different uses "close in" to people's homes or urban areas, tend to create higher potential for conflict between users. These "Wildland Urban Interface" areas are also coincident with areas of focused concern and management for hazardous fuels reduction activities on the Forests.

The conflict between motorized users and non-motorized users also relates to norms. Individuals and groups with different standards of behavior, social and individual norms that define what behavior is appropriate often conflict with one another. Norms appear to be more useful than goals or values for predicting conflict. For example, a hiker and an OHV user may express the same goal of wanting to experience nature and escaping from the city but may cause conflict for one another due to different modes of acceptable behavior (Moore, R.L.). This concept was clearly illustrated during the Travel Management Subcommittee and Working Group's discussions about shared values.

In the West in places where land use has been relatively unrestricted, there is increasing conflict over the control and management of public lands. Some residents feel that change in public land management is being driven by non-local government officials and environmental advocacy groups who may not have a true understanding of the lands or the people living nearby who depend upon these lands for their livelihood and recreation. There is particular concern about the loss of traditional uses of the land. People with these concerns see a balance to what they consider to be environmental extremism with economic and human concerns. In central Oregon, where public lands have generally been perceived to be open to motorized access unless posted closed, the philosophical change of the proposed actions to essentially close lands to motorized access unless designated open, is a struggle. Some people have expressed that this is more of the government taking away their rights, or punishing the many for the damage caused by a few, while others expressed that this is the government finally stepping up and protecting the natural resources they are responsible for managing for future generations. This dichotomy was illustrated by comments received during the scoping process such as the following:

"First, let me say I am 68 years old, have always been a tax paying citizen since age 16, two of my ancestors fought for America in the Revolutionary War. I have a weak heart after surgery and a defibrillator implanted in my chest. At one time I could hike and climb mountains with the best of them. But now, to get out and enjoy the great outdoors, I ride an ATV. And, as more public lands are closed to ATV riders, I feel as though I am being discriminated against because of my failing health."

"ATV riding is wholesome family recreation that should be a priority when looking at land use. Public lands belong to the public and must remain open for public use."

"Instead of dealing directly and harshly with people who use vehicles to destroy public lands, you are closing the land to all but the young and healthy. … We have camped and hunted the same areas for four generations – 54 years. Where we hunt is two miles from any road. To continue to enjoy this experience we need access. To pack out a deer or elk for two miles of rocky ground is most difficult."

"Over 9,000 mile of designated routes and several designated areas open to off road vehicles is excessive as motorized vehicle use is exclusive to other uses (eg: quiet, nonmotorized recreation) and can disturb wildlife (also with fragmentation of habitat by roads) to the point that rarer and federally listed species and others will no longer use the area…."

Survey respondents in the Montana survey (1994) were also asked what other activities were compatible with the activity they participated in. Not surprisingly, backpacker and day hikers found other non-motorized activities to be most compatible with their activity. In all cases, motor vehicle users were much more likely to say their activity was compatible with day hiking and backpacking. Forty-five percent of the respondents agreed that conflicts on trails are relatively minor while 15 percent disagreed.

According to Boston et al (1997), "OHV recreation covers a huge range of activity from casual family use to intense competition; from use in the backyard to use on high mountains; wildland trail use to open desert. Enjoyment comes from use where the vehicle itself is the focus of the experience to the use of the vehicle as an enjoyable method of reaching or enjoying remote terrain; from a way to escape societal pressure to a way of sharing experiences with family or friends; from casual to organized activities."

This range of use is reflective of comments received during the planning process for the Travel Management Strategy and by members of the Travel Management Subcommittee and Working Group meetings as well. This range of activity is also shared by non-motorized recreationists that use a non-motorized vehicle for their recreational use such as bicyclists and horseback riders.

This discussion of the conflicting attitudes, beliefs, values and norms related to motorized and non-motorized regulation and recreational use demonstrates the difficulty in neutrally defining and evaluating the conflicts between motorized and non-motorized recreation activities.

Both motorized and non-motorized users have concerns about their potential loss of access and loss of opportunities for desired experiences. Comments such as the following[72] demonstrate this mutual concern:

"In the Ochoco National Forest, I can only assume that in the roughly 250 square miles of 'Seasonally Allowed Off Designated Routes,' there are hundreds of miles of trails that will be closed….. the importance of an OHV trail cannot be gauged by a non-OHV using individual for value."

"Oregon Recreation Coalition urges the agency to analyze and appreciate the high OHV recreation value of special areas such as expert-level single track motorcycle trials or high difficulty 4WD rock crawling opportunities. We urge the Forest Service to propose for mixed use designation a substantive number of level 3-5 roads for OHV use to connect up various trails and staging areas."

"We are also concerned with helping to develop OHV trail systems in the Ochoco National Forest. We have experienced outstanding trail riding in Eastern Oregon, and especially in Utah, and would like to see this kind of opportunity exist in the Ochocos."

"Roads are not trails."

"*Many horse groups and individuals including hikers and Mountain Bike Riders have enjoyed this pristine and scenic trail system (Bandit Springs Endurance Ride)… until these past few years since Motorcycles and ATVs have taken the trails over."*

Motorized users indicated that there were already too many areas that were focused on non-motorized access, while many non-motorized users share the belief with environmental advocates that there are too many open designated roads within the Forests., and the increasing number of OHVs and their increased capacity to go to more places has put natural resources at risk and increased incompatibility between both user groups. All of the members of the Travel Management Subcommittee and Working Group shared the sentiments that all users need to value the unique natural resources offered in central Oregon. Motorized users within the group also expressed the views that more tolerance and willingness to share a limited resource with others was an important value, while at the same time many of the non-motorized users expressed doubt that sharing trails would be compatible with their values.

Recreation Trends and Uses

Recreation trends and motorized and non- motorized uses, are described in detail in the Recreation section of this EIS. However, understanding recreation trends and uses within the planning area is important to making an informed evaluation of the likely social and economic effects of decisions affecting motorized access. The social and economic effects of recreation uses are tied to the amount and type of use. These uses and trends related to motorized and non-motorized recreation and access are summarized in this section and the economic contribution

[72] Excerpted from public comment letters received during the scoping phase of the Travel Management EIS.

of these uses follows. Data was used for these summaries from the National Visitor Use Monitoring (NVUM) and the National Survey on Recreation and the Environment (NSRE).

All Uses

A recent study (Outdoor Industry Foundation, 2006) estimated that 72% of Americans aged 16 and older participated in an outdoor activity in 2005, with hiking, running and bicycling on trails being three of the most frequently reported activities. Non-motorized recreation continues to be one of the most popular categories of recreation throughout the state and within the local region. National Visitor Use Monitoring (NVUM) findings show that most visitors participate in non-motorized activities (English, Kocis and Hales 2003). A description of visitor activities was compiled from the survey. During their visit to the two Forests, the top six recreation activities of visitors to the Deschutes National Forest were hiking/walking, relaxing, viewing wildlife, viewing natural features, fishing, and downhill ski/snowboarding. Visitor's top picks while visiting the Ochoco National Forest were viewing wildlife, natural features and scenery; primitive camping; fishing, hunting, and developed camping.

Each visitor also picked one of these activities as their primary activity for the current recreation visit to the forest. The top primary activities for the Deschutes National Forest were downhill skiing or snowboarding, fishing, hiking/walking, relaxing, and viewing natural features; while for the Ochoco the top primary activities were developed camping, viewing wildlife/nature, hunting, horseback riding, and general relaxing. See Table 3-74 in the Recreation section of this chapter.

Other popular dispersed recreation activities for the Deschutes include camping, fishing, hunting (non-commercial), gathering forest products such as antlers, mushrooms, cones, etc., and driving Forest roads for wildlife viewing, or viewing natural scenery. Dispersed camping and day use picnicking are popular activities on the Deschutes Forest accounting for approximately 14% of overall participation. Even more popular on the Ochoco National Forest, these activities account for about 27% of visitors' primary or secondary activities.

National Visitor Use Monitoring data indicates that big-game hunting is a popular activity across both Forests, but much more so on the Ochoco National Forest than on the Deschutes. The Ochoco National Forest is a regionally and even nationally popular destination for big-game hunting. Approximately 22.6% of visitors identified hunting as either a primary or secondary activity on the Ochoco National Forest compared with only abut 3.34 on the Deschutes. Hunting was also in the top five most popular activities for visitors to the Ochoco.

Although many of these activities are often classified as "non-motorized," the lines between motorized and non-motorized uses begin to blur for many of these activities. For instance, viewing natural features, one of the top activities for both forests can be either a motorized or non-motorized activity. Hunting can also be either or both a motorized and non-motorized experience. Some hunters use motorized vehicles both on and off road to scout for and retrieve game, and some hunters will not. Primitive camping could be considered by some to be any camp outside of developed campgrounds that they may have accessed with motorized vehicles for generations; while other visitors taking the survey might consider primitive camping to be a campsite in a remote Wilderness area only accessible after many hours of hiking. Survey data available does not make any distinction for whether motorized use is associated with these activities, although there is data regarding OHV, or off-highway vehicle use specifically as both a primary and secondary activity.

Off-Highway Vehicle Uses

National Visitor Use Monitoring (NVUM) findings indicate that the two Forests were not a major provider of OHV (Off-Highway Vehicle) recreation in the year surveyed. Nationally, about 2.5% of the 205 million annual recreation visits to National Forests identified OHV use as their primary activity, with a slightly higher percentage

(3.1%) as a secondary activity. The percentage of forest visitors that report OHV use as their primary or secondary activity on the Deschutes National Forest is about equal to the national average (English, Kocis and Hales 2004). Data for the Ochoco National Forest indicate a secondary use of 3.1%, which is slightly higher than the national average.

For the Deschutes National Forest, the survey found that 1.00% of all recreation visits that year were primarily for OHV use. This percentage equates to roughly 31,095 visits during 2001/2002. For the Ochoco National Forest, the survey found that there were no recreation visits that year that were primarily for OHV use. The Deschutes National Forest ranks towards the lower end out of twenty administrative units in the Pacific Northwest Region of the Forest Service (R6) for primary OHV uses, while the Ochoco ranks in the bottom three.

For both Forests a somewhat larger percentage of visitors indicated that they participated in OHV recreation even if it was not their primary reason for visiting the Forest. For the Deschutes National Forest, the total percentage of visitors that reported OHV use as a primary or secondary activity was 2.47% of all visits, or roughly 76,802 visits. On the Ochoco National Forest, that percentage was 3.35% of all the visits, or roughly 19,900 visits. These data are considerably below the average percent participation for Oregon overall (22.2% participation) as reported in the National Survey on Recreation and the Environment (Cordell, Betz, Green and Stephens 2008). Considering both primary and secondary percentages, the Deschutes ranks slightly lower than middle, while the Ochoco ranks near the middle.

This data does not necessarily reflect the apparent local and regional demand for motorized trail systems in the area. Central Oregon is a regional destination for OHV trails, with many hundreds of miles of trails that can be used throughout the year. Based on the initial data of the Central Oregon Off-Highway Vehicle Use Study conducted by Virginia State University during 2008, East Fort Rock is the most used area for OHV recreational purposes, second is Millican Valley.

Table 3-96. Central Oregon Off-Highway Vehicle Use Study Data

Henderson Flat	29.4%
East Fort Rock	63.5%
Millican Valley	44.8%
Edison Butte	8.3%
Oregon Dunes NRA	31.6%
Sand Lake	18.1%

Although the East Ft. Rock OHV trail system is a popular destination for many OHV users, overall use is considerably below the average percent participation for Oregon overall (22.2% participation) as reported in the National Survey on Recreation and the Environment (Cordell, Betz, Green and Stephens 2008). Trail use by motorized recreational vehicles is growing in popularity. All-terrain vehicles (ATVs) entered the recreation and tourism marketplace in the early 1970s and, since then, ridership has grown rapidly. The Specialty Vehicle Institute of America (SVIA) estimates that ATV sales increased over 280% nationwide in the US since 1994 (SVIA, 2006). ATV recreation participation is expected to continue to increase across the US through 2015 (Cordell, Betz, Green, & Owens, 2005).

Table 3-97- Secondary activities reported by primary OHV users in the Pacific Northwest Region of the Forest Service[73].

Activity	% of Primary OHV Users
Developed Camping	49.85

[73] *Data source is the first round of National Visitor Use Monitoring surveys (English, Kocis and Hales 2004).*

Activity	% of Primary OHV Users
Primitive Camping	5.96
Viewing Wildlife	24.42
Viewing Natural Features	46.22
Visiting Historic Sites	0.04
Relaxing	46.46
Fishing	1.99
Hunting	0.03
Driving for Pleasure	16.74
Hiking/Walking	20.40
Gathering Forest Products	9.54

There are over 1,375 miles of road open to all motorized travel, and another 220 miles open to highway licensed vehicles only on the Forest. In addition, there are 26 miles of motorized trail open to ATV's and motorcycles. Such an extensive network of roads provides users with a tremendous variety of options to access and view the Forest. Approximately 82% of the Forest is accessible within ½ mile from a road[74].

Recreation Trends

Primary OHV users also participate in a variety of other recreation activities during their forest visit (English, Kocis and Hales 2004). In the Pacific Northwest Region (Region 6), the most popular secondary activity for primary OHV users is developed camping (Table 3-98). Relaxing and viewing natural features also had high participation rates.

Cordell reports on the remarkable growth of OHV use in the United States. At the time of the first US National Recreation Survey in 1960, OHV recreation was not included as a reportable activity (Cordell 2008). OHV use today, however, is among the fastest growing outdoor activities. Nationally, the number of people (16+ years of age) who report participating in OHV sports is over 44 million (See Table 3-98). Annual OHV sales more than tripled between 1995 and 2003 (sales have leveled off since 2003). Total OHV ownership of newly purchased and previously purchased machines increased 174% between 1993 and 2003, from fewer than three million to more than eight million vehicles. ATV's account for about 70% of all OHVs, not counting full-size, 4-wheel drive vehicles (Cordell 2008).

Based on survey data and sales trends, Cordell projected that there could be as many as 9.8 million ATVs and off-road motorcycles in the US in early 2008 (Cordell 2008).

[74] Based on calculations from the Deschutes and Ochoco National Forest geospatial data base.

National Recreation Trend Projections

Table 3-98 - Trends in number of people participating and number of participation days for selected outdoor recreation activities in the United States, 1999-2008[75]

Activity	Total U.S. Participants (1,000s), 2005-2008	Percent Change in Participants, 1999-2001 to 2005-2008	Total Annual Participant Days (millions), 2005-2008	Percent change in Total Days, 1999-2001 to 2005-2008
Developed Camping	52,021	2.7	532.3	9.3
Primitive Camping	33,330.2	-2.0	310.4	12.1
Backpacking	22,077.0	-0.6	277.7	24.0
Picnicking	115,836.2	-1.4	779.7	-17.2
Viewing Natural Scenery	145,489.2	14.1	11,482.3	60.5
Visiting Historic Sites	92,920.8	-4.5	590.8	-15.2
Nature Center Activities	127,406.5	5.0	1,044.0	23.2
Drive Off-road	44,231.3	18.6	1,349.6	56.1
Driving for Pleasure	111,069.0	3.1	2,637.3	-1.1
Snowmobiling	8,328.2	-29.7	92.7	-27.4
Day Hiking	74,032.5	6.8	1,993.4	-20.9
Horseback Riding (trail)	15,262.6	-8.2	278.3	-35.2
Bicycling	91,225.5	7.7	-	-
Kayaking	12,480.5	63.1	76.1	29.4
Downhill Skiing	15,615.4	-14.8	126.4	-15.7
Cross-country Skiing	4,970.7	-39.2	58.8	-7.8
Gathering Forest Products	71,023.3	16.1	869.3	1.9
View or Photograph Birds	81,119.9	19.3	8,039.0	37.6
Viewing Other Wildlife	114,792.0	21.3	5,341.6	46.9
Mountain Climbing	11,811.2	-12.5	104.1	20.5
Visit a Wilderness	70,591.9	3.0	1,108.6	12.8

According to Cordell, "quiet" recreation activities show strong growth, and they are predicted to become even more popular (such as viewing natural scenery, hiking, bicycling, kayaking, viewing wildlife). Other quiet activities are becoming less popular (such as horseback riding, primitive camping, cross-country skiing). Such trends may represent a reordering of priorities (Cordell, Betz et al 2008).

Regional Recreation Trend Projections

The following tables display trends for dispersed recreational activities in the Pacific Region (Washington, Oregon, California, Alaska and Hawaii). Table 3-99a shows a baseline figure of the number of *participants* in the Pacific Region for each activity, and projected growth index for 2010, 2020 and 2050. Table 3-99b - displays the same activities, listing the number of *days* participated and projected growth indices for the same years.[76]

[75] *Excerpted from Cordell, Betz et al 2008. Source: NSRE 1999-2001 (n=52607) and 2005-2008 (n=19,186). Note: 1999-2001 participants based on 214.0 million people age 16+ (2000 Census). 2005-2008 participants based on 230.0 million people age 16+ (2006 Census estimate). Missing data indicate that either participation or annual days were not collected during that time period.*

[76] The data displayed in Table 3-99a and Table 3-99b represent a subset of all recreational activities covered in this study, and apply to the Pacific Region in general, not just to recreation activities on National Forests. See the study for more details regarding study design, projection parameters and assumptions (Cordell et al. 1999: 326-349).

Table 3-99a Participation in some dispersed recreation activities in the Pacific Region, and projection index for participation in 2010, 2020 and 2050 (Cordell et al. 1999:326-349).

Activity	1995 Participants	2010 Projection index	2020 Projection index	2050 Projection Index
Hiking	10,900,000	1.23	1.34	1.85
Biking	9,800,000	1.19	1.29	1.65
Horseback Riding	2,400,000	1.18	1.29	1.77
Primitive Camping	5,600,000	1.13	1.23	1.44
Fishing	7,500,000	1.12	1.20	1.38
Hunting	1,700,000	0.85	0.79	0.64
Developed Camping	8,800,000	1.19	1.32	1.73
Off-Road Driving	4,700,000	1.10	1.20	1.33
Picnicking	15,800,000	1.2	1.31	1.63
Sightseeing	18,500,000	1.26	1.42	1.87
Wildlife viewing/photography	16,700,000	1.23	1.37	1.77

The projection index represents the percent increase in the number of participants expected for that activity for a specific decade in Table 3-99a and the percent increase in the total number of days participated attributed to the activity in the Pacific Region in Table 3-99b . Multiplying the projection index with the 1995 baseline gives the projected growth in participation and the projected growth for the total number of days of dispersed recreation anticipated for a given activity.

Table 3-99b - Number of days of some dispersed recreation activities in the Pacific Region, and projection index for participation in 2010, 2020 and 2050 (Cordell et al. 1999:326-349).

Activity	1995 Participants - Days	2010 Projection index	2020 Projection index	2050 Projection Index
Hiking	192,800,000	1.20	1.31	1.62
Biking	400,900,000	1.16	1.24	1.55
Horseback Riding	76,700,000	1.10	1.21	1.70
Primitive Camping	57,500,000	1.26	1.46	2.08
Fishing	119,100,000	1.16	1.25	1.44
Hunting	36,000,000	0.95	0.96	0.81
Developed Camping	92,900,000	1.23	1.39	1.88
Off-Road Driving	98,900,000	1.09	1.13	1.42
Picnicking	180,400,000	1.21	1.35	1.62
Sightseeing	363,500,000	1.38	1.67	2.59
Wildlife viewing/photography	838,000,000	1.33	1.58	2.14

Recreation data for the Pacific Region found in these studies displays trends that could be expected for visitation on the Deschutes and Ochoco National Forests in the coming decades. According to these projections, sightseeing, followed by non-consumptive wildlife activities like bird watching, wildlife viewing and photography will account for the most recreation use in the future, with picnicking, hiking, biking, developed camping, fishing, primitive camping, off-road driving, horseback riding, and hunting following.

This data also indicates that people participating in non-consumptive wildlife activities spend more days participating in their activity than do other recreationists. Heavy growth in the demand for sightseeing (87% increase by 2050), hiking (85% increase by 2050), and non-consumptive wildlife activities (77% increase by 2050) could be expected. The demand for off-road driving is projected to increase by about 20% by 2020. The data suggests the demand for activities that favor semi-primitive non-motorized settings both summer and winter will be heaviest in the future, competing with an also growing demand for semi-primitive motorized settings for off-road vehicle use. It is important to note that recreationists often participate in more than one activity during any given outing, and could be represented more than once in the preceding data.

Communities of Interest

Based on the comments received and the primary social factors people have indicated as important to them, "communities of interest" were identified to facilitate the evaluation about common attitudes, beliefs, and values of a collection of individuals an the impacts of management change on these factors. These groupings greatly simplify the members' actual values, beliefs, and attitudes. Individuals can belong to diverse communities of interest. The groupings identified are motorized and non-motorized recreationists, aging and physically challenged users, environmental advocacy groups, and adjacent landowners/residents.

Motorized Recreationists

Although as noted earlier, recreationists that use a motor vehicle for recreation access fall across a wide spectrum of users, for the purposes of this analysis, this analysis will focus on OHV users. Based on comments received during the planning process, and in the discussions of the Travel Management Subcommittee and Working Group, OHV users participate in their activities as a way for their family and friends to enjoy the backcountry scenery together and the challenge of traveling across varied terrain. These users enjoy their activities for many of the same reasons that non-motorized recreationists enjoy theirs – the chance to enjoy the beauty of nature, challenge of nature, and enjoy the solitude of the Forest. Some users feel they are being forced off of public land by more restrictive rules and regulations, and that responsible users are punished for those that are not responsible. As noted during the Travel Management Subcommittee and Working Group discussions, they feel there are a few irresponsible users that are out there, but the majority are not. These comments and beliefs were shared by the findings of the BLM in Montana and the Dakotas (USDI 2008). Many of the local organized motorized groups such as the Deschutes 4-Wheelers, or the Ochoco Trail Riders and the Central Oregon Motorcycle and ATV Club (COMAC), feel that their value of the ecological integrity of the forest is well demonstrated by their contributions of hundreds of volunteer hours to clean up garbage dumps and pull weeds, as well as maintain motorized trails. These users generally are willing to share the areas they use with other motorized and non-motorized users, although there is also a recognition that shared motorized trails may not be compatible in some instances for a number of reasons. Many motorized users expressed the belief that, given the limits on natural resources, all users should practice more tolerance of others

Based on comments received throughout the travel management planning process, motorized users share concerns about loss of access to areas traditionally used for these activities, and localized damage from OHV use being used to justify restrictions across the forest, instead of only where there are problem areas. People are concerned that this represents a continuing and increasing trend for limiting motorized access. OHV users generally also supported motorized access for game retrieval, hunting, and disabled and aging access. Some hunters indicated a concern that loss of ability to access traditional hunting areas with an OHV would mean they could not hunt at all. According to SCORP survey data (Oregon Parks and Recreation Department 2008) 25 percent of all hunters in Oregon use OHVs for their hunting experience. Recent research on OHV recreation found that OHV users were about three times more likely to participate in the three types of hunting (big game, small game, and migratory bird) than the general public. In fact, this same research shows that, as a whole, OHV users participate at more than twice the national rate (RECSTATS 2008).

The attitudes, beliefs, and values of this community of interests that would be affected by the proposed actions is reflected in how their activities might be affected. Key indicators include:

- the amount of motorized access available on and off designated routes and amount of motorized access for dispersed camping which affect the opportunities available for motorized access for viewing, family experiences, hunting, gathering, solitude, experiencing the challenge of nature, safety and crowding on designated routes

Non-Motorized Users

Based on many comments received during the travel management planning process, a prime motivation of non-motorized users appears to be a quiet, peaceful experience in beautiful surroundings in a natural forested setting. Many people who generally classify themselves as non-motorized users are also primarily looking for the challenges that the Forest can provide for a particular sport, such as rock climbing or mountain biking. Some users have indicated that there are fewer and fewer places to get away from it all, and feel it is important to protect that peace and quiet where it is still available.

Non-motorized users concerns are mainly, although not exclusively, associated with incompatibility with motorized uses. Non-motorized users expressed their concerns about OHV noise, the smell of exhaust, dust, and safety. They were concerned about the impacts of OHV use on wildlife and other resources. They were concerned with being displaced from areas because of the increasing motorized use, even with the ability to "win back" some areas from which they have been displaced because of motorized use. Some hunters, especially bow hunters, and the Oregon Department of Fish and Wildlife, believe there are greater benefits to a high-quality hunt if motorized access is limited to a few designated routes. In central Oregon, this is demonstrated by a number of popular hunting units that have had limited motorized access during big game hunting seasons as a result of cooperative agreements between landowners and the Oregon Department of Fish and Wildlife (these are also known as the "Green Dot" system).

The attitudes, beliefs, and values of this community of interests that would be affected by the proposed actions is reflected in how their activities might be affected. Key indicators include:

- the amount of motorized access available on and off designated routes and the conditions for motorized access for dispersed camping which affect the opportunities available for viewing, peace, quiet and solitude away from the noise, dust, and disturbance of motorized uses when camping, hunting, gathering, viewing, or using non-motorized trails
- the amount of area with designated non-motorized trails that are also open to motorized access off of designated routes that affect the potential for conflicting uses of non-motorized trails

Aging and Less Physically-able Population

As noted earlier, the population of central Oregon is aging, and this reflects a trend common to all states (Campbell 1996). The percentage of persons under 20 years of age will decrease and the percentage of population over 65 will increase over the next 30 years. The available research indicates that participation in outdoor activities change as people age. However, it is unclear how recreation choices will change as the baby boomer generation ages. As Hornback (1991) indicates, "Though aging is the prime social trend of the next two decades, we have little understanding of how the leisure sequence unfolds as people age…." In central Oregon, there are many of older and retired people from this generation that are very physically fit and are advocates for non-motorized recreation. Several comments were shared with the Forest Service during this planning process also reflected a concern that the needs and desires of the older population should be considered, and that closing areas to motor vehicle travel would restrict access for older and less physically-able people to activities such as hunting, fishing, and sightseeing.

The attitudes, beliefs, and values of this community of interests that would be affected by the proposed actions is reflected in how their activities might be affected. Key indicators include:

- the amount of motorized access available on and off designated routes which affect the opportunities available for motorized access for viewing, family experiences, hunting, gathering, solitude, safety and crowding on designated routes
- the distance from an open designated route which affects the amount of land that may be accessible with a motor vehicle for hunting and gathering
- the amount of area available for motorized access for dispersed camping which affect the opportunities for traditional family camping, hunting, gathering, and viewing

Environmental Advocacy Groups

Based on the comments received during the travel management process, environmental advocacy groups and associated individuals tend to support a more restrictive policy for motorized use and most expressed that use should be restricted to designated routes if allowed at all. The condition of resources on public lands is important to these groups because they value the resources for recreation, wildlife, and scenic and spiritual qualities. They are concerned that motorized use – especially unregulated off-highway vehicle use - has and will continue to contribute to resource damage and degradation such as erosion or disturbance, air and noise pollution, disturbance to other recreationists and native plant communities, the spread of invasive weed populations, and wildlife habitat destruction and fragmentation.

The key attitudes, beliefs, and values of this community of interests that would be affected by the proposed actions is reflected in how their activities might be affected. Key indicators include:

- the amount of motorized access available on and off designated routes which affect environmental conditions such as soils, riparian and upland vegetation conditions, or wildlife habitat disturbance or modification
- the amount of area available or conditions for motorized access for dispersed camping which affect environmental conditions

Adjacent Landowners and Residents

Wildland Urban Interface areas, are defined as an approximately 1.5 mile area surrounding communities that have common boundaries with National Forest lands. These acres indicate areas that were identified for high fire risk due to their proximity to communities that are adjacent to National Forest lands. There are approximately 260,350 acres of Wildland-Urban Interface on the Deschutes National Forest, which comprise about 16% of the total Forest acres. There are approximately 24,929 acres of Wildland-Urban Interface on the Ochoco National Forest, which comprise about 3% of the total Forest acres. These acres indicate areas that were identified for high fire risk due to their proximity to communities that are adjacent to National Forest lands. The acreage gives an indication of the amount of Forest lands that would affect adjacent landowners and residents. These are lands and acreages that have particular importance as earlier noted for both motorized and non-motorized access by residents within the communities. These areas also represent the National Forest lands that are “close-in” to urban and rural residential areas (including resorts and other recreation developments), and thus may have higher potential for conflicts between users.

Many people who live in these communities own OHV’s and/or other classes of motor vehicles that they use to access the adjacent Forest lands currently open to travel off designated routes directly from their homes. Based on observations from field personnel and comments from residents, many of these motorized users purchased their homes in these specific communities because of the open motorized access to National Forest lands. There are also landowners in some of these subdivisions who purchased their homes to enjoy the solitude that the Forest can offer. These landowners are often opposed to motorized access off designated routes adjacent to their lands because of impacts from noise, dust, and sometimes inadvertent trespass.

In addition to motorized access from private lands or communities adjacent to National Forest lands, those

adjacent lands are often open to motorized access for dispersed camping. In some cases, motorized dispersed camping adjacent to private lands causes disturbance or conflict with private land owners from garbage, abandoned campfires (adding to wildfire risk), noise, and sometimes trespass.

As noted earlier, many people live and work in central Oregon because of the proximity to public lands. Although this has been true for many decades, the trends in the amount of rural residential landowners are increasing, while the larger landowners such as industrial timberland owners and large base ranches have diminished.

This trend has increased over the last decade. Recent electronic poles conducted by Deschutes County as a part of their Comprehensive Plan Update, indicated more than 50 percent of the population of the southern portion of the County – which is surrounded by National Forest lands – have been in the area for less than 5 years. This influx of populations into these rural residential areas all indicated that a natural scenic setting and access to public lands were an important part of their decision to live in that area. A coalition of homeowners in the south Deschutes County area has formed called the Deschutes River Coalition. They have created a non-profit organization that is focused around helping to resolve problems associated with residential life in an Urban-Wildland interface such as that on the upper Deschutes River. This reflects the value that many residents adjacent to public land share for maintaining the scenic and ecological integrity of the land, and also reflects their perception that the management of that land for many purposes is more important to them because they live there. They believe that they have an important role as stewards of the land because of their proximity, and often believe they have the most knowledge about activities that damage forest resources.

These people reflect the mix of concerns of both motorized and non-motorized recreationists, as well as environmental advocates and the aging and less physically-able population. Rural residents concerns about access are more directly tied to their access from their homes to National Forest lands and also their ability to drive OHVs between neighborhoods or to local establishments, such as in the Crescent Lake Junction area. For large landowners such as Ochoco Lumber and ranchers on the Big Summit Prairie adjacent to the Ochoco National Forest, trespass, noise, and potential fire risk are all concerns that they feel as a result of the increase in OHV uses.

The attitudes, beliefs, and values of this community of interests that would be affected by the proposed actions are reflected in how their activities or lifestyle might be affected. Key indicators include

- the amount of motorized access available on and off designated routes within the Wildland-Urban Interface which affect the opportunities available for motorized access to National Forest lands or between communities from residences and the potential for trespass on private lands
- the amount of area available for and conditions of motorized access for dispersed camping within the Wildland-Urban Interface which affect the potential for disturbance to residents in communities adjacent to National Forest lands or for trespass on private lands

Basic Economic Conditions in the Study Area

In 2007, economists believed that Oregon's economy had recovered from the recession of 2001. Unemployment in Oregon grew from an average rate of 5.1 percent in 2000 to an average of 8.1 percent in 2003, but by 2005 the annual rate had fallen again to 6.1 percent. In the first five months of 2006, the rate ranged between 5.3 and 5.6 percent, while the national unemployment rate was between 4.6 and 4.8 percent. Competition for jobs intensified with the state's continued population growth. From 2000 to 2005 Oregon's working age population grew 7.6 percent, while employment grew 3.2 percent.

During the past twenty years, Oregon has been making the transition from a resource-based economy to a more mixed manufacturing and marketing economy, with an emphasis on high technology. Oregon's hard times of the early 1980s signaled basic changes had occurred in traditional resource sectors — timber, fishing, agriculture — and the state worked to develop new economic sectors to replace older ones. Most important, perhaps, was the state's growing high-tech sector, centered in the three counties around one of the primary metropolitan areas,

Portland. However, rural Oregon counties were generally left out of any shift to a new economy. When the boom of the 1990s collapsed, Oregon was again confronted with high unemployment, problems of hunger, and a diminishing safety net of social services. As of 2006 Oregon, ranked 22nd in the nation for hunger (Oregon Blue Book http://bluebook.state.or.us/).

In 2008, Oregon, and the United States as a nation entered a recession. The overall economic downturn is affecting recreation, and OHV use, in Oregon.

Economic Contributions of Travel and Tourism

Travel and tourism is becoming an increasingly important economic contributor to the central Oregon region. The contribution of this sector may demonstrate the values of public lands as a setting that attracts and retains people who want to live in adjacent communities for quality of life reasons. According to County Business Patterns, in 2006, the travel and tourism industry contributed 6% of the total jobs to the economy (excluding proprietors and government) in the four-county area. That compares to 4.9% in the U.S. as a whole. Over the last 8 years, travel and tourism employment in the region has grown by 36.5%, which is faster than the nation as a whole.

Table 3-100. Jobs in 2006.

	Deschutes OR	Crook OR	Jefferson OR	Klamath OR	Region	Oregon	United States
Total Timber Related	2,060	1,253	1,938	1,789	7,040	49,678	1,124,528
Mining	62	63	7	29	161	1,939	554,333
Travel & Tourism	3,735	238	461	944	5,378	68,291	5,845,290
All Other Jobs	54,610	4,092	1,985	16,203	76,890	1,341,752	112,392,849

Within the region, Deschutes County has the most travel and tourism jobs (3,735). The least numbers of jobs are in Crook County (238). Together, the region employs 7.9% of all travel and tourism jobs. Within the region, Jefferson County has the largest share of travel and tourism jobs (10.5%). The lowest shares of jobs are in Crook County (4.2%). Together the region's share is 6.0%, 1.3% higher than the state's share of the total (4.7%). From 1998 to 2006, the four-county area gained travel and tourism jobs, and lost none. During that time period, Deschutes County gained the most travel and tourism-related jobs (1062), while Klamath County gained the least (48)[77]

Travel & tourism jobs in Deschutes County were somewhat high (0.4 standard deviations from the median). 3,735 people were employed which accounts for 6.0% of the economy. Nationwide, its share had a rank of 296 which puts it in the top 10.0% of all counties. As a share of total, travel & tourism jobs in Crook County were roughly average (0.0 standard deviations from the median). 238 people were employed which accounts for 4.0% of the economy. Nationwide, its share had a rank of 1,376 which puts it in the top 44.0% of all counties. As a share of total, travel & tourism jobs in Jefferson County were high (1.3 standard deviations from the median). 461 people were employed which accounts for 10.0% of the economy. Nationwide, its share had a rank of 168 which puts it in the top 6.0% of all counties. Travel & tourism jobs in Klamath County were roughly average (0.1 standard deviations from the median). 944 people were employed which accounts for 4.0% of the economy. Nationwide, its share had a rank of 817 which puts it in the top 27.0% of all counties.

Economic Contributions of Recreation Use

Recreation use and the contributions of those uses to the economies of the central Oregon region, the state and the nation are becoming increasingly important. The employment and labor income effects stemming from current recreational activities occurring on the Forest are estimated based on the expenditure of the users engaged in the recreational activities on the Forest. The NVUM survey collected information regarding user spending within 50

[77] Based on EPS Report on Travel and Tourism for Deschutes, Crook, Jefferson, and Klamath Counties

miles of the National Forest boundary. Users reported expenditures for various activities such as groceries, restaurants, gas and lodging. The specific spending profiles and expenditures are documented in Stynes and White (2004). These expenditures are used to identify the contribution of recreation use on the Forest to the economy of the study area. Response coefficients that identify employment and labor income effects per 1,000 recreation visits are provided to indicate the difference in various management options that could affect the amount of activity use. Appendix B-8– Deschutes and Ochoco National Forest TMECA Economic Contribution Report for the planning area display the expected economic contributions of activities on the Deschutes and Ochoco National Forests. For the Deschutes, of those activities surveyed, the largest income producing activity is hiking/walking, with a total labor income of over $3,000,000; while on the Ochoco National Forest it is horseback riding with a total labor income of just over $450,000.

Information obtained from the Oregon Parks and Recreation Department indicates that OHV use rapidly gained popularity. In 1997, there were 3.9 million all-terrain vehicles (ATVs) nationally and two million off highway motorcycles (OHMs). In 2002, there were 800,000 ATV sales and 300,000 OHM sales, almost 2,200 ATVs per day. During this period sales increased 171 percent in the western states. The overall 3rd quarter 2008 Motorcycle sales figures reported include motorcycles, scooters and ATVs. Total sales year to date (YTD), from January to September of 2008 were down 10.7% compared to 2007, brought down by another 25% decrease in ATV sales. ATV sales have dropped approximately 25% each quarter this year when compared to 2007. Dual sport sales were up 29.4%, proving that this segment remains extremely popular with American motorcyclists. Sales were 39,805 YTD compared to 30,759 by Q3 of 2007. Off highway motorcycle sales continue to suffer; down 24.9% YTD with 114,174 sold YTD compared to 152,086 by the end of Q3 in 2007.

Comparing December 2007 to December 2006, sales of off-road bike were down 27.7%; street bikes were down 19.7%; scooters were down 21.1% and all motorcycle categories combined were down 23.2%. ATV sales were also off 28.3% (webBikeWorld)

In July 2007 Dave Crocker of Power Products Marketing reported that US sales of traditional brand ATVs were currently in their third consecutive year of decline. While some analysts might attribute this to the increasing number of Chinese imports that have flooded the market in recent years it has also become apparent that another trend is having a significant impact on ATV sales.

Over the last three years an increasing number of older buyers are trading in their ATVs and opting for the more appealing utility vehicles or “side-by-side vehicles” as they are often called. Surveys conducted by Power Products Marketing indicate that as much as 10% of annual ATV sales are lost to competing utility vehicles. (Power Products Marketing, Dave Crocker July 2007) These sales trends point to an increasing demand for OHV recreation activities.

OHV trip-related expenditures in the state of Oregon during 1999 were estimated at $46.4 million. Oregonians made $29 million in trip expenditures while non-resident visitors made $17.4 million in trip expenditures during the year. Nearly $3.2 million was spent in the Central Oregon Region. OHV trip expenditures created an additional 831 jobs and $14.6 million in personal income in Oregon. The study found an average per person per day OHV trip expenditure of $29. Other recreation activities, like snow play ($45), fishing ($31), and camping ($18) have average trip expenditures above and below this amount.

NVUM reported on a substitute choice made by OHV users if they had been unable to use National Forest System lands. About 64% of visits with the primary purpose of OHV use in the Pacific Northwest Region (R6) responded that they would have gone elsewhere for the same activity (English, Kocis and Hales 2004).

The 2004 Oregon Statewide Motorized Trail Use Survey revealed that OHV enthusiasts are willing to travel reasonably long distances to use their OHV’s (Bergerson et al 2005). The median distance traveled to reach an OHV riding opportunity falls in the range of 41 to 50 miles; and, nearly one-fifth of OHV users travel more than 100 miles.

The Blue Ribbon Coalition, which is "a national, non-profit organization dedicated to preserving responsible recreational access to public lands and waters," has written about OHV use and the economy. The non-profit published an editorial on its website, "What to do in this Trying Economy." The editorial states that "Fuel prices are killing us [OHV users]. Everything is costing more than ever before. Event attendance is down. Off-road businesses are going under." The article implies that these trends – declining event attendance and the failures of off-road businesses is related to the economy.

In response to the economic difficulties, the editorial suggests riding OHV's closer to home. It also suggests trying other forms of recreation, including walking in the park. The editorial also stresses the importance of supporting OHV businesses. The author says, "… if they [OHV businesses] start to fail because we are not buying parts, then we [OHV users] jeopardize our future to some extent." In several places in the article, the author suggests spending time and money closer to home. The article even suggests watching movies about OHV recreation and getting friends together to wash their OHV as a group (http://www.sharetrails.org/magazine/article.php?id=1636).

Analysis of Environmental Effects

Social Effects

Attitudes, Beliefs, and Values

The key indicators of the effects of the proposed actions on the attitudes, beliefs and values of the different communities of interest are:

- the potential motorized and non-motorized recreation uses and trends;
- acres open to motorized access off of designated routes – including those acres open within the "wildland-urban interface" areas adjacent to other landowners;
- acres open to motorized access for dispersed camping and conditions of motorized access for dispersed camping
- the likely effects of these actions on the attitudes, beliefs, and values of the communities of interest based on how their activities would be affected by the Alternatives and the relationship of those activities to their values.

As described by the key indicators above, people's attitudes, beliefs, and values would be primarily affected by the change between the current condition described in Alternative 1 for motorized access off designated routes, and the actions that are common to Alternatives 2 and 3, which would prohibit motorized access off designated routes in all areas that currently do not prohibit motorized access off designated routes. As displayed by the summary in Chapter 2, this accounts for a change to motorized access off designated routes on about 39% of the Deschutes National Forest, and about 60% of the Ochoco National Forest. Similarly, the change between Alternative 1 and the actions common to Alternative 2 and 3 which would prohibit motorized access for dispersed camping more than 300 feet from an open designated route, and change the conditions under which motorized access for dispersed camping would be allowed within 300 feet of an open designated route would also affect people's attitudes, beliefs, and values. However, the change in motorized access for dispersed camping would, from a practical standpoint, be unlikely to actually affect as much acreage as it appears when comparing the numbers in the comparison chart in Chapter 2 (currently there is approximately 72% of the Deschutes and 69% of the Ochoco open or open seasonally to motorized access for dispersed camping; Alternatives 2 and 3 would reduce the area available by about 46% on the Deschutes and 52% on the Ochoco). This is because most motorized access for dispersed camping is relatively close to the current system of open designated roads. Approximately 70% of the known inventoried dispersed sites on the Deschutes and 80% on the Ochoco are within 300' of an open designated road. While this is not based on a comprehensive inventory of all dispersed sites, the sample is robust enough to give a relative sense of the likely magnitude of the potential effect. The differences between Alternative 2 and 3 are relatively less than the change proposed between Alternative 1 and Alternatives 2

and 3, and are focused solely around applying the special provisions for motorized access for dispersed camping to all routes open for motorized access for dispersed camping under general provisions only. This change would have more potential impact on those people who prefer motorized access for dispersed camping in dry upland areas that have no evidence of previous use. Overall, the motorized access changes proposed in Alternatives 2 and 3 would reduce conflicts between motorized and non-motorized users, and reduce conflicts between private landowners and forest recreationists. The changes would also reduce people's ability to access National Forest lands from adjacent private lands, and would reduce the potential for inadvertent trespass from motorized access to landowners adjacent to National Forest lands.

Effects Common to All Alternatives

There would be no change to the areas that are currently closed to any kind of motorized access under any of the Alternatives. Chapter 2 includes a more detailed description of the motorized access conditions that would not be affected by these decisions for the Forest as a whole. Under any Alternative, there would be expected to be a continued increase in population and resultant demand for recreation and access to the National Forests by all of the identified communities of users. There is also expected to be a continued increase in residential and resort development adjacent to National Forest lands, although at some reduced rates when compared to the past five years due to the current economic recession. Although none of the Alternatives would designate or eliminate motorized routes, none of the Alternatives would preclude the development or elimination of any existing designated route in the future.

Alternative 1

Alternative 1 has the greatest amount of land that does not prohibit motorized access off designated routes or motorized access for dispersed camping of all of the Alternatives, although understanding where and under what conditions motorized access is allowed is cumbersome. This is because regulations vary widely across any given area and there is seldom sufficient signing maintained to cover the variety of areas with site-specific regulation regarding motorized access. The general perception of motorized access on National Forest lands is that they are "open" to motorized access unless posted "closed." This perception has been enhanced by the federal Courts, who are often reluctant to penalize motorized users that are in areas that may be closed to motorized access unless evidence is provided that those areas are clearly posted closed. Signing of areas "closed" to motorized access is challenging, because signs are often vandalized or removed. However, under current policy and Forest Plan guidance, motorized access off of designated routes is prohibited in a number of places as shown on the map: Alternative 1 – Motorized Access Off Designated Routes. Table 2-3 – Comparison of Alternatives (Chapter 2) displays the acres available under Alternative 1 for motorized access off of designated routes.

An illustration of the current variety of motorized access prohibitions on the two Forests demonstrates the challenge of understanding the regulations related to motorized access on the two Forests. All of the Crooked River National Grassland on the Ochoco National Forest and the Old Growth Management Areas are closed to all motorized access off of designated routes, including motorized access for dispersed camping. The Newberry National Volcanic Monument is closed to all OHVs both on and off designated routes, and is closed to all motorized access off designated routes, except that motorized access for dispersed camping is not prohibited outside of the Crater Management Area. The East Ft. Rock OHV Trail system is closed to OHVs off of the designated trail system, but motorized access to highway-licensed vehicles is not prohibited off designated routes. On both Forests all Research Management Areas are closed to all motorized access, except that in some cases there are open roads in those areas. In addition to these broad-scale regulations regarding motorized access, there are numerous localized closure orders to motorized access off designated routes, or to motorized access. These may be temporary because of resource damage or protection, or permanent seasonal or year-round closures to either specific types of vehicles or all motorized access such as for hunting season or to protect soils. Examples of these temporary closures are the McKay Creek and South Boundary areas on the Ochoco National Forest, and the B&B and Davis Fire areas on the Deschutes National Forest. These areas are prominently signed at the entry point to the areas. The Opine Travel Management Area on the Deschutes National Forest has a localized closure for

motorized access off of all designated routes year round and two seasonal use periods for motorized access on designated routes. There has been an increasing trend in the last decade to temporarily close localized areas to motorized access or to OHVs off designated routes because of concerns for resource protection (numerous closures in wildlfire areas such as the Skeleton, B&B, Davis, Hash Rock) or as a result of resource damage (McKay, Ann's Butte). If motorized use continues to increase as predicted, Alternative 1 would likewise result in a continued increase in this trend of signing and localized closures. This could result in a perception by motorized users of an increasing amount of regulation of their uses, and a continued reduction in areas that are open to motorized access off of designated routes incrementally over time.

Effective management of continuing an "open unless posted closed" approach to motorized access regulation could result in a proliferation of areas that are signed for closure across the Forests. Although more acres would be open to motorized access under Alternative 1 for a variety of purposes than any of the other alternatives, the appearance of regulated access could eventually be more prominent than under Alternatives 2 or 3.

Effects on Community of Interests

Motorized and Aging and Less Physically-Able Users

Motorized Access on Open Designated Roads

Alternative 1 would have no changed effect on this community of interests on existing designated open roads or motorized trails. The current system of identifying which roads are open and closed to motorized access is also challenging. In general, all motorized access on open roads is subject to the provisions of Oregon State law. From a practical standpoint, Central Oregon Combined Off-Highway Vehicle Operations (COVOPS), a combined Forest Service and Bureau of Land Management organization that is primarily responsible for managing the designated motorized trail systems in central Oregon, has published some guidance that describes what Forest Service roads are open or closed to non-highway legal motor vehicles. There is currently no single map that clearly identifies the designated roads open to motorized access by the class or type of vehicle (highway legal or non-highway legal) allowed on that road and season of use of the road. In some cases, signing does establish closures to certain class or types of vehicles and seasons of use. Typically, users that encounter the barrier of roads that are for highway legal vehicles only that are between existing routes that allow for non-highway legal vehicles (if they understand they are not allowed to use a route), will go around and create an unauthorized trail if the vegetation and topography allow, or sometimes use a road that may be closed. Some OHV users have commented that, unless a road is paved, it is not clear to them that they cannot use the road.

Motorized Access On and Off Designated Routes and Motorized Access for Dispersed Camping

As illustrated in the Alternative Comparison Table in Chapter 2, about 39% of the Deschutes and 60% of the Ochoco would not prohibit motorized access off of designated routes under current laws, policies, and regulations; and would allow for motorized access for dispersed camping on about 72% of the Deschutes and 69% of the Ochoco National Forests in Alternative 1. This would provide the greatest potential benefits to the communities of users for whom values are fulfilled by a greater area where motorized access off of designated routes and dispersed camping may be allowed, and would provide the most potential motorized access to areas of special value to motorized users and less physically able users.

Alternative 1 would have the greatest amount of area available for motorized access opportunities for solitude and to seek out the challenges of nature and natural topography, whether individually or with family members; and to pursue activities from a motor vehicle such as hunting and gathering. Alternative 1 would offer the most opportunities for utilizing a motorized vehicle to explore and discover parts of the forest that are new or especially valued, sometimes thought of as "secret" areas, with, perhaps, little evidence of past uses. Alternative 1 allows the most opportunity for those that are less physically-able to access places they feel they could not access without a motor vehicle such as long-established special hunting grounds, and would allow this group of people the greatest motorized access for retrieving down game of any of the Alternatives.

The potential for conflicts to or within these user groups is relatively low in this Alternative. Although observations by field personnel and members of the Travel Management Subcommittee and Working Group indicate that the existing designated motorized trail systems are already overcrowded, the designated motorized road and trail systems would likely have the least potential for additional crowding under Alternative 1. Alternative 1 would offer the most opportunities for individual discovery, creation and utilization of unauthorized motorized trails in areas where motorized access off of designated routes is not now prohibited. Unless specific resource damage in an area were to be identified by the Forest Service, existing unauthorized trails would continue to be utilized and created, thus creating or maintaining more motorized access connections for dispersing motorized activities throughout the forest. Motorized vehicles could continue to utilize roads that are closed to public access if the area around the road was not otherwise closed to motorized access. Many motorized recreation users believe strongly in the concept of shared uses, and are generally tolerant of other motorized and non-motorized users on designated motorized roads and trails or unauthorized motorized trails.

Although motorized use is predicted to increase in the future, based on the NVUM data, OHV users are not currently shown to be or predicted in the future to be the majority of recreational users of the Deschutes and Ochoco National Forests.

Non-motorized Users and Environmental Advocates

Alternative 1 would continue to provide primary or exclusive non-motorized access to approximately 61% of the Deschutes 40% of the Ochoco National Forest. Of the three alternatives considered, Alternative 1 offers the least potential benefits to the communities of interests that value peace and quiet in areas that are away from designated roads, or dislike noise, dust, or environmental impacts associated with motorized access off of designated routes, or with more areas that would allow for motorized access for dispersed camping away from designated open roads. These users would continue to experience current and likely increasing levels of disturbance in areas where motorized access off of designated routes is allowed where that use overlaps with areas where they are seeking peace and quiet in the forest, and could ultimately result in more displacement of these users from areas they have identified that hold special value to them. Some advocates may also seek localized agency action to restrict uses where they feel that motorized access is causing resource damage or disturbance to wildlife, such as the actions pursued by the “Friends of McKay” to have the McKay Creek area on the Ochoco National Forest closed to all motorized access off of designated routes.

The potential for conflict in Alternative 1 with these user groups is very high. Many non-motorized users feel there is currently a high level of conflict because motorized users are using non-motorized trails in areas that do not prohibit motorized access off of designated routes, and that their experience is ruined by the evidence of past use, or the sounds and other disturbance of actual trail encounters. Based on field personnel observations, motorized access for dispersed camping increasingly involves OHV uses in and around dispersed campsites, which disrupts the peace and quiet that non-motorized users seek when dispersed camping. As noted earlier, non-motorized users and environmental advocates tend to be more susceptible to conflict from motorized users, and are less tolerant of these other uses, especially those that are fast, loud, and leave behind environmental disturbance from their activities.

Alternative 1 would have the greatest potential impact on the environment, and would therefore be the least compatible Alternative for the attitudes, beliefs, and values of this community of interest. Based on projected recreation use trends, non-motorized users are likely to increasingly be in the majority in the central Oregon area.

Adjacent Landowners and Residents

Motorized Access On Designated Routes

Most motorized access on designated routes within the Wildland-Urban Interface would not change, although some change in motorized mixed use or increased signing of roads not open to OHV use would likely continue to increase. Many of these roads are currently major forest or county roads that do not allow for motorized mixed use.

Motorized Access Off Designated Routes & Motorized Access for Dispersed Camping

On the Deschutes National Forest, of the approximately 260,343 acres within the Wildland-Urban Interface, approximately 30% is generally open to motorized access off designated routes and about 70% currently has some limitation on motorized access off designated routes. On the Ochoco National Forest, the mix is roughly the same with about 74% of the approximately 24,929 acres within the Wildland-Urban Interface on the Ochoco National Forest having some limitation on motorized access off designated routes. This includes all categories of motorized access off designated routes of closed to all motorized access, closed to motorized access off designated routes, closed to OHV access and closed to OHV access off designated routes. On the Deschutes National Forest, approximately 33% of the total Wildland-Urban Interface has some restriction related to motorized access for dispersed camping, while about 57% of the Ochoco National Forest has some restriction related to motorized access for dispersed camping within the Wildland-Urban Interface. This includes areas closed to all motorized access or areas closed to motorized access for dispersed camping. Motorized access for dispersed camping along the Upper Deschutes and Metolius Wild and Scenic Rivers on the Deschutes National Forest (about 9,839, less than 1% of the Forest), is only allowed in designated sites.

Population and rural residential development trends in lands adjacent to National Forest lands in the four-county area indicates a continued increase in the next decade. This would likely also result in an increase of new unauthorized motorized trails created for access from private land parcels or communities onto Forest Service lands for a variety of activities in Alternative 1. Conflicts between those who bought these homes and lands to be able to access National Forest lands with a motor vehicle compared to those who purchased the lands for privacy, solitude, and the peace and quiet of the forest would continue and could increase in this alternative. For those who value the peace and quiet, as with the non-motorized user groups, motorized access off of designated routes and motorized access for dispersed camping from other National Forest users are likely to increase in Alternative 1.

The potential for future conflict with adjacent large landowners such as Ochoco Lumber or ranches is also high in Alternative 1, because user notification of motorized access off of designated routes would continue to be subject to clear signing requirements. Areas that are within the Wildland-Urban Interface that are currently open to motorized access also provide much higher potential for inadvertent trespass onto private lands unless they are well signed and posted. For those landowners who are opposed to motorized access off designated routes adjacent to their lands, impacts from that use would also likely increase and they would continue to be impacted from noise, dust, and potential inadvertent trespass.

Alternatives 2 and 3

Alternatives 2 and 3 would significantly reduce the amount of area open for motorized access off designated routes, to less than 1% of each of the two Forests. About 1% of each of the Forests would remain open to motorized access off designated routes (cross-country travel) in more than 200 designated areas across the two forests. Alternatives 2 and 3 would also substantially reduce the amount of area available for motorized access for dispersed camping by about 46% on the Deschutes and 52% on the Ochoco National Forest, although as noted earlier, most of this area is more than 300’ away from an open designated road and therefore may not materially affect motorized access for dispersed camping. The primary difference between Alternatives 2 and 3 would be additional limits on motorized access for dispersed camping to only existing, designated, or defined sites in upland areas, many of which may be adjacent to private lands.

Both Alternatives would result in a major change from the current perceived policy of "open unless posted closed," to "closed unless shown as open on the Motor Vehicle Use Map." Having one regulation that would be applied everywhere on all National Forests would be much easier for most users to understand and for managers and enforcers to explain than the myriad of regulations that apply currently on the Deschutes and Ochoco National Forest depending upon Forest Plan or other regulation or site specific policy. Road signing would become much more important for people to identify where they are, but they would not have to rely only upon signed areas to know if the area were closed or open to motorized access. Users would have a greater need to be able to read and understand a map to understand where they could drive a motor vehicle in Alternative 2 and 3 than in Alternative 1. Both Alternatives 2 and 3 would require users have in their possession and be able to read the Motor Vehicle Use Map in order to understand where motorized access is or is not allowed, including motorized access for dispersed camping. This would result in a more uniform application locally, regionally, and nationally of where motorized access is allowed, and thus ultimately make it easier for people to understand where motorized access is allowed. Overall, Alternative 2 and 3 would require an increased awareness and knowledge by all users of where a highway or non-highway legal vehicle may be allowed, both on routes and adjacent to routes that allow for motorized access for dispersed camping under the new conditions of use.

Alternatives 2 and 3 would be likely to result in fewer *localized* motorized use restrictions based on resource damage or conflicts with other resources than would Alternative 1, because more areas would be closed to motorized access. Alternative 2 and 3 would not eliminate temporary localized closures or other public use restrictions because of wildfire or other special conditions. These would continue to require signing to notify people of additional restrictions. Alternatives 2 and 3 would likely also continue to have signing for the cooperative hunting areas, since these areas are posted by the Oregon Department of Fish and Wildlife, but they would not have to be posted because the Motor Vehicle Use Map will show any seasons of use for open designated roads.

Alternatives 2 and 3 would reduce the miles of road that are open to motorized access for non-highway legal vehicles by about 3% on the Deschutes and by about 8% on the Ochoco National Forest.

Alternative 3 would have additional restrictions on motorized access for dispersed camping of limiting motorized access for dispersed camping to existing, designated, or defined sites everywhere motorized access for dispersed camping is allowed when compared to Alternative 2 which would only have those restrictions in riparian areas or upland areas with sensitive resources. This would make the map and regulations related to motorized access for dispersed camping easier to understand because the same provisions would apply everywhere. However, the trade-off would be additional restrictions on people's motorized access for dispersed camping.

Effects on Community of Interests

Motorized and Aging and Less Physically-Able User

Motorized Access on Open Designated Roads

Alternatives 2 and 3 would reduce the miles of road that are open to motorized access for non-highway legal vehicles by about 3% on the Deschutes and by about 8% on the Ochoco National Forest. As described in the Public Safety and Recreation section of this Chapter in more detail, that could affect some non-highway legal vehicle users that are traveling on designate roads if there are not alternate routes available that allow non-highway legal vehicles or motorized trails access. The amount and location of these roads as shown on the Motorized Mixed Use Map in Appendix A-2 is fairly minor, and would make motorized access to some areas inconvenient rather than eliminating all motorized access for most motorized users and aging and less physically-able users.

The Motor Vehicle Use Map that would be published for Alternatives 2 and 3 would also more clearly identify the open designated road system than Alternative 1, which relies on physical barricades, natural in growth, or posted signs to identify roads that have been put into storage and closed to motorized access or decommissioned.

As noted in Alternative 1, motorized users and aging and less physically-able users may have been using roads that are not open to motorized access. Many of these roads may have offered opportunities for motorized access for dispersed camping, hunting, or gathering. Alternative 2 and 3 would limit these opportunities to at least some extent. In Alternatives 2 and 3, more than 80% of the National Forests acreage is within ½ mile of an open designated route. Although this indicates a relatively small percentage of the total acreage of the two Forests that would not be accessible by an open road to this community of users, the signed, open designated road system that would be published on every Motor Vehicle Use Map would not necessarily offer the same value of self-discovery or primitive access opportunities as those areas they now access.

Motorized Access Off Designated Routes & Motorized access for dispersed camping

The effects of both of these Alternatives are equally unfavorable to the community of users that value undeveloped, primitive access off of designated routes – whether roads or trails – for motorized access opportunities for solitude and to seek out the challenges of nature and natural topography, whether individually or with family members; and to pursue activities from a motor vehicle such as hunting and gathering off of designated roads and trails. There would continue, under both of these alternatives, to be an extensive system of roads and motorized trails that provide for many challenging and primitive motorized experiences. These Alternatives would continue to provide benefits to motorized users that value the challenge trail riding, or the opportunity for a variety of difficulty levels of designated trails systems with friends and family more than those that prefer a more undeveloped motorized experience.

Alternatives 2 and 3 are more likely than Alternative 1 to contribute to the sense of crowding on the designated roads and trails and for motorized access for dispersed camping. Concentrating use into a smaller area could reduce the value that some trail riders experience, and could displace some users to public lands that are open to motorized access for dispersed camping. These Alternatives are likely to have a higher potential for conflict between motorized users because of the concentrated uses. Although there is a continued demand for expanded motorized trail opportunities across both Forests, especially for Jeep-type vehicles, the urgency of this demand and peoples' overall displeasure with the range of opportunities available to them is likely to be higher in Alternatives 2 and 3 than in Alternative 1.

Some additional opportunities for motorized access for dispersed camping on both the Ochoco and Deschutes National Forest would be available in Alternatives 2 and 3. In Alternative 1, all motorized access off of designated routes on the Crooked River National Grassland, and in some other "Travel Management Areas" such as the B&B, Opine, and McKay Creek area is currently prohibited, including motorized access for dispersed camping. Alternatives 2 and 3 would allow additional opportunities for motorized access for dispersed camping along most open designated routes on the two Forests, including the Crooked River National Grassland, and in the Opine, B&B, and McKay Creek Travel Management Areas, although the conditions for motorized access for dispersed camping would vary for Alternative 2 compared to Alternative 3. Alternatives 2 and 3 would represent an increased opportunity for motorized access for dispersed camping of about 70,000 acres (or about 4% increase) when compared with Alternative 1. Based on field personnel observation, many of these areas have been used for many years, and are highly valued areas for motorized access for dispersed camping.

Non-motorized Users and Environmental Advocates

Alternatives 2 and 3 would both benefit those values that have been expressed by non-motorized users and environmental advocates. Prohibiting motorized access off of designated routes and limiting the areas and conditions for motorized access for dispersed camping would add a substantial amount of natural area free of the evidence of motorized users, especially OHVs. Although there is only about 20 percent of the National Forest lands that are more than one-half mile from an open designated road, Alternatives 2 and 3 are likely to significantly reduce the conflicts between motorized and non-motorized trail users. As described in the other resource sections of this Chapter, most natural resources would be beneficially affected by the proposed changes

to motorized access in Alternatives 2 and 3, and these benefits would reflect those values identified by environmental advocates as well.

Alternative 3, because it would prohibit motorized access for dispersed camping in Inventoried Roadless Areas, would also favor those values that have been expressed by environmental advocate groups.

Adjacent Landowners and Residents

Motorized Access On Designated Routes
Approximately 9 miles of roads within Wildland-Urban Interface would change from mixed motorized use to highway legal vehicles only. This could have minor localized effects on residents. Similar to the effects of changing mixed use across the larger forest area, this change in road use is expected to be relatively minor.

Motorized Access Off Designated Routes
Under Alternatives 2 and 3, all motorized access to National Forest lands within the Wildland-Urban Interface would be restricted to designated routes and areas. This would reduce the sights, sounds, and other evidence of motorized users within the Wildland-Urban Interface and be very compatible with the values and lifestyles of landowners who purchased their land for peace and quiet and an undisturbed natural setting. For those landowners who value being able to access National Forest lands from their backyards, their ability to access National Forest with a motor vehicle would be reduced when compared with the current condition because all motorized travel would be on designated routes only. This would be less compatible with the lifestyle values identified by some members of this community of interest when compared with Alternative 1.

Motorized Access for Dispersed Camping

Alternatives 2 and 3 would prohibit motorized access for dispersed camping on approximately 124,926 acres or 48% of the total Wildland-Urban Interface on the Deschutes National Forest, and approximately 9,089 acres, or 36% percent of the total Wildland-Urban Interface on the Ochoco. Approximately 61,716 acres on the Deschutes and 2,926 acres on the Ochoco would allow for motorized access for dispersed camping either year-round or in seasonal use periods under the general or special provisions described in Chapter 2. Alternatives 2 and 3 would designate approximately 19,298 acres on the Deschutes National Forest, and about 3,105 acres on the Ochoco as open to motorized access for dispersed camping that are currently closed to that use either year-round or seasonally under the general or special provisions described in Chapter 2. Alternative 3 would limit all motorized access for dispersed camping to existing, designated, or defined sites. This would be a change from Alternative 2 for the Deschutes National Forest of approximately 42,418 acres that would only allow motorized access for dispersed camping to existing, designated or defined sites. On the Ochoco this would represent a change of approximately 1,445 acres that would only allow motorized access to existing, designated, or defined sites within the Wildland-Urban Interface.

Most adjacent landowners and residents prefer less acres open to motorized access for dispersed camping adjacent to their homes or land, because it would increase their valued sense of privacy and reduce the potential for conflicts associated with the sights, sounds, and evidence of other people that have used motorized access for dispersed camping. Risk of fire from untended campfires that could threaten their homes or lives would also be reduced when fewer acres are available for motorized access for dispersed camping. Alternative 2 and 3 would substantially reduce the acres within the Wildland-Urban Interface that are open to motorized access for dispersed camping when compared to Alternative 1. Alternative 3 would potentially even further reduce the amount of area that is actually used for motorized access for dispersed camping to just those existing, designated, or defined sites. However, there is not a complete inventory of dispersed sites in order to make any quantifiable comparison between Alternatives 2 and 3.

Economic Effects

Alternatives 1-3

None of the alternatives would significantly alter the range of recreation opportunities offered across the two Forests. OHV use is currently - and would be projected under all alternatives - to be a minor contributor to the overall recreation economy of the region. Although there is some economic data based on user surveys of the economic benefits of motorized access off designated routes by OHV users, the data clearly shows that the contributions of this use is not a significant economic factor. The degree to which this economic benefit would be affected by changing the amount of area available for these users is even less significant, since many users are, and will continue to be attracted to the areas motorized roads and trails, or come to experience other uses and only utilize their OHVs as a secondary activity. The economic contributions from activities which may be affected by changes in conditions for motorized access for dispersed camping such as driving for pleasure, or non-consumptive viewing of wildlife would not generally be affected.

Although some members of the public have said they will not hunt in an area with no motorized access, this is not anticipated to affect the overall economic contributions of hunting and fishing to the region's economy because many hunters and anglers, and wildlife watchers would continue to be attracted to areas that limit motorized access.

Effects on People with Disabilities

Under section 504 of the Rehabilitation Act of 1973, no person with a disability can be denied participation in a Federal program that is available to all other people solely because of his or her disability. There is, however, no legal requirement to allow people with disabilities use of motor vehicles on roads, trails, or other areas that are closed to motor vehicles.

Some comments received during the travel management planning process expressed concern that changes to motorized access would prevent future access to National Forest system lands for those with disabilities. In response to these comments, a review of the project alternatives was conducted. This review found that changes in motorized access apply equally to all groups of people, and is therefore not discriminatory towards persons with disabilities.

Civil Rights Impacts Analysis (CRIA)

USDA Civil Rights Policy

The Civil Rights Policy for the USDA, Departmental Regulation 4300-4 dated May 30, 2003, states that the following are among the civil rights strategic goals; (1) Managers, supervisors, and other employees are held accountable for ensuring that USDA customers are treated fairly and equitably, with dignity and respect; and (2) equal access is assured and equal treatment is provided in the delivery of USDA programs and services for all customers. This is the standard for service to all customers regardless of race, sex, national origin, age, or disabilities.

Disparate impact, a theory of discrimination, has been applied to the Travel Management Planning process in order to reveal any such negative effects that may unfairly and inequitably impact beneficiaries regarding program development, administration, and delivery.[78] The objectives of this review and analysis are to prevent disparate

[78] For more information on disparate impact theory, see The Evolution of Disparate Impact Theory of Discrimination, *Harvard Journal of Legislation, vol. 44 2007* (http://www.law.harvard.edu/students/orgs/jol/vol44_2/gordon.pdf)

treatment and minimize adverse Civil Rights impacts that may have caused an effect of discrimination against minorities, women and persons with disabilities and to ensure compliance with all Civil Rights statutes, Federal regulations, and USDA policies and procedures.

Civil Rights Monitoring and Evaluation

It is the responsibility of the Deputy Chiefs for National Forest Systems to ensure that decision-makers are aware of this Civil Rights Impacts Analysis and that the alternatives and mitigations are considered. Any future travel management projects will be implemented only after an appropriate level of NEPA is completed and the decision documented. This project-level NEPA will be completed with adequate public involvement that will consider access and concerns from minorities, women, persons with disabilities, and low income populations. Continue to consult early and often with Oregon Tribal Governments regarding Special Areas of Historic Tribal Significance for implementation of travel management plans.

Continue to design travel management planning and public involvement opportunities that consider access concerns from minorities, women, persons with disabilities, and low income populations.

Determination that a CRIA is not needed

On May 16, 2008, the Deschutes and Ochoco National Forests embarked on a proposed action to improve management of motorized vehicle use on NFS lands within the Deschutes and Ochoco National Forests in accordance with regulations at 36 CFR Parts 121, 251, 261, and 295, and as described in Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule (2005).
The Notice of Intent (NOI) initiating the scoping process was published in the Federal Register on May 16, 2008.

A summary of the comments received during the scoping process, the issues raised, and how they were addressed related to this EIS are included in Chapter 1. A comprehensive description of the community collaboration used to help develop the proposed action is also available on our website (http://www.fs.fed.us/r6/centraloregon/travel-mgmt/index-projdocs-06-08.shtml) People have self-selected to participate in the public meetings, and to provide written comments and were not required to provide any information concerning individual demographic information.

Groups and classes of persons have been reviewed within the social analysis section of the EIS. No groups or classes or persons were found to be disproportionately negatively affected by this travel management decision. This travel management decision applies equally to all members of the public, and therefore is not discriminatory to any person or group.

Wildlife

Executive Summary

A biological evaluation (BE) was completed describing the effects to threatened, endangered and sensitive (TES) fauna species associated with the Travel Management Rule Project Area on the Deschutes and Ochoco National Forests.

A Joint Aquatic and Terrestrial Biological Assessment for Federal Lands within the Deschutes and John Day River Basin's Administered by the Deschutes and Ochoco National Forests was completed for 2006- 2009 projects. The BA established project design criteria to simplify and reduce consultation with U.S. Fish and Wildlife Service (USFWS) for 2006 and future projects. The goal for the forests is to fully implement the criteria to achieve conservation and recovery objectives of federally listed, proposed, and candidate species. Project

design criteria are to be used as sideboards and a filter for our planning process. Criteria focus on habitat alteration and disturbance effects. Applicable criteria are documented in the biological evaluation process used for individual project alternative analysis and effects determinations on threatened, endangered, proposed, and candidate species.

One threatened species, designated critical habitat, and 21 sensitive species, and/or their habitats are known or suspected to occur within the project area. The following is a summary of the findings of this biological assessment/evaluation of the effects of the proposed alternatives.

- The No Action Alternative is not expected to have any effects on spotted owls and their associated habitats.
- The Action Alternatives "**May Effect, and are likely to have a Beneficial Effect**" on the northern spotted owl and its habitats. Consultation is required for as this project type is not covered under the Project Design Criteria outlined in the FY2006-2009 Programmatic Biological Assessment.
- The Action Alternatives "**May Effect, and are likely to have a Beneficial Effect**" on designated critical habitat (for both the 1992 and 2008 designations) for the northern spotted owl. Consultation is required for as this project type is not covered under the Project Design Criteria outlined in the FY2006-2009 Programmatic Biological Assessment.
- The No Action Alternative is not expected to have any impacts on sensitive species and their habitats.
- Alternatives 2 & 3 would have a **"Beneficial Impact"** to the bald eagle, horned grebe, bufflehead, harlequin duck, American peregrine falcon, greater sage grouse, yellow rail, tri-colored blackbird, northern waterthrush, California wolverine, Pacific fisher, pygmy rabbit, Oregon spotted frog, Crater Lake tightcoil, silver-bordered fritillary, and Johnson's hairstreak and their habitats for the Deschutes National Forest.
- Alternatives 2 and 3 would have **"No Impact"** to the Lewis' woodpecker, white-headed woodpecker, and Townsend's big-eared bat and their habitats for the Deschutes National Forest.
- Alternatives 2 and 3 would have a **"Beneficial Impact"** to the bald eagle, peregrine falcon, Townsend's big-eared bat, and Johnson's hairstreak and their habitats for the Ochoco National Forest.
- Alternatives 2 and 3 would have **"No Impact"** to the bufflehead, western sage grouse, tri-colored blackbird, Lewis' woodpecker, white-headed woodpecker, upland sandpiper, pygmy rabbit, Columbia spotted frog, and silver-bordered fritillary and their habitats for the Ochoco National Forest.
- Alternatives 2 and 3 would be consistent with the Deschutes, Ochoco, and Crooked River National Grassland Land and Resource Management Plans for all sensitive species.

In addition, management indicator species and species of concern (species identified in the Landbird Conservation Strategies, Birds of Conservation Concern, and High Priority Shorebirds) were analyzed. The following is a summary of the findings of the wildlife report on the effects of the proposed alternatives.

- Alternatives 2 and 3 would result in decreased disturbance for 17 management indicator species (MIS) on the Deschutes and 3 MIS on the Ochoco while 4 MIS on the Deschutes and 5 MIS on the Ochoco remain unchanged.
- Alternatives 2 and 3 would be consistent with the Standards and Guidelines for the Deschutes, Ochoco, and Crooked River National Grassland Land and Resource Management Plans for Management Indicator Species. Habitat would not be removed or altered and disturbance would be decreased for many species.
- Alternatives 2 and 3 would result in decreased disturbance for 28 landbird species on the Deschutes and 15 landbird species on the Ochoco while 9 landbird species on the Deschutes and 21 landbird species on the Ochoco remain unchanged.
- Alternatives 2 and 3 is consistent with the biological objectives outlined in the Conservation Strategies for Landbirds of the East-slope Cascades, Columbia Plateau, and Northern Rocky Mountains. Habitat would not be removed or altered and disturbance is decreased for many species.
-

Affected Environment

Central Oregon is a destination location and the Deschutes and Ochoco National Forests and Crooked River National Grassland provide for many differing recreational opportunities ranging from historic uses such as hunting to more recent uses like hiking, kayaking, hang gliding, and off-highway vehicle use. Use of the forests has been steadily increasing. From 1990-2007, population growth from the tri-county area (Jefferson, Deschutes, and Crook counties) increased by 33%. It is assumed these counties would continue to grow resulting in a further increase in the use of the national forests and associated roads.

The main effects of roads on wildlife include wildlife mortality, direct and indirect loss of habitat, and reduced connectivity. The factors influencing the vulnerability of wildlife include species behavior and ecology. For example species who are attracted to openings or edge habitats that roads provide are more likely to end up as road kill than those species who avoid openings for interior forests.

Table 3-101 Characteristics making a species vulnerable to major effects of roads (Forman et al. 2003.)

Characteristics making a Species Vulnerable to Road Effects	Main Effects of Roads		
	Road Mortality	Habitat Loss	Reduced Connectivity
Attraction to Road Habitat	X		
High Intrinsic Mobility	X		
Habitat Generalist	X		
Multiple Resource Needs	X		X
Low Density/Large Area Requirement	X	X	X
Low Reproductive Rate	X	X	X
Forest Interior Species		X	X
Behavioral Avoidance of Roads		X	X

Not all species respond negatively to roads. Some species show positive responses to roads and road corridors may provide additional habitat for some species. New microclimates are often created along roads. Animals are attracted to transportation corridors for many reasons. These are generally related to habitat, facility of movement, and food resources. Habitat enhancements are often included during construction that may benefit some species. Roads do provide some benefits but these must be balanced against negative effects of roads.

The following tables display threatened, endangered, and sensitive (TES) species and Management Indicator Species (MIS) for the Ochoco and Deschutes National Forests as well as landbird species required for analysis.

Table 3-102. Threatened and Endangered Species Summary

Species	Habitat	Deschutes or Ochoco
Northern Spotted Owl	Old Growth Mixed Conifer Forests	Deschutes

Table 3-103 Sensitive Species Summary for the Deschutes and Ochoco National Forests and Crooked River National Grassland.

Species	Habitat	Deschutes or Ochoco
BIRDS		
Northern Bald Eagle (*Haliaeetus leucocephalus*)	Lakeside with Large Trees	Both
Bufflehead (*Bucephala albeola*)	Lakes, Snags	Both
Harlequin Duck (*Histrionicus histrionicus*)	Rapid Streams, Large Trees	Deschutes
Horned Grebe (*Podiceps auritus*)	Lake	Deschutes
Tricolored Blackbird (*Agelaius*	Lakeside, Bullrush	Both

Species	Habitat	Deschutes or Ochoco
tricolor)		
Yellow Rail (*Coturnicops noveboracensis*)	Marsh	Deschutes
Western Sage Grouse (*Centrocercus urophasianus phaeios*)	Sagebrush Flats	Both
American Peregrine Falcon (*Falco peregrinus anatum*)	Riparian, Cliffs	Both
Lewis' Woodpecker (*Melanerpes lewis*)	Large, open ponderosa pine and burned forests	Both
White-headed Woodpecker (*Picoides albolarvatus*)	Large, open ponderosa pine	Both
Northern Waterthrush (*Seiurus noveboracensis*)	Riparian vegetation including willows and alder	Deschutes
Upland Sandpiper (*Bartramia longicauda*)	Upland fields	Ochoco
MAMMALS		
Pacific Fisher (*Martes pennanti*)	Mixed, Complex	Deschutes
Pygmy Rabbit (*Brachylagus idahoensis*)	Sagebrush Flats	Both
California Wolverine (*Gulo gulo*)	Mix, High Elevation	Both
Townsend's Big-eared Bat (*Corynorhinus townsendii*)	Caves	Both
AMPHIBIANS		
Oregon Spotted Frog (*Rana pretiosa*)	Stream, Marsh	Deschutes
Columbia Spotted Frog (*Rana luteiventris)*	Stream, Marsh	Ochoco
INVERTEBRATES		
Crater Lake Tightcoil (*Pristiloma arcticum crateris*)	Riparian, Perennially Wet	Both
Silver-bordered Fritillary (*Boloria selene atrocostalis*)	Open riparian bogs and marshes	Both
Johnson's Hairstreak (*Mitoura johnsonii*) (*Callophrys johnsonii*)	Coniferous forests with mistletoe	Both

Table 3-104. Management Indicator Species Summary for the Deschutes and Ochoco National Forests and Crooked River Grassland.

Species	Habitat	Deschutes or Ochoco
Northern Goshawk (*Accipiter gentiles*)	Mature and old-growth forests; especially high canopy closure and large trees	Deschutes
Coopers Hawk (*Accipiter cooperi*)	Similar to goshawk, can also use mature forests with high canopy closure/tree density	Deschutes
Sharp-shinned Hawk (*Accipiter striatus*)	Similar to goshawk in addition to young, dense, even-aged stands	Deschutes
Great Gray Owl (*Strix nebulosa*)	Mature and old growth forests associated with openings and meadows	Deschutes
Great Blue Heron (*Ardea herodias*)	Riparian edge habitats including lakes, streams, marshes and estuaries	Deschutes
Golden Eagle (*Aquila chrysaetos*)	Large open areas with cliffs and rock outcrops	Deschutes
Waterfowl*	Lakes, ponds, streams	Deschutes
Red-tailed Hawk (*Buteo jamaicensis*)	Large snags, open country interspersed with forests	Deschutes

Osprey (*Pandion haliaetus*)	Large snags associated with fish bearing water bodies	Deschutes
Neotropical Migrants* see Landbirds	Various habitats	
Bats*	Forested areas, riparian	Deschutes
Northern Flicker (*Colaptes auratus*)	Open woodlands	Ochoco
Pileated Woodpecker (*Dryocopus pileatus*)	Dense, mature forests with large snags and logs	Ochoco
American Marten (*Martes americana*)	Mixed Conifer or High Elevation late successional forests with abundant down woody material	Deschutes
Elk (*Cervus elephas*)	Mixed habitats	Deschutes
Mule Deer (*Odocoileus hemionus*)	Mixed habitats	Deschutes
Snags and Down Wood Associated Species and Habitat* or Primary Cavity Excavators	Snags and down woody material	Deschutes and Ochoco

* - See Appendix 1 for a list of species.

Table 3-105 Landbird Species for the Deschutes and Ochoco National Forests and Crooked River Grassland.

Species	Habitat	Landbird Plan
White-headed woodpecker	Ponderosa Pine - Large patches of old forest with large snags	East-Slope Cascade Rocky Mountains BCR 9 BCR 10
Pygmy nuthatch	Ponderosa Pine - Large trees	East-Slope Cascade Rocky Mountains
Chipping sparrow	Ponderosa Pine - Open understory with regenerating pines	East-Slope Cascade Rocky Mountains
Lewis' woodpecker	Ponderosa Pine - Patches of burned old forest; Woodland - Large snags (cottonwood)	East-Slope Cascade Columbia Basin Rocky Mountains BCR 9 BCR 10
Brown creeper	Mixed Conifer - Large trees	East-Slope Cascade
Williamson's sapsucker	Mixed Conifer - Large snags	East-Slope Cascade BCR 9 BCR 10
Flammulated owl	Mixed Conifer - Interspersion grassy openings and dense thickets	East-Slope Cascade BCR 9 BCR 10
Hermit thrush	Mixed Conifer - Multi-layered/dense canopy	East-Slope Cascade
Olive-sided flycatcher	Mixed Conifer - Edges and openings created by wildfire	East-Slope Cascade Rocky Mountains BCR 10
Black-backed woodpecker	Lodgepole Pine - Old growth	East-Slope Cascade
Clark's nutcracker	Whitebark Pine - Old growth	East-Slope Cascade
Sandhill Crane	Meadows - Wet/dry	East-Slope Cascade
Red-naped sapsucker	Aspen - Large trees with regeneration	East-Slope Cascade Columbia Basin Rocky Mountains
Blue Grouse	Subalpine fir - Patchy presence	East-Slope Cascade

Species	Habitat	Landbird Plan
Grasshopper Sparrow	Steppe - Native bunchgrass cover	Columbia Basin
Loggerhead Shrike	Shrub Steppe - Interspersion of tall shrubs and openings	Columbia Basin BCR 9 BCR 10
Burrowing Owl	Shrub Steppe - Burrows	Columbia Basin
Sage Grouse	Sagebrush - Large areas of sagebrush with diverse understory of native grasses and forbs	Columbia Basin
Sage Sparrow	Sagebrush - Large unfragmented patches	Columbia Basin BCR 9 BCR 10
Brewer's Sparrow	Sagebrush – Sagebrush cover	Columbia Basin BCR 9 BCR 10
Sage Thrasher	Sagebrush – Sagebrush height	Columbia Basin BCR 9 BCR 10
Lark Sparrow	Shrublands – Ecotonal edges of herb, shrub, and tree habitats	Columbia Basin
Ferrunginous Hawk	Juniper Steppe – Scattered mature juniper trees (savannah)	Columbia Basin BCR 9 BCR 10
Bullock's Oriole	Woodland – Large canopy trees	Columbia Basin
Yellow Warbler	Woodland – Subcanopy foliage	Columbia Basin
Yellow-breasted Chat	Woodland – Dense shrub layer	Columbia Basin
Willow Flycatcher	Shrub – Shrub density; Riparian Shrub – Willow/alder shrub patches	Columbia Basin Rocky Mountains BCR 10
Lazuli Bunting	Shrub – Shrub-herbaceous interspersion	Columbia Basin
Gray Flycatcher	Juniper Woodland – Mature juniper with regeneration	Columbia Basin
Prairie Falcon	Cliff and Rimrock – Undeveloped foraging areas	Columbia Basin
Vaux's Swift	Mesic Mixed Conifer – Large snags	Rocky Mountains
Townsend's Warbler	Mesic Mixed Conifer – Overstory canopy closure	Rocky Mountains
Varied Thrush	Mesic Mixed Conifer – Structurally diverse; multi-layered	Rocky Mountains
MacGillivray's Warbler	Mesic Mixed Conifer – Dense shrub layer in forest openings or understory	Rocky Mountains
Red-eyed Vireo	Riparian Woodland – Canopy foliage and structure	Rocky Mountains
Veery	Riparian Woodland – Understory foliage and structure	Rocky Mountains
Hermit Thrush	Subalpine Forest	Rocky Mountains
Upland Sandpiper	Montane Meadows	Rocky Mountains
Vesper Sparrow	Steppe Shrublands	Rocky Mountains
Eared Grebe	Open water intermixed with emergent vegetation	BCR 9
Long-billed Curlew	Meadow/Marsh	BCR 9 BCR 10
Calliope Hummingbird	Open mountain meadows, open forests, meadow edges, and riparian areas	BCR 9 BCR 10
Green-tailed Towhee	Open ponderosa pine with dense brush	BCR 9
Pinyon Jay	Juniper, juniper-ponderosa pine transition, and ponderosa pine edges	BCR 9
Swainson's Hawk	Open lands with scattered trees	BCR 10

Species	Habitat	Landbird Plan
Cassin's Finch	Open coniferous forests from subalpine to juniper woodlands	BCR 10

General effects will be discussed in this section. General effects will cover broad categories of species and those effects common to all alternatives. Species specific effects are discussed in the Biological Evaluation and Wildlife Report. Species specific effects are broken into sections by status such as federally listed species, sensitive species, management indicator species (MIS), and Species of Concern. Federally listed species include federally listed Threatened, Endangered or Candidate species. Sensitive species include the Region 6 Regional Forester's Sensitive Species List of 2008. Management Indicator Species are those listed within each forest's respective Land and Resource Management Plan (LRMP). Species of Concern include species identified in the Landbird Conservation Strategies, Birds of Conservation Concern, and High Priority Shorebirds. When a species is in more than one category, the discussion will be found in the more sensitive category. For example the white-headed woodpecker is a sensitive species, MIS, and Species of Concern. The analysis for the white-headed woodpecker would be found in the Sensitive Species Section of this analysis.

Issue Statement

The proposed action would reduce the potential for vegetative wildlife habitat loss and disturbance from motorized vehicles as a result of changing where motorized access off designated routes is allowed and by modifying the conditions under which motorized access within 300' of an open road would continue. Motorized access off designated routes has the potential to fragment, damage, or eliminate habitats or to disturb the use of some habitats due to noise or frequency of visits. Motorized use off designated routes is likely to have similar effects to motorized use on designated routes, except that use on designated routes is more likely to be concentrated and at higher speeds, while motorized use off designated routes is likely to be more dispersed and at somewhat slower speeds. The proposed action would reduce the amount of area open to motorized access off designated routes and reduce the amount of disturbance to wildlife species and habitat.

Measures:

- Acres of specific wildlife habitat:
  - Disturbed
  - Undisturbed

Environmental Effects

Wildlife Mortality – Direct and Indirect Effects

Road associated collisions occur between two moving objects – animals and vehicles – with animals usually losing, resulting in injury or death. Collisions between animals and vehicles are commonly reported and affect a wide range of species, from large mammals to amphibians (Gaines et al. 2003). Most research regarding wildlife mortality related to roads centers around paved roads with high speed limits. However, little research is available regarding unpaved roads with slower speed limits. For the most part systematic records of wildlife road kill mortality are non-existent and therefore, it is unknown what significance this may play on wildlife populations.

The factors affecting road mortality of wildlife can be separated into two categories: 1) traffic, road, and landscape influences, and 2) species behavior and ecology.

Traffic, road and landscape influences
Collisions are influenced by vehicle speed and traffic volume. Studies have shown greater impacts with increasing speeds (Forman et al. 2003: 219, 783, 147, 440, 466; Mazerolle 2004).

Most Forest Service roads are not paved and are designed for low speed limits. There is a low probability of wildlife mortality caused by vehicles on these roads except for those smaller, less mobile species (amphibians, reptiles, and some small mammals). The probability of vehicle caused mortality increases on Forest Service arterial roads as these are paved roads designed for increased speed limits (≥50 mph).

Wildlife mortality relates to direct mortality from collisions primarily from high speed roads. There are 290 miles of Forest Service paved roads occurring within the Deschutes and Ochoco National Forests and the Crooked River National Grassland. The probability of vehicle caused mortality increases with 90-150 cars/day traveling 25-50 mile per hour (mph). Approximately 377 miles of double lane roads occur where the average speed is ≥40 mph. The probability of mortality increases with increased speed limits and increased traffic volume.

The greatest probability of vehicle caused mortality occurs on the State highways that pass through National Forest lands. A survey conducted by the Oregon Department of Fish and Wildlife in cooperation with the Oregon Department of Transportation has documented approximately 770 known mule deer mortalities along a 100 mile stretch of Highway 97 from October 2005 to July 2008. However, this may only be a proportion of the known mortalities. Forman et al. (2003) suggest the number of unreported deer mortalities can range from 50% to 6 times the reported number. Other studies have estimated up to 15 times the reported number. This ODFW study is using a factor of 5 times the reported number which accounts for pregnant does hit in the spring and represents 2 to 3 deer killed (S.Wray pers. comm.).

Species behavior and ecology
Some species are more vulnerable to being killed than others. Species that occur in low densities and have low reproductive rates are more susceptible to additional mortality (i.e. large carnivores) (Forman et al. 2003: 519, 1051, 325). In addition, higher mobility species appear to be more vulnerable to road mortality. Traffic volume has been found to have greater effects on highly mobile population densities than compared to little effect on less mobile species (Forman et al. 2003: 143, 144).

Habitat generalists, like deer and elk, are also more vulnerable to road mortality. This may be explained by the tendency of habitat generalists to venture more readily into unfamiliar habitats like roads, than a habitat specialist. For example, species that avoid open habitats (i.e. roads) are less vulnerable to road mortality.

Natural and seasonal movement patterns may lead to road mortality especially during specific seasons like spring and fall migrations of deer between summer range and winter range. Conrad and Gipson (2006) found that animal behavior and abundance was more influential in determining the frequency of wildlife-vehicle collisions than seasonal changes in traffic volumes, especially in areas with lower traffic volumes. In another example, more long-tailed weasels were killed on highways and roads in eastern Washington during the summer breeding season when mobility was increased (Forman et al. 2003).

Amphibians/Reptiles
Amphibian and reptile road caused mortalities are probably underrepresented in mortality counts due to their size and that scavengers may remove traces of them quickly (Forman et al. 2003; Mazerolle 2004). Frogs, toads, and snakes are susceptible to road kill, especially during seasonal migrations (Forman et al. 2003: 522, 412, 30; Mazerolle 2004; Montana TWS 1999). The probability of amphibians being killed on a busy highway has been found to be between 89-98% (Forman et al. 2003: 412).

Carnivores
Road kill impacts are more serious when species are threatened or endangered or of great conservation concern. Wide-ranging carnivores are particularly vulnerable to traffic accidents. Road kill mortality as a result of

collisions has been found to be a large factor in Florida panthers, ocelots, cougars in California, Iberian lynx, and wolves in Minnesota (Forman et al. 2003: 585, 414, 61, 284, 340). ODOT has very few records of carnivores killed on Highway 97 in Deschutes and Klamath counties. According to dispatch records from 1999 through 2006, only 3 bears were reported out of 40 records. The majority of mortalities included coyotes along with a few badgers. Caution should be used however as this data is not focused on road kill data collection specifically.

Conclusion
There are currently no plans to reduce or increase the number of paved roads on either the Deschutes or Ochoco National Forests. Mortality on the paved roads and highways is likely to increase as traffic volume increases. On-going studies for highway expansions and improvements should include travel ways for wildlife that could mitigate the effect of increased traffic. Habitats away from roads that provide for healthy populations will be important to offset road mortalities.

Habitat Loss – Direct and Indirect Effects

Habitat loss relates to direct loss of habitat from the roads and road prisms. This loss of habitat has occurred throughout various habitat types and affects to species varies. See Table 3-106 for the acres of direct habitat lost on the forests. This does not reflect non-system, user created roads that may exist on the landscape.

Table 3-106. Acres of direct habitat lost as a result from roads and road prisms.

	Deschutes National Forest	Ochoco National Forest	Total
Total Forest Acres	1,613,040	723,905	2,336,945 acres
Miles of Open Road	6,132 miles	1,886 miles	8,018 miles
Acres of Open Road	11,151 acres	3,296 acres	14,447 acres
Miles of Closed Road	2,050 miles	1,358 miles	3,408 miles
Acres of Closed Road	3,482 acres	3,833 acres	7,315 acres
Total Miles of Road	8,182 miles	3,244 miles	11,426 miles
Total Acres of Habitat Lost	**14,633 acres**	**7,129 acres**	**21,762 acres**

Road Construction
Road construction results in the direct loss of habitat and could result in indirect habitat loss of surrounding habitat. Some species are more vulnerable to habitat loss than others. Large, long-lived species with large area requirements, low densities, and low reproductive rates (i.e. carnivores) are a prime example (Forman et al. 2003: 342, 325). Interior dependent species are vulnerable to declining patch size which results in an increased edge effect (Forman et al. 2003: 66). Roads being long and linear create a lot of edge habitat that results in an additional loss of suitable habitat for those interior dependent species (Forman et al. 2003: 752, 760). Species mobility also affects how vulnerable they are to habitat loss. Some studies suggest more mobile species are able to cope better to habitat loss (Forman et al. 2003: 387). However, when factoring in a high rate of mortality of individuals in “non-habitat”, highly mobile species are actually more vulnerable to habitat loss than less mobile species (Forman et al. 2003: 302, 82, 349).

Conclusion
Road construction rates on the Deschutes and Ochoco National Forests and Grassland are low. Most projects occurring now utilize existing roads or employ the use of temporary spurs which are obliterated after projects are complete. Therefore, further habitat loss from the construction of new roads will be minimal in the future.

Habitat Quality – Direct and Indirect Effects

Road Disturbance

Roads alter the quality of habitat adjacent to them primarily as a result of noise from traffic disturbance. The road effect zone, depending on species could extend up to hundreds of meters from the road. Within this zone many species exhibit lower breeding densities and reduced species richness. Considering the road density plus the total area of avoidance zones, the ecological impact of road avoidance exceeds the impact of road kills or direct habitat loss from road corridors (Forman and Alexander 1998). This is known as the "road-effect zone" (Forman 2000). Forman (2000) also describes the "road effect distance" which is the distance that a significant effect extends from a road. The distances for which effects are seen in wildlife species vary. However, Forman (2000) cited a road effect zone for secondary roads of 200 meters, indicating this is a rough estimate for a highly variable zone. It should be noted however that secondary roads were defined as having a traffic volume of 10,000 vehicles/day or less which is far greater than occurs on our forest roads. Forman calculated that approximately 19% of the total area of the United States is directly affected ecologically by roads and associated vehicle traffic and he noted roads in rural areas show a greater ecological effect than those occurring in more urban areas. The road effect distance can equate to reduced habitat quality for some species and habitat loss for others.

Noise

Noise is a major factor in wildlife displacement and avoidance of habitat. Noise can be defined as any "human-made sound that alters the behavior of animals or interferes with their normal functioning" (Bowles in Knight and Gutzwiller 1995). Effects of noise on most wildlife species is poorly understood (AMEC 2005). The potential effects of noise on wildlife include (AMEC 2005, Forman and Alexander 1998):

- Acute or chronic physiological damage to the auditory system (hearing loss)
- Increased energy expenditure
- Physical injury incurred during panicked responses
- Interference with normal activities, such as feeding and breeding
- Impaired communication among individuals and groups
- Increase in stress hormones
- Altered behaviors

The impacts of these effects may include habitat loss through avoidance, reduced reproductive success, and mortality (AMEC 2005).

Decreased Sensitivity to Sound

An animal's sensitivity to sound varies with the frequency band to which it is most sensitive to (AMEC 2005). Sound is usually measured in decibels (dB) and can vary with distance from the source due to a variety of factors like topography, weather, features that act as barriers (trees), volume, and the source (AMEC 2005). Noise emitted from many OHVs today can reach as high as 90 dBs (V. Ramming, pers. comm.). Although sounds from OHVs are not the loudest sounds, they are emitted more frequently in wildlife habitats than other high intensity sounds (Brattstrom and Bondello 1983 in Ouren et al. 2007) and effects on animals can be significant. For example, sand lizards and kangaroo rats exposed to playback recordings of dune buggies at lower decibels than they would have been actually exposed to experienced hearing loss for weeks after and were unresponsive to predator sounds (Brattstrom and Bondello 1983 in Ouren et al. 2007).

Communication Confusion

Human made noise has the potential of interfering with animal communication signals, sounds animals listen to for orientation, and for predator-prey detection (Erbe et al. 1999 in AMEC 2005). For example, Reynolds et al. (1992) has shown that human disturbance near northern goshawk nests is a suspected cause of nest abandonment. Noisy environments can cause problems with intra-species communication (i.e. breeding season), and can interfere with detection, discrimination, and localization of appropriate signals (Wollerman 1998 in AMEC 2005). This could have severe effects to populations whose numbers are already low (AMEC 2005). Vehicle noise may indirectly cause mortality by eliminating a species' ability to detect and capture necessary food items and detect and avoid predators (Montana TWS 1999). In addition, ambient (background) noise affects the distance at which

vocalizations, human-made noises, and other sounds can be detected (AMEC 2005). Ambient noise in terrestrial environments includes sounds like animal calls and songs (e.g. birds, frogs, and insects), water, and wind (AMEC 2005). At times, OHV noise may simulate natural sounds (e.g. thunder) to which animals are adapted and result in negative effects. In a study conducted by Brattstrom and Bondello (1983 in Ouren et al. 2007), spadefoot toads subjected to taped motorcycle sounds emerged prematurely from their burrows during the wrong season (absence of rain).

Physiological effects

Noise may lead to physiological effects (functions and activities of life) and shifts in the use of available habitat (Barton and Holmes 2007; Fletcher et al. 1999, Eigenbrod et al. 2007; Forman et al. 2003; and Gaines et al. 2003). Road corridors resulting in reduced habitat quality express effects by either a decrease in abundance or density of breeding individuals or by behavioral responses like road avoidance (Forman et al. 2003; McGregor et al. 2008, Barton and Holmes 2007; Fletcher et al. 1999, and Eigenbrod et al. 2007).

Stress

Responses to noise disturbance may have physiological impacts on wildlife. Animals exhibit increases in stress hormones from disturbance related to roads. Studies have shown that species closer to roads or living in areas of high road densities have increased stress hormones (spotted owls Wasser et al. 1997) and reduced reproductive success (mule deer, Yarmoloy 1988 in Ouren et al. 2007).

Impacts of short-term effects of noise disturbance on individuals and populations are unknown. For some species, brief interruptions in normal behavior may result in little effect on reproductive success or energy expenditure. Noises resulting in one-time acute responses are less likely to have population level effects than are those sounds that animals are exposed to repeatedly to over extended periods of time (OSB 2003 in AMEC 2005). In contrast, Forman and Alexander (1998) state that responses to roads with little traffic (individual vehicles periodically passing) may elicit behavioral responses similar to those exhibited during acute disturbances rather than the effects of chronic disturbance along roads.

Habitat Loss

Habitat loss is a potential impact of noise disturbance on wildlife. Studies on ungulates and carnivores have shown heavily traveled roads are avoided or used little in comparison to lightly traveled roads (Forman et al. 2003: 797, 615, 913, 579, 350, 302, Rowland et al. 2005). Large mammals tend to have lower population densities within 100-200 meters of roads and other animals seem to avoid roads (i.e. arthropods, small mammals, birds) (Forman and Alexander 1998, Barton and Holmes 2007, Eigenbrod et al. 2007, Fletcher et al. 1999, Montana TWS 1999, Gaines et al. 2003, and Ouren et al. 2007). Mountain goats were found to run away from the road edge when truck gears were being shifted over 0.6 miles away (Lyren 2001 in Ouren et al. 2007).

Breeding birds are heavily affected by traffic disturbance (i.e. noise) and studies have shown reduced densities near highways and trails (Forman et al. 2003: 699, 660, 767, 768, 294; Barton and Holmes 2007, Montana TWS 1999). Birds are reported to show the most dramatic negative responses to road noise proportionate to the level of traffic (Kaseloo 2006). In one study, 7 of 12 grassland bird species had reduced breeding densities near roads (van der Zande et al. 1980, Reijnen et al. 1995) and in a Boston study, breeding density of at least two grassland bird species declined with increasing traffic volume (Kaseloo 2006). In addition, 26 of 43 woodland bird species showed declines in population density with increasing traffic volumes (Reijnen and Foppen 1995 in Kaseloo 2006). Van der Zande et al. (1980) found four shorebird species in open grassland areas were disturbed within 500-600 meters of a quiet rural road and within 1600-1800 meters of a busy highway. This resulted in populations being decreased as much as 60% over these distances. Reijnen et al. (1995) reported the road effect distance in open habitats may extend to more than 1000 meters and up to several hundred meters in woodlands (Reijnen and Thissen 1987) in those areas with high traffic volumes. In addition, Miller et al. (1998 in Montana TWS 1999) identified the zone of influence for songbirds as 75-100 meters. Barton and Holmes (2007) found daily abandonment rates of songbird nests was four times higher at nests <100 meters from motorized trails than those >100 meters away.

Hutto (1995) reported that brown creepers and golden-crowned kinglets were twice as likely to occur in habitats >100 meters from a road while Foppen and Reijnen (1994) found roads and motorized trails influenced bird reproduction to a distance of 200 meters. Gaines et al. (2003) also used 200 meters on either side of roads as an index to evaluate the effects of displacement and avoidance for species that use late-successional habitats (e.g. northern goshawk, northern spotted owl, brown creeper, pygmy and white-breasted nuthatches, and white-headed woodpecker). Rodgers and Smith (1995) found great blue herons reacted to humans afoot more than traffic and flushed at a mean distance of 32.0 $\pm$ 12.3 meters. They recommended a 100 meter setback to limit disturbance near nesting colonies. The 250 meter zone of influence for waterfowl species used by Gaines et al. (2003) was based on distances at which waterfowl and colonial nesters have been observed to be affected by human disturbance (Hamann et al. 1999, Kelly 1992, Markham and Brechtel 1979, Rodgers and Smith 1995, and Vos et al. 1985). Dubois and Hazelwood (1987 in Montana TWS 1999) recommended buffer distances of 0.4 – 1.2 km around nests during the nesting season for raptors. Holmes et al. (1993 in Montana TWS 1999) recommended a 14-190 meter buffer to avoid flushing golden eagles from perches while foraging.

Access for predators

Mortality can also increase in habitats near roads for some species. There is increased human contact with animals resulting in intentional or accidental killing. Roads provide greater access for both humans and predators to habitats previously not accessed (Forman et al. 2003: 579, 115, 451,742). Roads and trails used during the winter by snowmobiles often results in snow compaction and may provide access routes for competitors and predators to areas used by species like lynx (Gaines et al. 2003). Roads and trails may facilitate access for falconers to remove young raptors from nests (Erdman et al. 1998 in Gaines et al. 2003) and result in increased poaching of animals, particularly big game (Cole et al. 1997, ODFW pers. comm.). Roads and trails are used by trappers and increase the vulnerability of species like fisher and marten to overharvest (Gaines et al. 2003). And habituation may occur if the stimulus occurs repeatedly with benefits (e.g. access to food) and without negative effects.

Conclusion

A 200 meter buffer was applied to all open system roads on the Deschutes and Ochoco National Forests regardless of road surface, travel speed or use parameters. This is to display the road effect distance where effects to wildlife species are the greatest. See Table 3-107 for the total forest acres, acres included in the road effect distance, and the percentage of each forest affected by the road effect distance.

Table 3-107. Total Acres Included in the Road Effect Distance (200m) for the Deschutes and Ochoco National Forests.

Forest	Total Forest Acres	Acres within Road Effect Distance	Percent of Each Forest in Road Effect Distance
Deschutes	1,613,040	713,532	44%
Ochoco	723,905	245,834	34%

Over one third of Forest Service lands on the Deschutes and Ochoco National Forests lay within this effect distance, resulting in disruption of life functions and activities to various degrees for many species.

In addition to State highways and county owned roads running through the two forests, there are approximately 527 miles of road on the Deschutes and 607 miles of road on the Ochoco that have a traffic volume of $\geq$ 20 cars/day which may result in increased habitat avoidance due to noise, increased stress levels, and increased habitat loss due to avoidance.

Improved Habitat Quality – Indirect Effects

Not all species respond negatively to roads. Some species show positive responses to roads and road corridors may provide additional habitat for some species. For example, at times red-winged blackbirds are more abundant near roads (Forman et al. 2003: 162). In some cases, rodents appear to be either unaffected or positively influenced by roads. New microclimates are often created along roads. Ditches serving as wetlands provide habitat for amphibians, bridges provide habitat for bats, and plants seem to prefer certain substrates (Forman et al. 2003). Animals are attracted to transportation corridors for many reasons. These are generally related to habitat, facility of movement, and food resources. Habitat enhancements are often included during construction that may benefit some species. For example, perches are often constructed providing additional perching habitat for raptors and fencing may increase forage and cover for small mammals (Forman et al. 2003: 8). Increased nitrogen levels are associated with heavily traveled roads (Forman et al. 2003: 23). This has a positive effect for insects and grasshoppers (Forman et al. 2003: 737) and produces high quality forage for herbivores. Increased populations of small mammals can lead to increased predators like coyotes and hawks. Collisions may increase where animals are foraging adjacent to roads and road kill provides additional food resources for scavengers. Human feeding attracts some species like coyotes, bears, and ravens. This feeding may be intentional or as result of food thrown out or garbage occurring along the road. This may lead to habituation of some animals which may lead to other effects. Roads do provide some benefits but these must be balanced against negative effects of roads.

Connectivity and Barriers – Indirect Effects

Landscape connectivity relates to the amount of fragmentation and/or disruption of movement from road associated barriers.

Landscape connectivity is the degree to which the landscape facilitates animal movement and other ecological flows (Forman et al. 2003: 494, 905, 302, 400, 73). High landscape connectivity is a landscape that has few barriers and where animals move freely. High landscape connectivity is important because multi-habitat organisms move through the landscape to different habitat types in order to meet daily and life needs (Forman et al. 2003: 232). Barriers that impede movement (i.e. roads) result in higher mortality, lower reproductive success, and smaller populations. High landscape connectivity also allows for movements to re-populate areas that have experienced local declines or extinctions and minimizes inbreeding (Forman et al. 2003: 1035, 520, 73). Barriers to movement result in habitats that are devoid of populations or contain smaller populations than could be supported. This leads to an increased probability of species loss.

Little is known about the long lasting effects of roads on animal populations in terms of reduced mobility, increased isolation, and/or splitting of gene pools. Isolation caused by physical barriers (i.e. roads) to movement can reduce gene flow leading to genetic effects (Forman et al. 2003: 31, 1009). Reducing gene flow between populations results in negative effects of inbreeding or inbreeding depression which often results in weak or sterile offspring. Riley et al. (2006) conducted a study to determine at what level are busy freeways resulting in physical and social barriers to gene flow in two highly mobile carnivores (coyote and bobcat). They found that high survival rates, small home ranges, high home range overlap, and barrier effects of the freeway resulted in territory packing along hard boundaries (freeway). This produced social and behavioral barriers to dispersers in that dispersers were unlikely to obtain and hold territories near the freeway. Therefore, roads reduced the gene flow below the expected migration rates.

Permeability

Individual behavior and habitat requirements often influence when animals cross roads. Traffic volume may be a key factor in determining corridor permeability (susceptibility of being crossed) of all roads, especially for large mammals (Forman et al. 2003). For some animals, high traffic volumes pose barriers while others may shift behavior and cross during low traffic volumes. Crossings are also influenced by adjacent habitat quality (Forman et al. 2003: 350, 107). Some studies show secondary and unpaved roads have little effect on movement of large mammals and are more permeable than paved roads (Forman et al. 2003: 115, 78, 107, 350). However, Rowland et al. (2005) reported elk avoid areas near open roads with bulls exhibiting a stronger avoidance than cows (Marcum and Edge 1991 in Rowland et al. 2005). This may be similar for small mammals and amphibians. Road

width affects movements of some small mammals. McGregor et al. (2008) found small mammals avoid the road surface rather than traffic noise. Most individuals translocated across the road did not return but densities did not decrease near the road and the road instead acted as a barrier to movement and funneled movement along the road edge. Roads have been shown to alter or preclude amphibian seasonal movements to breeding ponds (Gibbs 1998, Vos and Chardon 1998 in Ouren et al. 2007). Jaeger et al. (2005 in McGregor et al. 2007) surmised the type of avoidance (road itself or traffic) is critical to predict effects of roads on population persistence. If roads create barriers to movement, this could reduce the likelihood or speed of recolonization of empty forest patches.

Another factor influencing the barrier effect is the relative permeability of the road and the adjacent edge habitat. Edge effects can be realized in a variety of impacts including habitat fragmentation, barriers to movement, altered predator/prey relationships, removal of critical habitat components, increased mortality, allowing competitors and predators into areas not previously accessed, and impacts from noise disturbance. Edge effects from roads and trails extend well beyond the actual road footprint (Reed et al.1996).

Movement may depend upon the abruptness of the edge and the species habitat needs (Forman et al. 2003). Demaynadier and Hunter (1998 in Montana TWS 1999) found salamanders, frogs, and toads were all negatively affected by forest edges but found salamanders were much more sensitive to abrupt forest edges than frogs or toads. Barrier effects of roads affects species differently depending on the animal's behavior, dispersal ability, and population density (Forman et al. 2003). A species dispersal ability – the distance it can move and its ability to move through matrix habitat – affects patch occupancy patterns (Montana TWS 1999). Semlitsch (1998 in Montana TWS 1999) found six species of Ambystoma salamanders varied in their dispersal and use of habitat surrounding ponds. Some of the species dispersed and used terrestrial habitat up to 250 meters from the pond edge. In addition, Hart et al. (1998 in Montana TWS 1999) found northern alligator lizards were positively affected by forest edges and had increased dispersal rates near road edges.

Fragmentation

Roads contribute to forest fragmentation by dissecting large patches into smaller patches. This results in decreased interior forest habitat and increased edge habitat (Askins et al. 1987, Small and Hunter 1988, Schonewald-Cox and Buechner 1992, and Askins 1994, in Montana TWS 1999, Reed et al. 1996). Habitat fragmentation from corridors (roads) reduces a species capacity by disrupting continuous forest cover and reducing space required by interior species. Patch size and distribution can determine the probability that a patch may be occupied (Laan and Verboom 1990, Fahrig 1998 in Montana TWS 1999). The degree of patch isolation is negatively associated with patch occupancy (Sjogren 1991, Vos and Stumpel 1995, and Branch et al. 1996 in Montana TWS 1999). For example, ditches meant to drain forest areas between frog ponds isolated them even though the distance between was not altered (Sjogren-Gulve and Ray 1996 in Montana TWS 1999). Rich et al. (1994 in Montana TWS 1999) found roads measuring 16 meters wide had an affect on songbirds. Hutto (1996) found that some songbirds may occur less commonly in smaller forest patches than in larger forest patches. Hickman (1990 in Montana TWS 1999) found similar results as Hutto but on trails 2-3 meters wide.

Riparian areas are usually areas of high diversity. Fragmentation of riparian habitats by roads may create greater impacts on the landscape. Patch size is reduced and roads may separate important habitat associations between the uplands and riparian areas. Connected riparian and upland habitats were more effective in meeting habitat needs for a large variety of songbirds (Hutto 1995).

Road edges may serve as ecological traps (Andrews 1990 in Ouren et al. 2007). These areas may have the necessary resources for species occupation but impose high mortality rates. For example, some bird species are attracted to roadsides due to the lush vegetation for nesting and foraging (Clark and Karr 1979 in Ouren et al. 2007). Although the area contains suitable habitat, these individuals are at great risk of mortality of being hit by vehicles (Mumme et al. 2000 in Ouren et al. 2007). In addition, avian nests can experience increased mortality due to high predation rates (Yahner et al. 1979 in Ouren et al. 2007).

Roads may act as barriers for some species but may aid in the dispersal of other native and non-native species. For example, the construction of the United States interstate highway system created avenues for dispersal by grassland species due to the adjacent dense grass habitat (Forman et al. 2003: 347). Roads can also promote the increased distribution of wildlife populations unlikely to be common in an area which may exert additional competitive pressure on native species (Ouren et al. 2007). Rich et al. (1994 in Ouren et al. 2007) found corridors attracted brown-headed cowbirds and nest predators to the corridors and the adjacent forest interior. Predation rates may also increase in small patches as these are easier for predators to penetrate. Adjacent roads provide travel corridors into forested habitat from nearby areas (Small and Hunter 1988, Askins 1994 in Montana TWS 1999).

Roads can affect predator prey associations. Wolves are less abundant in areas with high road densities (Forman et al. 2003: 908, 456, 618, 644). However, in areas with little human use, roads provide easy travel routes and access to prey (Forman et al. 2003: 913, 415). The presence of infrastructure along roads can also alter predator prey relationships. Knight and Kawashima (1993 in Ouren et al. 2007) found ravens increased their distribution throughout the Mojave Desert. They perched on utility structures along roads to scan for carcasses. Berry et al. (1986 in Ouren et al. 2007) reported ravens being responsible for 68-75% of the mortality among juvenile desert tortoises on two plots.

Conclusion

Currently, Highway 97 is creating a barrier to movement for many wildlife species, especially big game. As human use continues to increase across the two forests, the other state highways (20, 26, 58, and 126) and highly traveled arterials (Metolius Basin area, Cascade Lakes Highway, Sunriver area, McKay Creek, and Big Summit Prairie) are likely to become barriers as well. Impacts to local mule deer herds have been documented as declines in the population have been seen due to the difficulty in crossing Highway 97. As human use increases, it is likely wildlife species have shifted their behavior to cross highly used arterials during low traffic volume periods or are crossing at other locations resulting in the avoidance of suitable habitat patches.

Fragmentation is moderate to high across the Deschutes and Ochoco National Forests. Roads have resulted in smaller patch sizes with few large patches remaining (i.e. Newberry Monument, Oregon Cascades Recreation Area, Mt. Bachelor, roadless areas, Lookout Mountain Management Area, Rock/Cottonwood, and wilderness areas). This has resulted in increased edge habitat with 44% of the Deschutes and 34% of the Ochoco within the road effect distance.

Comparison of Alternatives

The following section displays the comparison of alternatives for TES, MIS, and Landbird species. In most cases, potentially suitable habitat acres were analyzed for each species. In some cases, habitat allocations were used.

Northern Spotted Owl

Nesting, Roosting, and Foraging Habitat

Implementation of the Action Alternatives would greatly reduce disturbance to nesting, roosting, and foraging (NRF) habitat overall for the spotted owl. As can be seen from Table 3-108, there would be a 58% decrease in disturbance to NRF habitat across the forest. In addition, there would be a 30% decrease in disturbance to NRF habitat in the 2008 Critical Habitat Units (CHU) and a 4% decrease in the historic (1992) Critical Habitat Units. NRF habitat within Late-Successional Reserves (LSR) shows a 7% decrease in disturbance to habitat while home ranges show a 3% decrease. Overall, there would be a beneficial effect to suitable NRF habitat across the forest.

Table 3-108 NRF habitat comparison for Alternatives 2 and 3 (Deschutes NF).

NRF Habitat	Alt. 1 – No Action Undisturbed NRF Acres	Alts. 2 & 3 – Action Alternatives Undisturbed NRF Acres
NRF	5%	63%
NRF – CHU	20%	50%
NRF – Historic CHU	46%	50%
NRF – LSR	45%	52%
NRF-Home Ranges	55%	58%

Late-Successional Reserves

Implementation of the Action Alternatives would reduce disturbance within Late-Successional Reserves. As can be seen from Table 3-109, there would be a 14% decrease in disturbance to habitat within LSRs across the forest overall. In addition, implementation of the action alternatives resulted in 4 LSR's with decreased disturbance to habitat overall (Brown's Mountain, Davis, Metolius, and Three Creeks) (Table 3-109). Implementation of the action alternatives resulted in two LSR's with decreased disturbance to NRF habitat (Brown's Mountain and Metolius) while the remaining LSRs remained constant as many of the LSR's were already closed to travel off designated routes.

Table 3-109 LSR and NRF habitat within LSRs comparison for Alternatives 2 and 3 (Deschutes NF).

Late-Successional Reserve	Alt. 1 – No Action Undisturbed Acres	Alts. 2 & 3 – Action Alternatives Undisturbed Acres	Alt. 1 – No Action Undisturbed NRF Acres	Alts. 2 & 3 – Action Alternatives Undisturbed NRF Acres
Cultus	58%	58%	48%	48%
Sheridan	42%	42%	57%	57%
Brown's Mtn.	2%	61%	9%	71%
Round Mtn	87%	87%	92%	92%
Davis	13%	58%	50%	50%
Crescent	33%	33%	22%	22%
Upper Big Marsh	97%	97%	97%	97%
Lower Big Marsh	85%	85%	0	0
Metolius	41%	46%	39%	50%
Cache-Trout	38%	38%	47%	47%
Three Creeks	33%	78%	99%	99%

Critical Habitat Units

Implementation of the Action Alternatives would result in an overall decrease in disturbance to habitat in both the historic and 2008 Critical Habitat Units. There would be a 2% decrease in disturbance to habitat in the historic Critical Habitat Units. Specifically, only one historic CHU (OR-3) resulted in decreased disturbance to habitat while the remaining historic CHU's and 2008 CHU remained constant. Disturbance decreased in NRF habitat within the 2008 CHU and two historic CHU's (OR-3 and OR-6) while the remaining historic CHU's remained constant.

Table 3-110 Historic and 2008 Critical Habitat Unit and NRF habitat in CHUs comparison for Alternatives 2 and 3 (Deschutes NF).

Critical Habitat Unit	Alt. 1 – No Action Undisturbed Acres	Alts. 2 & 3 – Action Alternatives Undisturbed Acres	Alt. 1 – No Action Undisturbed NRF Acres	Alts. 2 & 3 – Action Alternatives Undisturbed NRF Acres
2008 CHU	48%	48%	20%	50%
OR-3	40%	49%	36%	53%
OR-4	45%	45%	46%	46%
OR-5	46%	46%	54%	54%
OR-6	54%	54%	46%	47%
OR-7	55%	55%	49%	49%

Home Ranges

Implementation of the Action Alternatives would result in a decrease in disturbance to habitat overall. There would be a 2% decrease in disturbance to habitat in spotted owl home ranges as a whole. Disturbance would be decreased in three home ranges (Saddle Butte, Moore Creek Trail, and Castle Rocks) while disturbance would be decreased to NRF habitat in three home ranges (Big Marsh, Moore Creek Trail, and Suttle).

Table 3-111. Home range and NRF habitat within home ranges comparison for Alternatives 2 and 3 (Deschutes NF).

Home Range	Alt. 1 – No Action Undisturbed Acres	Alts. 2 & 3 – Action Alternatives Undisturbed Acres	Alt. 1 – No Action Undisturbed NRF Acres	Alts. 2 & 3 – Action Alternatives Undisturbed NRF Acres
Cultus Mountain	72%	72%	78%	78%
Applejack	72%	72%	78%	78%
Benchmark	12%	12%	23%	23%
Deer Lake	75%	75%	46%	46%
Sheridan Mountain	56%	56%	79%	79%
Lucky Lake	86%	86%	100%	100%
Three Trappers Butte	17%	17%	27%	27%
McCool Butte	55%	55%	47%	47%
Hamner Butte	41%	41%	39%	39%
Ringo Butte	55%	55%	51%	51%
Maklaks Mountain	58%	58%	43%	43%
Moore Creek	58%	58%	50%	50%
Crescent Lake	90%	90%	100%	100%
Saddle Butte	32%	35%	29%	29%
Big Marsh	93%	93%	78%	97%
Royce Mountain	63%	63%	65%	65%
Moore Creek Trail	36%	78%	37%	43%
Cappy Mountain	98%	98%	97%	97%
Willamette Pass	66%	66%	47%	47%
Trapper Creek	89%	89%	64%	64%
Castle Rocks	67%	78%	67%	67%
Candle Creek	100%	100%	100%	100%
Jefferson Lakes	95%	95%	73%	73%
Trout Creek	41%	41%	43%	43%

Home Range	Alt. 1 – No Action Undisturbed Acres	Alts. 2 & 3 – Action Alternatives Undisturbed Acres	Alt. 1 – No Action Undisturbed NRF Acres	Alts. 2 & 3 – Action Alternatives Undisturbed NRF Acres
Davis Creek	48%	48%	69%	69%
Bluegrass Butte	27%	27%	37%	37%
Suttle	25%	25%	35%	38%
Suttle 96	36%	36%	30%	30%
Suttle South	23%	23%	2%	2%
Obsidian	48%	48%	43%	43%
Black Crater	73%	73%	86%	86%

Determination
Alternatives 2 and 3 would reduce disturbance to NRF habitat overall, as well as to NRF habitat within LSRs and home ranges. In addition, disturbance would be reduced within LSRs and home ranges overall outside NRF habitat. Alternatives 2 and 3 would have a **"May Effect, and likely a Beneficial Affect"** to spotted owls and their habitat.

Critical Habitat Units
Alternatives 2 and 3 would reduce disturbance to NRF habitat within Critical Habitat Units overall, both in the 2008 Critical Habitat Units and in the 1992 Critical Habitat Units. In addition, disturbance would be reduced within CHUs outside NRF habitat. Alternatives 2 and 3 would have a "**May Effect, and likely a Beneficial Affect"** to the 2008 and 1992 Critical Habitat Units.

Big Game
Alternatives 2 and 3 would greatly reduce disturbance in MA-7. As shown in Tables 3-112 and 3-113, there would be a 38% decrease in disturbance throughout this area. In addition, 8 of the 11 KEHAs on the Deschutes National Forest showed a potential decrease in disturbance while the remaining three remained constant. Overall, there would be an 18% decrease in disturbance for the total KEHA acres across the forest. General Forest Winter Range is the only allocation to show a decrease in disturbance on the Ochoco National Forest, going from 13% to 78% of the area now undisturbed. Winter Range, Metolius Deer Winter Range, and Antelope Winter Range all remained constant. This is due to those areas of the forest already being closed to motorized access off designated routes prior to the implementation of Alternatives 2 or 3. Alternatives 2 and 3 are consistent with the Standards and Guidelines for the Deschutes, Ochoco, and Crooked River National Grassland Land and Resource Management Plans for big game. Motorized traffic would be limited to designated routes, road densities would remain unchanged, habitat would not be removed or altered and disturbance would be decreased.

Table 3-112. Deschutes NF - MA-7

Big Game Allocation	Alternative 1 – No Action Undisturbed Habitat Deschutes	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Deschutes
MA-7 – Deschutes NF	12%	50%

Table 3-113. Deschutes NF – Key Elk Habitat Areas

Key Elk Habitat Area	Alternative 1 – No Action Undisturbed Habitat Deschutes	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Deschutes
Clover Meadow	84%	89%
Crane Prairie	49%	49%
Davis	46%	56%

Key Elk Habitat Area	Alternative 1 – No Action Undisturbed Habitat Deschutes	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Deschutes
Fall River	46%	56%
Fly	20%	39%
Hemlock	57%	65%
Kiwa Butte	87%	87%
Lower Metolius	59%	59%
Maklaks	57%	84%
Ryan Ranch	8%	47%
Tumalo Mtn.	100%	100%

Table 3-114.Ochoco NF – Winter Range

Big Game Winter Range Area	Alternative 1 – No Action Undisturbed Habitat Ochoco	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Ochoco
Metolius Deer Winter Range	65%	65%
General Forest Winter Range	13%	78%
Winter Range	80%	80%
Antelope Winter Range	52%	52%

Sensitive Species, MIS, and Landbirds

Overall, there would be a decrease in disturbance to wildlife species across both forests. Alternatives 2 and 3 would result in decreased disturbance to 61 species on the Deschutes NF and 31 species on the Ochoco NF while 16 species on the Deschutes and 41 species on the Ochoco remain constant.

Alternatives 2 and 3 would result in decreased disturbance for 16 sensitive species on the Deschutes and 4 sensitive species on the Ochoco while 3 sensitive species on the Deschutes and 10 sensitive species on the Ochoco remain unchanged. Alternatives 2 and 3 would have a **"Beneficial Impact"** to the bald eagle, horned grebe, bufflehead, harlequin duck, peregrine falcon, western sage grouse, yellow rail, tri-colored blackbird, northern waterthrush, California wolverine, Pacific fisher, pygmy rabbit, Oregon spotted frog, Crater Lake tightcoil, silver-bordered fritillary, and Johnson's hairstreak and their habitats for the Deschutes National Forest. Alternatives 2 and 3 would have **"No Impact"** to the Lewis' woodpecker, white-headed woodpecker, and Townsend's big-eared bat and their habitats on the Deschutes National Forest. Alternatives 2 and 3 would have a **"Beneficial Impact"** to the bald eagle, peregrine falcon, Townsend's big-eared bat, and Johnson's hairstreak and their habitats for the Ochoco National Forest. Alternatives 2 and 3 would have **"No Impact"** to the bufflehead, western sage grouse, tri-colored blackbird, Lewis' woodpecker, white-headed woodpecker, upland sandpiper, pygmy rabbit, Columbia spotted frog, and silver-bordered fritillary and their habitats for the Ochoco National Forest.

Table 3-115. Summary of Conclusion of Impacts, Region 6 Sensitive Species, Alternatives 2 and 3 for the Deschutes and Ochoco National Forests and Crooked River National Grassland.

Species	Alternative 1 – No Action		Alternatives 2 & 3	
	Deschutes NF	Ochoco NF	Deschutes NF	Ochoco NF
Northern Bald Eagle	**NI**	**NI**	**BI**	**BI**
Horned Grebe	**NI**	**-**	**BI**	**-**
Bufflehead	**NI**	**NI**	**BI**	**NI**
Harlequin Duck	**NI**	**-**	**BI**	**-**
American Peregrine Falcon	**NI**	**NI**	**BI**	**BI**
Western Sage Grouse	**NI**	**NI**	**BI**	**NI**

Species	Alternative 1 – No Action		Alternatives 2 & 3	
	Deschutes NF	Ochoco NF	Deschutes NF	Ochoco NF
Yellow Rail	**NI**	-	**BI**	**-**
Tri-colored Blackbird	**NI**	**NI**	**BI**	**NI**
Lewis' Woodpecker	**NI**	**NI**	**NI**	**NI**
White-headed Woodpecker	**NI**	**NI**	**NI**	**NI**
Northern Waterthrush	**NI**	-	**BI**	**-**
Upland Sandpiper		**NI**	**-**	**NI**
California Wolverine	**NI**	-	**BI**	**-**
Pacific Fisher	**NI**	-	**BI**	**-**
Pygmy Rabbit	**NI**	**NI**	**BI**	**NI**
Townsend's Big-eared Bat	**NI**	**NI**	**NI**	**BI**
Oregon Spotted Frog	**NI**	**-**	**BI**	**-**
Columbia Spotted Frog	**-**	**NI**	**-**	**NI**
Crater Lake Tightcoil	**NI**	**NI**	**BI**	**NI**
Silver-bordered Fritillary	**NI**	**NI**	**BI**	**NI**
Johnson's Hairstreak	**NI**	**NI**	**BI**	**BI**

NI = No Impact
MIIH = May impact individuals or habitat, but will not likely contribute a trend toward federal listing or loss of viability to the population or species
BI = Beneficial Impact

Alternatives 2 and 3 would result in decreased disturbance for 17 management indicator species (MIS) on the Deschutes and 3 MIS on the Ochoco while 4 MIS on the Deschutes and 5 MIS on the Ochoco remain unchanged. Alternatives 2 and 3 would be consistent with the Standards and Guidelines for the Deschutes, Ochoco, and Crooked River National Grassland Land and Resource Management Plans for Management Indicator Species. Habitat would not be removed or altered and disturbance would be decreased for many species.

Alternatives 2 and 3 would result in decreased disturbance for 28 landbird species on the Deschutes and 15 landbird species on the Ochoco while 9 landbird species on the Deschutes and 21 landbird species on the Ochoco remain unchanged. Alternatives 2 and 3 would be consistent with the biological objectives outlined in the Conservation Strategies for Landbirds of the East-slope Cascades, Columbia Plateau, and Northern Rocky Mountains. Habitat would not be removed or altered and disturbance is decreased for many species.

Table 3-116. Comparison of Alternatives.

Species	Alternative 1 – No Action Undisturbed Habitat Deschutes	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Deschutes	Alternative 1 – No Action Undisturbed Habitat Ochoco	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Ochoco
SENSITIVE SPECIES				
Northern Bald Eagle	6,749 (26%)	13,796 (53%)	1,992 (38%)	4,312 (82%)
Bufflehead	11,367 (26%)	28,615 (65%)	28,032 (55%)	28,032 (55%)
Harlequin Duck	955 (4%)	11,556 (44%)	NA	NA
Horned Grebe	11,895 (14%)	50,813 (59%)	NA	NA
Tricolored Blackbird	6,731	29,297	9,980	9,980

Species	Alternative 1 – No Action Undisturbed Habitat Deschutes	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Deschutes	Alternative 1 – No Action Undisturbed Habitat Ochoco	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Ochoco
SENSITIVE SPECIES				
	(14%)	(61%)	(54%)	(54%)
Yellow Rail	3,967 (9%)	25,638 (61%)	NA	NA
Western Sage Grouse	5,889 (58%)	6,560 (65%)	44,434 (71%)	44,432 (71%)
American Peregrine Falcon	11,743 (93%)	12,022 (95%)	1,110 (74%)	1,595 (80%)
Lewis' Woodpecker	2,716 (38%)	2,716 (38%)	2,826 (63%)	2,826 (63%)
White-headed Woodpecker	12,773 (35%)	12,773 (35%)	5,541 (67%)	5,541 (67%)
Northern Waterthrush	6,408 (13%)	21,746 (45%)	NA	NA
Upland Sandpiper	NA	NA	5,888 (53%)	5,888 (53%)
Pacific Fisher	3,038 (73%)	3,481 (83%)	NA	NA
Pygmy Rabbit	5,889 (58%)	6,560 (65%)	44,434 (71%)	44,432 (71%)
California Wolverine	86,473 (93%)	89,763 (97%)	NA	NA
Townsend's Big-eared Bat	13,145 (45%)	13,145 (45%)	1,110 (56%)	1,594 (80%)
Oregon Spotted Frog	15,414 (17%)	43,898 (49%)	NA	NA
Columbia Spotted Frog	NA	NA	32,626 (54%)	32,626 (54%)
Crater Lake Tightcoil	12,570 (17%)	39,510 (54%)	44,652 (58%)	44,652 (58%)
Silver-bordered Fritillary	4,147 (10%)	25,818 (61%)	9,414 (56%)	9,414 (56%)
Johnson's Hairstreak	7,632 (4%)	87,330 (44%)	15,190 (21%)	56,324 (76%)
MANAGEMENT INDICATOR SPECIES				
Northern Goshawk	92, 596 (33%)	108,296 (39%)	14,607 (20%)	17,578 (24%)
Coopers Hawk	170,753 (61%)	170,696 (61%)	14,148 (21%)	52,472 (76%)
Sharp-shinned Hawk	63,623 (19%)	188,227 (55%)	7,194 (6%)	88,840 (69%)
Great Gray Owl	7,632 (4%)	87,330 (44%)	15,190 (21%)	56,324 (76%)
Great Blue Heron	18,492 (20%)	57,897 (61%)	43,124 (55%)	43,124 (55%)
Golden Eagle	7,518 (14%)	27,864 (52%)	36,175 (43%)	49,666 (59%)
Waterfowl	18,492 (20%)	57,897 (61%)	43,124 (55%)	43,124 (55%)
Red-tailed Hawk	2,716	2,716	2,826	2,826

Species	Alternative 1 – No Action Undisturbed Habitat Deschutes	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Deschutes	Alternative 1 – No Action Undisturbed Habitat Ochoco	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Ochoco
SENSITIVE SPECIES				
	(38%)	(38%)	(63%)	(63%)
Osprey	6,127 (15%)	22,850 (55%)	20,384 (53%)	20,384 (53%)
Pileated Woodpecker	57,885 (64%)	71,880 (80%)	229 (49%)	408 (87%)
Northern Flicker	10,170 (41%)	10,149 (41%)	7,673 (66%)	7,672 (66%)
American Marten	56,793 (74%)	64,554 (85%)	7,286 (32%)	18,309 (81%)
Long-eared Myotis	6,574 (22%)	15,488 (51%)	2,118 (39%)	4,450 (82%)
Long-legged Myotis	5,760 (90%)	6,118 (96%)	108 (80%)	116 (86%)
Silver-haired Bat	212 (10%)	992 (48%)	0	3 (60%)
Williamson's sapsucker	14,757 (37%)	14,754 (37%)	5,239 (66%)	5,239 (66%)
Hairy Woodpecker	14,027 (6%)	123,374 (51%)	112,942 (63%)	112,936 (63%)
Black-backed woodpecker	4,333 (1%)	302,226 (52%)	6,881 (3%)	140,322 (68%)
Three-toed Woodpecker	21,014 (4%)	315,510 (53%)	2,123 (1%)	131,770 (67%)
Red-naped sapsucker	3,045 (45%)	3,949 (59%)	1,076 (37%)	1,078 (37%)
Downy Woodpecker	3,045 (45%)	3,949 (59%)	1,076 (37%)	1,078 (37%)
LANDBIRDS				
Pygmy nuthatch	589 (0%)	84,065 (42%)	12,734 (21%)	46,922 (76%)
Chipping sparrow	79,960 (42%)	79,824 (42%)	110,166 (61%)	110,159 (61%)
Brown creeper	92,497 (30%)	185,645 (60%)	14,623 (21%)	54,176 (76%)
Flammulated owl	37,741 (38%)	37,735 (38%)	6,293 (14%)	32,395 (73%)
Olive-sided flycatcher	14,027 (6%)	123,374 (51%)	112,942 (63%)	112,936 (63%)
Clark's nutcracker	86,473 (93%)	89,763 (97%)	NA	NA
Sandhill Crane	10,564 (21%)	32,726 (65%)	15,302 (55%)	15,302 (55%)
Blue Grouse	33,968 (36%)	52,866 (57%)	5,863 (70%)	6,177 (73%)
Loggerhead Shrike	720 (69%)	720 (69%)	44,121 (46%)	56,878 (60%)
Burrowing Owl	720 (69%)	720 (69%)	44,121 (46%)	56,878 (60%)
Sage Sparrow	5,889	6,560	44,434	44,432

Species	Alternative 1 – No Action Undisturbed Habitat Deschutes	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Deschutes	Alternative 1 – No Action Undisturbed Habitat Ochoco	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Ochoco
SENSITIVE SPECIES				
	(58%)	(65%)	(71%)	(71%)
Brewer's Sparrow	5,889 (58%)	6,560 (65%)	44,434 (71%)	44,432 (71%)
Sage Thrasher	5,889 (58%)	6,560 (65%)	44,434 (71%)	44,432 (71%)
Lark Sparrow	5,889 (58%)	6,560 (65%)	892 (1%)	53,469 (72%)
Ferruginous Hawk	7,355 (14%)	26,697 (52%	939 (60%)	937 (60%)
Bullock's Oriole	5,822 (10%)	26,126 (47%)	45,496 (57%)	45,496 (57%)
Yellow Warbler	5,822 (10%)	26,126 (47%)	45,496 (57%)	45,496 (57%)
Yellow-breasted Chat	51,239 (15%)	188,257 (55%)	136,935 (62%)	136,927 (62%)
Willow Flycatcher	8,640 (14%)	29,843 (48%)	45,496 (57%)	45,513 (57%)
Lazuli Bunting	8,640 (14%)	29,843 (48%)	45,496 (57%)	45,513 (57%)
Gray Flycatcher	185,290 (50%)	185,264 (50%)	42,120 (62%)	42,115 (62%)
Prairie Falcon	11,743 (93%)	12,022 (95%)	1,110 (74%)	1,595 (80%)
Vaux's Swift	57,885 (64%)	71,880 (80%)	229 (49%)	408 (87%)
Townsend's Warbler	92,497 (30%)	185,645 (60%)	14,623 (21%)	54,176 (76%)
Varied Thrush	90,885 (63%)	116,938 (81%)	13,649 (28%)	39,103 (79%)
MacGillivray's Warbler	51,239 (15%)	188,257 (55%)	136,935 (62%)	136,927 (62%)
Red-eyed Vireo	5,822 (10%)	26,126 (47%)	45,496 (57%)	45,496 (57%)
Veery	51,239 (15%)	188,257 (55%)	136,935 (62%)	136,927 (62%)
Hermit Thrush	90,885 (63%)	116,938 (81%)	13,649 (28%)	39,103 (79%)
Vesper Sparrow	720 (69%)	720 (69%)	44,121 (46%)	56,878 (60%)
Eared Grebe	6,973 (39%)	13,620 (75%)	233 (52%)	233 (52%)
Long-billed Curlew	3,248 (72%)	3,704 (82%)	1,997 (8%)	14,925 (63%)
Calliope Hummingbird	10,564 (21%)	32,726 (65%)	15,302 (55%)	15,302 (55%)
Green-tailed Towhee	720 (69%)	720 (69%)	44,121 (46%)	56,878 (60%)
Pinyon Jay	185,290 (50%)	185,264 (50%)	42,120 (62%)	42,115 (62%)

Species	Alternative 1 – No Action Undisturbed Habitat Deschutes	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Deschutes	Alternative 1 – No Action Undisturbed Habitat Ochoco	Alternatives 2 and 3 – Action Alternatives Undisturbed Habitat Ochoco
SENSITIVE SPECIES				
Swainson's Hawk	7,355 (14%)	26,697 (52%	939 (60%)	937 (60%)
Cassin's Finch	10,170 (41%)	10,149 (41%)	7,673 (66%)	7,672 (66%)

Native Vegetation

Executive Summary

There are No Effects on Threatened or Endangered plant species or habitat from any of the actions proposed in this EIS because there are no federally listed Threatened or Endangered plant species or habitats documented or suspected on the Forests or Grassland. Therefore, activities proposed in the alternatives would have no effect on federally listed plant species. As noted in the analysis on invasive plants, motorized access – regardless of type of vehicle – contributes to the spread of invasive plants, which in turn can affect native plant populations.

Alternative 1 (No Action) provides the least protection to native plants and native plant habitats, including special habitats and sensitive and other rare or uncommon plants, because more (often the majority of) acres are open to motorized travel off of designated routes. Alternative 1 allows unrestricted motorized access for dispersed camping with no special provisions.

Alternatives 2 (Proposed Action) and 3 substantially reduce the amount of acres open for motorized travel off of designated routes. This would increase the protection for native plants and native plant habitats, including special habitats and sensitive and other rare or uncommon plants, over current conditions (Alternative 1). Alternatives 2 and 3 would have a beneficial impact on interior areas on the Forests and Grassland.

Within areas open for motorized access for dispersed camping, Alternatives 2 and 3 restrict access to within 300' of the centerline of roads. Sensitive areas have been identified and, in these areas, motorized access for dispersed camping is confined to existing, designated, or defined sites (i.e., special provisions). Some upland areas in Alternative 2 are open for motorized access for dispersed camping anywhere within the 300' area (no special provisions). Alternative 3 provides the highest level of protection for native plant habitats because all motorized access for dispersed camping would be confined to existing, designated, or defined sites. This would reduce damage to native vegetation adjacent to dispersed campsites.

In both Alternatives 2 and 3, motorized access for dispersed camping cannot occur within 30' of water bodies (e.g., streams, creeks, rivers, wetlands, lakes). This would have a beneficial effect on riparian vegetation.

Affected Environment

The Deschutes and Ochoco National Forests and Crooked River National Grassland contain a wide variety of plant species and communities due to varying elevation and precipitation zones that occur within Central Oregon. The project area ranges from high elevation alpine habitats in the Cascade Mountains that receive 120 inches of annual precipitation to desert habitats that receive about 8-10 inches of annual precipitation.

Native Plants and Native Plant Habitats

Plant communities can be classified by a variety of factors such as vegetation structure, site moisture, and overstory and understory plant species composition. Similar plant associations are aggregated and grouped by their climax species, site potential, and moisture similarities into Plant Association Groups (PAGs). Grouping plant associations helps us predict, compare and analyze potential disturbance patterns and how the vegetation will respond to these disturbances. PAGs are used in this analysis to evaluate the effects of the alternatives on native plants and native plant habitats.

Vegetation on the Forests and Grassland varies with elevation and moisture gradients from west to east. For example, on the Deschutes National Forest, elevation, precipitation, and distance from the crest of the Cascade Mountains greatly influence vegetation patterns. At 10,000 feet elevation, the alpine peak of South Sister receives 145 inches of precipitation. Heading east from the Cascade crest, the amount of precipitation rapidly decreases, to 12 inches in the town of Bend.

Deschutes National Forest

Vegetation on the Deschutes National Forest includes high elevation, high precipitation sites where whitebark pine, subalpine fir, and mountain hemlock occur. These areas are very cold with abundant snowpack and plants are adapted to a short growing season. At mid-elevations, mixed conifer plant communities occur where greater precipitation and soil moisture allow for a wide variety of coniferous trees. Depending on site conditions, trees may be Douglas-fir, white fir, incense cedar, lodgepole pine, ponderosa pine, western larch, western white pine, sugar pine, Pacific silver fir and Shasta red fir. At the foot slopes of the Cascade Mountains and further east, conditions are relatively warm and dry and more moisture-limited. Drought-adapted species – ponderosa pine and juniper – occur in this zone.

Table 3-117 lists the 23 plant association groups (PAGs) currently mapped on the Deschutes National Forest, and provides the acres and percentage of the total for each group. Many of the plant associations grouped to form PAGs are those described in Volland (1985). Since this mapping occurred, a new plant association guide has been completed (Simpson 2007); however, the newly revised plant associations are not yet mapped and available on GIS.

Table 3-117. Total acres of mapped Plant Association Groups (PAGs) and their relative percentages that occur on the Deschutes National Forest.
See Appendix B-4.2.14 for a description of each PAG.

PAG	Deschutes Acres	Deschutes % of Total
Alpine Dry	506	0.03
Alpine Meadow	3,732	0.2
Alpine shrub	184	0.01
Cinder	6,972	0.4
Glacier	937	0.05
Hardwood	494	0.03
Juniper Woodlands	2,911	0.1
Lava	27,514	1.4
Lodgepole Pine Dry	496,991	25
Lodgepole Pine Wet	70,352	3.6
Meadow	7,678	0.4
Mesic Shrub	10,430	0.5
Mixed Conifer Dry	304,180	16
Mixed Conifer Wet	94,565	5
Mountain Hemlock Dry	191,496	10
Ponderosa Pine Dry	574,852	29

PAG	Deschutes Acres	Deschutes % of Total
Ponderosa Pine Wet	75,787	4
Riparian	8,890	0.5
Rock	12,886	1
Water	35,695	2
White Bark Pine Dry	145	0.01
Xeric Shrublands	28,227	1

Ochoco National Forest and Crooked River National Grassland

Table 3-118 lists the 9 PAGs found on the Ochoco NF and Grassland, and provides the number of acres and percentage of each. A general description of each PAG is presented below (Table 30X(6)); information is taken from Simpson et al. (1994) or Simpson (2009, *personal communication*).

Table 3-118. Total acres of mapped Plant Association Groups (PAGs) and their relative percentages that occur on the Ochoco National Forest and Crooked River National Grassland.
See Appendix B-4.2.14 for a description of each PAG.

PAG	Ochoco/ CRNG Acres	Ochoco/ CRNG % of Total
Douglas Fir	118,963	11
Dry Grand Fir	217,487	21
Dry Ponderosa Pine	107,934	10
Juniper Steppe	44,530	4
Juniper Woodland	248,208	24
Mesic Ponderosa Pine	86,835	8
Moist Grand Fir	67,400	7
Nonforest	141,686	14
Subalpine Fir	3,859	0.4

Special Habitats on the Deschutes and Ochoco National Forests

Special habitats are areas which sustain unusual and/or particularly rich biological diversity. These habitats have a high probability of supporting rare species. All non-forest and riparian habitats are often treated as special habitats because they encompass such a small percentage of the land base in forested regions but have a disproportionate value in the conservation of biological diversity (USDA Forest Service 1996). For example, the riparian PAG on the Deschutes comprises only 1% of the total PAGs (Table 3-117), yet riparian habitats are abundantly used for recreation such as camping, fishing and hiking.

The texture and pattern of biodiversity can be examined at many different scales, ranging from global to microscopic. At the landscape scale, the coarse scale of Plant Association Group patterns miss unusual small scale habitats such as small non-forested habitats, or riparian seeps. At an even finer scale, certain structural features within habitats, such as hard snags or root wads, provide habitat for rare species of fungi, bryophytes, and lichens. The distribution of plant species may be determined by broad climatic patterns or by fine variation in the drainage of a miniature wetland (Dimling and McCain 1992).

This analysis focuses on the following special habitats: wetlands, riparian, meadows (wet, moist, and dry), hardwoods (aspen stands and cottonwood bottomlands), and scablands. These habitats are discussed below:

Hardwoods – This type includes quaking aspen (*Populus tremuloides*) stands and cottonwood (*Populus trichocarpa)* bottomlands. These deciduous hardwood trees provide a variety of important ecological functions, diversification of landscape patterns, and habitat for many other species (USDA Forest Service 1997). Riparian communities made up of these species are extremely diverse in plant life since they initiate forest succession, and thus provide great structural diversity. Hydrologically, these deciduous plant communities provide excellent stability to stream banks and soil surfaces. Their deep and spreading root systems can resist flood pressures and slow water velocity. They provide shade to help maintain stream temperatures, and abundant leaf shedding in the fall increases soil fertility.

Black cottonwood habitat, which occurs along stream courses up to approximately 4,500 feet in elevation, is a short-lived species (100 to 120 years on the average) (USDA Forest Service 1997). Stands develop following flood deposition and scour on floodplains in broad or open alluvial valleys. Regeneration may be by seed, stump sprouting, and rooted cutting. Aspen grows in self-perpetuating clones in areas of locally high moisture such as meadows, seeps, and streamsides.

Aspen and cottonwood are short-lived, early seral species that rely on disturbance for establishment. Black cottonwood has been declining due to conversion of floodplain vegetation to agricultural uses, changes in stream systems (confining streams into a single channel), over browsing by livestock, elk and deer, and conifer encroachment. (USDA Forest Service 1997). Quaking aspen is declining as the result of conifer encroachment and increasing density, over browsing by livestock, deer and elk, and loss of habitat where the water table as dropped due to stream downcutting.

Meadows (dry, moist and wet) – Meadow communities are found in areas where ground water is higher than that found on the surrounding upland sites, such as a spring. They can also include perched water table areas within stream communities. Meadow communities include moist meadows, where moisture is available in the rooting-zone during the growing season, but drops 1-3 feet in the fall, and wet meadows, where available water is at or near the surface all season long (Hall 1989). Dry meadows have no standing water and dry out completely in the summer (Simpson 2009, *personal communication*).

Riparian – Riparian areas are defined as a geographic area containing an aquatic ecosystem and the upland areas that directly affect it. Plant communities within these areas are influenced by stream morphology and disturbance regimes, and support a diversity of vegetation. The herbaceous vegetation within riparian areas is often dominated by shrubs, forbs, grasses, and sedges. There is usually a narrow band of moisture-loving plants directly adjacent to the stream, such as sedges and bulrushes.

Riparian habitats often incur a disproportionate amount of human activity (i.e., these habitats are often used more by people than upland habitats). Roads and trails passing through or parallel to riparian areas can affect the vegetation. Many roads are located along streams, resulting in direct loss of these habitats when built in riparian zones. Streams tend to be desirable places to camp and recreate, which can result in trampling of vegetation.

Scabland – These non-forested habitats have rocky, shallow soils and are commonly found on topographically high sites. Dominated by bunchgrasses and forbs, these sites are particularly exposed to summer heat and dryness, winter cold, and spring frost-heaving.

Wetlands – Wetlands have one or more of the following three attributes: 1) at least periodically the substrate is dominated by facultative or obligate hydrophytes (i.e., water-loving plants); 2) the substrate is predominantly hydric soil; and 3) the substrate is non-soil and is either saturated with or covered by shallow water at some time during the growing season (Kovalchik 1987). Wetlands include:

- Ponds – a body of standing water and its associated edge of water-tolerant vegetation. The pond may be permanent or seasonal.
- Bogs and fens – permanently wet areas dominated by sphagnum and other acid-tolerant plants.
- Swamps – permanently wet area, often shaded by the canopy.

Research Natural Areas

Research Natural Areas (RNAs) are part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity on National Forest System lands (Forest Service Manual 4063). RNAs are principally for non-manipulative research, observation, and study, and may also assist in implementing provisions for special acts, such as the Endangered Species Act of 1973 and the monitoring provisions of the National Forest Management Act of 1976 (Forest Service Manual 4063). RNAs are managed such that natural physical or biological processes are allowed to prevail without human intervention. According to FSM 4063.3 standards, management of an RNA must support and promote the basic objectives and purposes of establishing the area.

Overall objectives for RNAs are to maintain a wide spectrum of high quality representative areas of the major forms of variability found in forest, shrublands, grasslands, alpine, and natural situations, to preserve and maintain genetic diversity, and to protect against human-caused environmental disruptions. These areas serve as reference areas for the study of natural ecological processes including disturbance, and serve as baseline areas for measuring long-term ecological changes.

Each RNA contains representative or unique natural features in a relatively undisturbed condition. The designation of these areas provides long-term protection and recognition of their natural values for research and baseline ecological study, observation, and conservation of biological diversity. Table 3-119 lists the RNAs on the Forests and Grassland.

Table 3-119. Research Natural Areas on the Deschutes and Ochoco National Forests and Crooked River National Grassland.

RNA	Objectives/features for the RNA
Deschutes National Forest	
Cache Mountain	Lakes at mid-elevation in mixed conifer forest; white fir-Pacific silver fir/snowberry plant association
Headwaters of the Cultus	Large upwelling cold springs; lodgepole pine/mixed conifer/Engelmann spruce
Katsuk Butte	High elevation cinder cone. Mostly mountain hemlock forest.
Many Lakes	Bogs, subalpine permanent ponds and bogs. Lodgepole pine and mountain hemlock forests.
Metolius	Ponderosa pine/bitterbrush and ponderosa pine/Douglas fir/green manzanita forests.
Mokst Butte	Forested cinder cone with white fir forest, recent lava flow. Lava flow, mixed conifer forest.
Pringle Falls	Topographically related mosaic of lodgepole pine and ponderosa pine on Mt. Mazama pumice soils. Ponderosa pine-white fir/green manzanita and lodgepole pine/bitterbrush plant association. Fire in lodgepole pine zone.
Torrey-Charlton	Small lakes and ponds. Mountain hemlock forest.
Wechee Butte	Entirely forested cinder cone.
Ochoco National Forest	
Ochoco Divide	Ponderosa pine-Douglas fir and Grand fir-western larch-Douglas fir plant associations.
Crooked River National Grassland	
Haystack Butte	Western juniper/big sagebrush
The Island	Western juniper/big sagebrush/bluebunch wheatgrass and western juniper/big sage-bitterbrush community.

There would be no change to the management of RNAs, regardless of the chosen alternative. These areas are not open for motorized travel off of designated routes nor motorized access to dispersed camping. ***Therefore, there would be no effects to these areas and they are not analyzed further.***

Threatened, Endangered and Sensitive Plant Species

The Forest Service is directed to manage habitats for all existing native and desired non-native plants, fish, and wildlife species in order to maintain viable populations of such species. This direction comes from Forest Service Manual section 2600 (USDA Forest Service 1995, WO Amendment 2600-95-7) and stems from direction provided by the Endangered Species Act. Forest Service Manual (FSM) 2670.5 defines sensitive species as those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers, density, or habitat capability that would reduce a species existing distribution. In FSM 2670.22, management direction for sensitive species is, in part, to ensure that species do not become threatened or endangered because of Forest Service actions, and to maintain viable populations of all native species. A viable population consists of a number of individuals adequately distributed throughout their range necessary to perpetuate the existence of the species in natural, genetically stable, self-sustaining populations.

A biological evaluation is conducted to review Forest Service programs and activities for possible effects on sensitive plant species (USDA Forest Service 1995b). The biological evaluation process consists of a prefield review of available information to identify known or potentially occurring sensitive and rare and uncommon plant species, a field reconnaissance of the proposed project and an evaluation of potential effects to these species from the proposed project. If there would be potential adverse effects or conflicts, then the project is evaluated to see if it can be revised so that adverse effects do not occur.

There are no known occurrences of federally listed endangered or threatened plants within the Deschutes and Ochoco National Forests and Crooked River National Grassland. There is no habitat recognized as essential for listed or proposed plant species recovery under the Endangered Species Act. Because there are no Threatened or Endangered plant species on the Deschutes and Ochoco National Forests and Crooked River National Grassland, this assessment will refer only to “sensitive” species.

Table 3-120 summarizes the sensitive plant species that are either documented or suspected to occur on the Forests and Grassland**.** The Deschutes National Forest has a total of 58 species on its Sensitive Plant List: 36 vascular plants (16 are documented to occur), 14 bryophytes (5 are documented), and 5 fungi (4 are documented). The Ochoco National Forest and Crooked River National Grassland have 39 species on its Sensitive Plant List: 34 vascular plants (12 are documented), 3 bryophytes (1 is documented), 2 lichens (both are documented) and no fungi. Detailed information about the species is described in Appendix A of the Biological Evaluation (Appendix B-4.2.13). Some sensitive plant species have habitats on both Forests and Grassland. In total, there are 77 sensitive plants that are documented or suspected to occur on one or both of the Forests and Grassland (54 vascular plants, 15 bryophytes, 3 lichens, and 5 fungi).

Table 3-120. Sensitive plant species documented (D) or suspected (S) to occur on the Deschutes and Ochoco National Forests and Crooked River National Grassland.
For documented species, the total number of mapped sites and approximate acres are provided.

Scientific Name and Code	Common Name	DES	OCH & CRNG
Vascular Plants			
Achnatherum hendersonii	Henderson’s needlegrass		D (33 sites/217 ac.)

Scientific Name and Code	Common Name	DES	OCH & CRNG
Achnatherum wallowaensis	Wallowa needlegrass		D (5 sites/14 ac.)
Agoseris elata	tall agoseris	D (42 sites/985 ac.)	
Arabis suffrutescens var. *horizontalis*	horizontal woody rockcress	S	
Arnica viscosa	Mt. Shasta arnica	D (1 site/0.7 ac.)	
Astragalus diaphanus var. *diurnus*	transparent milkvetch		S
Astragalus peckii	Peck's mil-vetch	D (5 sites/50 ac.)	S
Astragalus tegetarioides	Deschutes milkvetch		D (1 site/11 ac.)
Botrychium ascendens	trianglelobe moonwort		D (3 sites/0.5 ac.)
Botrychium crenulatum	scalloped moonwort		D (22 sites/29 ac.)
Botrychium minganense	Mingan moonwort		D (10 sites/8.8 ac.)
Botrychium montanum	mountain moonwort		D (12 sites/3.8 ac.)
Botrychium paradoxum	peculiar moonwort		D (1 site/0.2 ac.)
Botrychium pumicola	pumice grape-fern	D (320 sites/3,325 ac.)	
Calamagrostis breweri	Brewer's reedgrass	S	
Calochortus longebarbatus var. *peckii*	Peck's mariposa lily		D (166 sites/2,963 ac.)
Camissonia pygmaea	dwarf suncap		S
Carex abrupta	abrupt-beaked sedge	S	S
Carex capitata	capitate sedge	D (1 site/0.1 ac.)	

Scientific Name and Code	Common Name	DES	OCH & CRNG
Carex diandra	lesser panicled sedge	S	S
Carex lasiocarpa var. *americana*	slender sedge	D 1 site/0.3 ac.)	S
Carex livida	livid sedge	S	
Carex retrorsa	retrorse sedge	S	S
Carex vernacula	native sedge	S	
Castilleja chlorotica	green-tinged paintbrush	D (152 sites/1,124 ac.	
Cheilanthes feei	Fee's lip-fern	S	S
Collomia mazama	Mt. Mazama collomia	S	
Cyperus acuminatus	short-pointed cyperus	D (2 sites/1 ac.)	
Cyperus lupulinus ssp. *lupulinus*	A cyperus	S	S
Elatine brachysperma	short-seeded waterwort	S	S
Eleocharis bolanderi	Bolander's spikerush		S
Eriogonum cusickii	Cusick's buckwheat		S
Eucephalus gormanii (formerly Aster gormanii)	Gorman's aster	S	
Gentiana newberryi var. *newberryi*	alpine gentian	D (13 sites/51 ac.)	
Heliotropium curassavicum	salt heliotrope	S	S
Lipocarpha aristulata	aristulate lipocarpha	S	S
Lobelia dortmanna	Dortmann's cardinalflower	D (1 site/2 ac.)	
Lomatium ochocense	Ochoco lomatium		D (1 site/0.6 ac.)
Lycopodiella inundata	inundated clubmoss	D (4 sites/7 ac.)	
Lycopodium complanatum	ground cedar	S	
Mimulus evanescens	disappearing monkeyflower		S
Muhlenbergia minutissima	annual dropseed	S	S
Ophioglossum pusillum	northern adderstongue	S	
Penstemon peckii	Peck's penstemon	D (87 sites/4,903 ac.)	D (3 sites/13 ac.)

Scientific Name and Code	Common Name	DES	OCH & CRNG
Pilularia americana	American pillwort	S	
Potamogeton diversifolius	Rafinesque's pondweed	S	S
Rorippa columbiae	Columbia yellowcress	D (1 site/0.1 ac.)	S
Rotala ramosior	lowland toothcup	S	S
Salix wolfii	wolf's willow		S
Scheuchzeria palustris ssp. *americana*	rannoch-rush	D (1 site/ 15 ac.)	
Schoenoplectus subterminalis (formerly *Scirpus subterminalis*)	swaying bulrush	D (1 site/ 0.1 ac.)	
Talinum spinescens	spinescent fameflower		S
Thelypodium eucosmum	world thelypody		S
Utricularia minor	lesser bladderwort	D (6 sites/0.4 ac.)	S
Bryophytes			
Barbilophozia lycopodioides	liverwort	S	
Brachydontium olympicum	moss	S	
Chiloscyphus gemmiparus	liverwort	S	
Conostomum tetragonum	moss	S	
Helodium blandowii	moss	D (2 sites/0.1 ac.)	D (1 site/0.2 ac.)
Polytrichium sphaerothecium	moss	S	
Pseudocalliergon trifarium	moss	S	
Rhizomnium nudum	rhizomnium moss	D (3 sites/ 0.2 ac.)	
Schistostega pennata	luminous moss	D (3 sites/20 ac.)	
Scouleria marginata	marginate splashzone moss	S	S
Splachnum ampullaceum	moss	S	
Tomentypnum nitens	moss	D (18 sites/14 ac.)	
Tortula mucronifolia	moss		S
Trematodon boasii	moss	S	

Scientific Name and Code	Common Name	DES	OCH & CRNG
Tritomaria exsectiformis	liverwort	D (11 sites/0.7 ac.)	
Lichens			
Dermatocarpon. luridum	silverskin lichen	D (3 sites/0.2 ac.)	D (7 sites/3 ac.)
Leptogium cyanescens	skin lichen	S	
Texosporium sancti-jacobi	lichen	S	D (2 sites/0.2 ac.)
Fungi			
Alpova alexsmithii	fungus	D (2 sites/ 0.1 ac.)	
Gastroboletus vividus	fungus	S	
Helvella crassitunicata	fungus	D (1 site/ 0.1 ac.)	
Hygrophorus caeruleus	fungus	D (3 sites/ 0.2 ac.)	
Ramaria amyloidea	fungus	D (1 site/ 0.1 ac.)	

Other Rare and Uncommon Plant Species

In addition to sensitive plant species, there are other rare or uncommon vascular plants, fungi, lichens and bryophytes that occur on the Deschutes National Forest (Table 3-121). The Forest has chosen to ensure populations for these rare or uncommon species are not jeopardized. These species are considered in this analysis.

Table 3-121. Other rare or uncommon plant species documented on the Deschutes National Forest.

Scientific Name	Lifeform	District (No. of Sites)
Chaenotheca subroscida	Lichen	Crescent (1)
Choiromyces alveolatus	Fungus	Sisters (1)
Clavariadelphus truncates	Fungus	Bend/Ft. Rock (1) Crescent (1)
Cypripedium montanum	Vascular Plant	Sisters (8)
Elaphomyces anthracinus	Fungus	Sisters (1)
Elaphomyces subviscidus	Fungus	Bend/Ft. Rock (1)
Gastroboletus ruber	Fungus	Sisters (1)
Gautieria magnicellaris	Fungus	Sisters (1)

Scientific Name	Lifeform	District (No. of Sites)
Gymnomyces abietis	Fungus	Bend/Ft. Rock (1); Sisters (2)
Hydnotrya inordinata	Fungus	Bend/Ft. Rock (1)
Leptogium teretiusculum	Lichen	Sisters (1)
Polyozellus multiplex	Fungus	Bend/Ft. Rock (3)
Ramaria coulterae	Fungus	Sisters (2)
Ramaria rubripermanens	Fungus	Crescent (1)
Rhizopogon atroviolaceus	Fungus	Bend/Ft. Rock (1); Crescent (1)
Rhizopogon evadens var. *subalpinus*	Fungus	Bend/Ft. Rock (1); Sisters (1)

Analysis of Environmental Effects

Alternative 1

Native Plants and Native Plant Habitats

Direct impacts on vegetation caused by vehicles include crushing of foliage, root systems, and seedlings (Wilshire et al. 1978a). Plant foliage and stems can be damaged and plants uprooted by vehicles, so that actual plant damage may occur over an area much larger than the track width. Indirect effects of vehicles on vegetation include undercutting of root systems as vehicle paths are enlarged by erosion (Wilshire 1978a).

Vehicular routes with dirt surfaces can also be a significant source of dust (Brooks and Lair 2005) that can affect vegetation in the vicinity of the roads. Plant processes that may be affected by dust include photosynthesis, respiration, and transpiration due to blocked stomata and cell destruction, all of which could result in reduced plant growth, size, productivity, and/or survivorship (Ouren et al. 2007).

Impacts of off-highway vehicle activities include reduced vegetation cover and growth rates, and increased potential for non-native grasses and pioneering species to become established, thus altering plant communities (Ouren et al. 2007). In contrast, plant communities in undisturbed sites are dominated by native plants, invasive species are not increasing, plant growth and reproduction are vigorous, age-class structures are appropriate to the species, and canopy cover and vertical structure are adequate for dispersing the energy of precipitation runoff and promoting water infiltration (Ouren et al. 2007).

When soils are severely disturbed, vegetation cover can be reduced significantly and plant growth can be impaired (reviewed in Ouren et al. 2007). Davidson and Fox (1974) reported significant loss of herbaceous vegetation from motorcycle activity. Bolling and Walker (2000) reported that track roads had significantly lower total vegetative cover than control areas. Total plant density and cover were significantly lower in roads than in controls in the Mojave Desert, and long-lived plant species were greatly reduced in disturbed areas compared to controls (Prose et al. 1987).

Relatively low recreational traffic intensities cause a significant drop in plant cover, plant height, species richness and species diversity, leading to an increase in soil compaction and a decrease in soil organic matter and moisture content (reviewed in Kutiel et al. 2000). Kutiel et al. (2000) studied the response of soil and annual plants to various intensities of short-duration pedestrian and motorcycle traffic, and found that motorcycle passage had an immediate significant impact on annual plants at all traffic intensities.

Secondary effects from disturbances, such as off-highway vehicle use, include the proliferation of exotic plant species and a higher frequency of fire (Lovich and Bainbridge 1999). Effects of these impacts include alteration or destruction of macro- and micro-vegetation elements, establishment of annual plant communities dominated by exotic species, destruction of soil stabilizers, soil compaction, and increased erosion.

Natural recovery rates following disturbance depend on the nature and severity of the impact but are generally very slow. Recovery to pre-disturbance plant cover and biomass may take 50-300 years, while complete ecosystem recovery may require over 3,000 years (Lovich and Bainbridge 1999). Belnap (1995) discuss how desert soils may recover slowly from surface disturbances, resulting in increased vulnerability to desertification. As a result, recovery from compaction and decreased soil stability is estimated to take several hundred years. The nitrogen fixation capability of soil requires at least 50 years to recover (Belnap 1995).

Off-road vehicle activity has been shown to greatly increase soil compaction in areas of intense traffic (Adams et al. 1982a). Soil characteristics, particularly soil compaction, play important roles in the distribution, abundance, growth rate, reproduction, and size of plants. Soil compaction results in reduced water infiltration. As a result, overall plant productivity may be diminished (Ouren et al. 2007). When soils are severely disturbed, vegetation cover can be reduced significantly and growth can be impaired (Adams et al. 1982a; Bolling and Walker 2000, Prose et al. 1987, Webb and Wilshire 1980).

Even a few passes by vehicles can cause significant changes in soil properties (Ouren et al. 2007). Adams et al. (1982a) found reduced cover of desert annuals in tracks created by as few as one (on wet loamy sand) to 20 (on dry loamy sand) vehicle passes; the reduction in cover, however, was not due to fewer plants, but to smaller plant sizes. With tracks made by 1, 3, 10, and 20 vehicle passes, Adams et al. (1982a) found that annuals with large taproots decreased, whereas there was significantly greater cover of a non-native, fibrous-rooted grass. The fibrous root system allows for easier germination and root growth than large-taprooted species. Bolling and Walker (2000) found that there were many small individuals of creosote bush (*Larrea tridentata*), but larger plants were few or absent in OHV routes, whereas, in control plots, there were more large plants and fewer small ones. Reduced plant sizes are typical where the extent of soil compation inhibits their roots from penetrating to deeper soil levels (Ouren et al. 2007). Overall, the extent of immediate effects increases with the frequency of OHV passes. For example, Webb (1983) found that after a single pass, annual plants on an OHV route remained intact, but most were destroyed after 10 passes.

Wilshire et al. (1978b) found physical and chemical impacts reduce the land's capability of restoring its vegetative cover. Both the loss of plant cover and the physical changes caused by vehicles promote erosion. Their study determined that erosion rates significantly exceeded Federal and local standards.

Road cuts and the associated traffic have detrimental effects on soil nutrients and microbially-controlled processes (e.g., Nitrogen cycling) (Webb and Wilshire 1980). These changes can indirectly affect plant community development for many years after the disturbance. Knapp (1991) found significant differences in plant community structure between disturbed and undisturbed sites 77 years following disturbance on abandoned roadways in mining towns in Montana. The degree of soil compaction may be particularly important for determining plant succession (Knapp 1991).

Soil disturbance and compaction increases the potential for invasive, non-native annuals and other early successional plants to establish rapidly in OHV routes, whereas native perennials may require at least 5 years to become established (Ouren et al. 2007). Soil compaction was significant in most disturbed areas 40 years after military camps were abandoned (Prose et al. 1987). Other studies reported that various desert soils remained compacted for similar or longer periods of time, probably because animal burrowing and plant root growth are the primary agents of soil-loosening in low desert valleys but animals and plants have difficulty displacing highly-compacted soils (Prose et al. 1987).

Indirect effects can be invasion by invasive plants into disturbed areas. In general, grasslands, riparian areas, and relatively dry, open forests are more susceptible to invasion than are dense moist forests and high montane areas (USDA Forest Service 2005a, p. 3-40; Interior Columbia Basin Ecosystem Management Project 2000). The former have frequent gaps in plant cover, which favor invasive plant establishment, whereas the latter have relatively closed plant cover or have extreme climate or soils, which are tolerated by fewer invasive plant species.

Invasive plants tend to colonize disturbed ground along roads, highways, utility (powerline and gas) corridors, recreational residences, and along trails and in campgrounds and quarries. Once established, invasive plants begin to spread, displacing native vegetation. Eastside forests are more susceptible to invasive plants for the above reasons.

The above research has demonstrated that motorized recreation can impact individual plants and their habitats. After soil is compacted, will native vegetation recover and how long would this take? Several studies investigated recovery of vegetation following disturbances. Knapp (1991) studied the response of semi-arid vegetation following the abandonment of mining towns in south-western Montana, and found considerable differences remained after 45-77 years between disturbed and undisturbed sites. Disturbed sites favored the invasion of introduced grass species. Recovery rates of vegetation and compacted soil were studied at a ghost town in southwestern Nevada (Webb and Wilshire 1980). Soils were still highly compacted after 51 years; recovery time was estimated to take at least 100 years. After 51 years, the composition and quality of vegetation in the streets of the town were still significantly different from those of the adjacent undisturbed area (Webb and Wilshire 1980). Vegetation in the town site consists of short-lived perennials whereas the surrounding undisturbed vegetation consists mainly of long-lived perennials. Generally, annuals (e.g., Russian thistle, *Salsola kali*) are the first colonizers in disturbed soil at this ghost town, followed by short-lived perennials (e.g., rice grass, *Oryzopsis*, and stipa (*Stipa* spp.) and then by medium- and long-lived perennials. This study indicates an extremely long recovery time is needed for recovery of vegetation, if the vegetation ever recovers. Ouren et al. (2007) state that some plant responses are likely to lag behind changes in soil properties, and, by the time effects are detected in plants, site recovery could be more difficult and lengthy.

Motorized Travel Off of Designated Routes

On the Deschutes National Forest, 39% of the acres of mapped Plant Association Groups are open to motorized travel off of designated routes under Alternative 1 (Table 3-122), Appendices B-4.2.1 and B-4.2.3). On the Ochoco National Forest and Grassland, 60% are open to motorized travel off of designated routes. As discussed above, motorized vehicles and travel can impact native plants and native plant habitats. Compared to Alternatives 2 and 3, in which 100% of the acres are closed to motorized travel off of designated routes, Alternative 1 provides the least amount of protection to native plants and native plant habitats from motorized travel off of designated routes.

Table 3-122 Percent of PAG acres closed and open for motorized travel off designated routes under Alternative 1 (Existing Condition) and Alternatives 2 and 3 for the Forests and Grassland[79].
See Appendices B-4.2.1 and B-4.2.3 for more information.

Unit	Alt. 1 % Closed	Alt. 1[80] % Open	Alt. 2 & 3 % Closed	Alt. 2 & 3 % Open
Deschutes NF	**61** (987,550 ac.)	**39** (625,459 ac.)	**99.9** 1,611,912 ac.)	**0.01** (915 ac.)
Ochoco NF and CRNG	**40** (291,589 ac.)	**60** (429,773 ac.)	**100** 721,266 ac.)	**0.003** (20 ac.)
Summary Conclusion	**Alt. 1 provides least protection to native plants and native plant habitats from motorized use.**		**Alts. 2 and 3 increase protection to native plant habitats from motorized use because 100% of the mapped acres of PAGs are closed to motorized travel off designated routes.**	

[79] To compare the alternatives for effects to native plants and native plant habitats from motorized travel off of designated routes, GIS was used to calculate the number of acres and percentage of PAGs, special habitats, TES plants, other rare or uncommon plants, and invasive plants for the different designations under each alternative.
[80] Areas that are seasonally open were analyzed as open year-round because impacts to native plants habitats could occur at any time during the open season.

Motorized Access for Dispersed Camping

Table 3-123 summarizes the information from Appendices B-4.2.2 and B-4.2.4. Since the majority of acres of native plant habitats (mapped as PAGs) are open for motorized access for dispersed camping (72% on the Deschutes NF and 83% on the Ochoco NF and Grassland), Alternative 1 provides the least protection and the greatest opportunity for damage to native plant habitats from motorized recreation. This includes indirect effects such as colonization of disturbed habitats by invasive plants.

Table 3-123. Percent of PAG acres closed and open for motorized access for dispersed camping under the different alternatives[81].
See Appendices B-4.2.2 and B-4.2.4 for more information.

Unit	Alt. 1 % Closed	Alt. 1 % Open	Alt. 2 & 3 % Closed	Alt. 2 % Open & Alt. 3 Open Upland Provisions	Alt. 2 & 3 % Open Upland Provisions	Alt. 2 & 3 % Open Riparian Provisions
Deschutes NF	**28** (446,881 ac.)	**72** (1,166,137 ac.)	**74** (1,196,287 ac.)	**23** (365,494 ac.)	**2** (31,243 ac.)	**1** (19,795 ac.)
Ochoco NF and CRNG	**31** (221,522 ac.)	**69** (499,840 ac.)	**83** (597,076 ac.)	**10** (69,700 ac.)	**2** (15,286 ac.)	**5** (39,203 ac.)

Summary Conclusions		
Alt. 1 provides least protection to native plant habitats because the majority of acres are open for motorized access for dispersed camping with no special provisions	**Alternatives 2 & 3 provide greater protection than Alt. 1 because more acres of habitat are closed to motorized access for dispersed camping (74% on Deschutes NF; 83% on Ochoco NF and Grassland).**	**Alt. 3 provides the most protection because all areas open to motorized access for dispersed camping have special provisions, whereas some upland areas in Alternative 2 have no provisions (23% on the Deschutes NF; 10% on the Ochoco NF and Grassland).**

Special Habitats

Motorized use, especially concentrated and repeated use, can degrade native plant habitats by denuding areas of understory vegetation and compacting soils. Of particular concern are special habitats (areas which sustain unusual and/or particularly rich biological diversity) and rare plants and their habitats.

Motorized Travel Off of Designated Routes

Table 3-124 summarizes data shown in Appendices B-4.2.5 and B-4.2.7. Alternative 1 provides less protection to special habitats from motorized travel off of designated routes than Alternatives 2 and 3 because 13% of the acres occupied by special habitats are still open under Alternative 1 on the Deschutes National Forest and 73% are open on the Ochoco National Forest. Under Alternatives 2 and 3, 100% of special habitat acres are closed to motorized travel off of designated routes.

[81] To compare the alternatives for effects to native plants and native plant habitats in areas open to motorized access for dispersed camping, GIS was used to buffer each travel route by 300 feet on each side. This buffer was overlaid onto GIS layers for PAGS, special habitats layer, and inventoried TES, other rare or uncommon, and invasive plant sites.

Table 3-124. Percent of Special Habitat acres closed and open for motorized travel off of designated routes under the three alternatives.
See Appendices B-4.2.5 and B-4.2.7 for more information.

Unit	Alt. 1 % Closed	Alt. 1 % Open	Alt. 2 & 3 % Closed	Alt. 2 & 3 % Open
Deschutes NF	87 (63,499 ac.)	13 (9,837 ac.)	100 (73,193 ac.)	0 (0 ac.)
Ochoco NF and CRNG	27 (25,625 ac.)	73 (69,957 ac.)	100 (95,579 ac.)	0
Summary Conclusion	**Alternative 1 provides less protection to special habitats**		**Alternative 2 & 3 provide greater protection to special habitats**	

Motorized Access for Dispersed Camping

Under Alternative 1, 45% of special habitat acres on the Deschutes NF and 90% on the Ochoco NF and Grassland are open to motorized access for dispersed camping. (Table 3-125) Alternative 1 provides the least protection to special habitats in areas open to motorized access for dispersed camping compared to Alternatives 2 and 3, in which the majority (86% on the Deschutes NF; 85% on the Ochoco NF and Grassland) of special habitats would be closed.

Table 3-125. Percent of Special Habitat acres closed and open for motorized access for dispersed camping (motorized access for dispersed camping) under the different alternatives.
See Appendices B-4.2.6 and B-4.2.8 for more information.

Unit	Alt. 1 % Closed	Alt. 1 % Open	Alt. 2 % Closed	Alt. 2 % Open & Alt. 3 Open Upland Provisions	Alt. 2 & 3 % Open Upland Provisions	Alt. 2 & 3 % Open Riparian Provisions
Deschutes NF	**55** (40,103 ac.)	**45** (33,234 ac.)	**86** (63,222 ac.)	**7** (5,020 ac.)	**4** (2,659 ac.)	**3** (2,366 ac.)
Ochoco NF and CRNG	**10** (9,846 ac.)	**90** (85,736 ac.)	**85** (81,492 ac.)	**8** (7,376 ac.)	**1** (1,419 ac.)	**6** (5,294 ac.)
Summary Conclusions	**Alt. 1 provides the least protection to special habitats in areas open to motorized access for dispersed camping.**		**Alternatives 2 and 3 provide greater protection to special habitats than Alt. 1 in areas open to motorized access for dispersed camping. Alt. 3 provides more protection than Alt. 2.**			

Threatened, Endangered, and Sensitive Plants

Appendix B-4.2.13 contains the Biological Evaluation for TES plants for this project. There are no federally listed Threatened or Endangered plant species or habitats documented or suspected to occur on the Forests and Grassland. Therefore, this analysis only refers to Sensitive plants.

On the Forests and Grassland, several conservation documents have been completed. Off-road vehicle disturbance is identified as a threat to pumice grape fern (*Botrychium pumicola*), Henderson's and Wallowa needlegrasses (*Achnatherum hendersonii* and *A. wallowaensis*), and Peck's mariposa lily (*Calochortus longebarbatus* var. *peckii*) (Powers 2008; Dewey 2007; Dewey 2008). Though the Conservation Strategy for Peck's penstemon (*Penstemon peckii*) does not directly identify off-highway motorized use as a threat, the Strategy does identify that habitat loss and fragmentation as threats to this species (Pajutee 2008).

A Biological Evaluation (**Appendix B-4.2.13**) was prepared to evaluate the effects of the alternatives on Sensitive plants (no Threatened or Endangered plants are documented or suspected to occur on the Forests and Grassland). The following table (Table 3-126) summarizes the conclusions of the Biological Evaluation. More detailed information can be found in Table 2 of the Biological Evaluation in **Appendix B-4.2.13**.

Mapped population acres were used to compare the alternatives. This represents occupied habitat. For all species, there may be potential habitat that is not yet occupied or known to be occupied, but the Forests and Grassland do not have detailed mapping of understory vegetation that would allow adequate analysis for 77 sensitive plant species.

In this analysis, a determination was made of MIIH if any of the mapped population acres occur in areas open to motorized access for dispersed camping without any special provisions. The assumption was made that the species could be impacted if motorized dispersed camping can occur anywhere. For some species, it might only be a small portion of the mapped habitat; for example, under Alternative 2, 8% of the mapped acres for Henderson's needlegrass (*Achnatherum hendersonii*) occur in upland areas open for motorized access for dispersed camping with no special provisions. Therefore, even though 92% of the occupied acres for this species would occur in areas with special provisions, a determination of MIIH was made in order to be conservative in predicting potential effects.

Table 3-126. Alternative Effects Summary to mapped Sensitive Plant Populations and Habitat for the Travel Management Project area.
See Table 2 of the Biological Evaluation for more detailed information (Appendix B-4.2.13).
Codes:

NI – No Impact
MIIH = May Impact Individuals or Habitat, but will not likely contribute to a trend towards Federal Listing or cause a loss of viability to the population or species;
MIFV = Will Impact Individuals or Habitat With A Consequence That The Action May Contribute To A Trend Towards Federal Listing Or Cause A Loss Of Viability To The Population or Species
BI = Beneficial Impact.

	Motorized Travel Off of Designated Routes		Motorized Access for Dispersed Camping		
Species	**Alt. 1**	**Alt. 2**	**Alt. 1**	**Alt. 2**	**Alt. 3**
Vascular Plants					
Achnatherum hendersonii Henderson's needlegrass	MIIH	BI	MIIH	MIIH	NI
Achnatherum wallowaensis Wallowa needlegrass	MIIH	BI	MIIH	NI	NI

	Motorized Travel Off of Designated Routes		Motorized Access for Dispersed Camping		
Species	**Alt. 1**	**Alt. 2**	**Alt. 1**	**Alt. 2**	**Alt. 3**
Agoseris elata tall agoseris	NI	NI	MIIH	MIIH	NI
Arnica viscosa Mt. Shasta arnica	NI	NI	NI	NI	NI
Astragalus peck Peck's milkvetch	MIIH	BI	MIIH	BI	BI
Astragalus tegetarioides Deschutes milkvetch	MIIH	BI	MIIH	MIIH	NI
Botrychium ascenden trianglelobe moonwort	MIIH	BI	MIIH	BI	BI
Botrychium crenulatum scalloped moonwort	MIIH	BI	MIIH	MIIH	NI
Botrychium minganense Mingan moonwort	MIIH	BI	MIIH	MIIH	NI
Botrychium montanum mountain moonwort	MIIH	BI	MIIH	BI	NI
Botrychium paradoxum Peculiar moonwort	NI	BI	MIIH	BI	BI
Botrychium pumicola pumice grape-fern	MIIH	BI	MIIH	MIIH	NI
Calochortus longebarbatus var. *peckii* Peck's mariposa lily	MIIH	BI	MIIH	MIIH	NI
Carex capitata capitate sedge	NI	NI	MIIH	BI	BI
Carex lasiocarpa var. *americana* slender sedge	NI	NI	MIIH	BI	BI
Castilleja chlorotica green-tinged paintbrush	BI	BI	MIIH	NI – OffDR MIIH – MADC	NI

	Motorized Travel Off of Designated Routes		Motorized Access for Dispersed Camping		
Species	**Alt. 1**	**Alt. 2**	**Alt. 1**	**Alt. 2**	**Alt. 3**
Cyperus acuminatus short-pointed cyperus	NI	NI	MIIH	BI	NI
Gentiana newberryi var. *newberryi* alpine gentian	MIIH	BI	MIIH	MIIH	NI
Lobelia dortmanna Dortmann's cardinalflower	NI	NI	NI	NI	NI
Lomatium ochocense Ochoco lomatium	NI	NI	MIIH	BI	BI
Lycopodiella inundata inundated clubmoss	NI	NI	MIIH	BI	BI
Penstemon peckii Peck's penstemon	DES = MIIH OCH = NI	DES = BI OCH = BI	DES = MIIH OCH = NI	DES = MIIH OCH = NI	DES = NI; OCH = NI
Rorippa columbiae Columbia yellowcress	NI	NI	NI	NI	NI
Scheuchzeria palustris ssp. *americana* rannoch-rush	NI	NI	NI	NI	NI
Schoenoplectus subterminalis (formerly *Scirpus subterminalis*) swaying bulrush	NI	NI	NI	NI	NI
Utricularia minor lesser bladderwort	MIIH	BI	MIIH	BI	BI
Bryophytes					
Helodium blandowii moss	DES = NI OCH = NI	DES = NI OCH = NI	DES = MIIH OCH = MIIH	DES = NI OCH = NI	DES = NI OCH = NI
Rhizomnium nudum rhizomnium moss	MIIH	BI	MIIH	BI	BI

	Motorized Travel Off of Designated Routes		Motorized Access for Dispersed Camping		
Species	**Alt. 1**	**Alt. 2**	**Alt. 1**	**Alt. 2**	**Alt. 3**
Schistostega pennata luminous moss	NI	NI	MIIH	BI	BI
Tomentypnum nitens moss	MIIH	BI	MIIH	BI	BI
Tritomaria exsectiformis liverwort	BI	BI	MIIH	BI	BI
Lichens					
Dermatocarpon. luridum Silverskin lichen	DES = NI OCH = MIIH	DES = NI OCH = BI	DES = MIIH OCH = MIIH	DES = BI OCH = BI	DES = BI OCH - BI
Texosporium sancti-jacobi lichen	MIIH	BI	MIIH	BI	BI
Fungi					
Alpova alexsmithii fungus	NI	NI	NI	NI	NI
Helvella crassitunicata fungus	NI	NI	MIIH	BI	BI
Hygrophorus caeruleus fungus	MIIH	BI	MIIH	BI	BI
Ramaria amyloidea fungus	NI	NI	NI	NI	NI

Motorized Travel Off of Designated Routes

In Alternative 1, 71% of acres occupied by sensitive plants on the Ochoco NF and Grassland and 12% of acres on the Deschutes NF are open for motorized travel off of designated routes (Table 3-127), whereas, under Alternatives 2 and 3, 100% of occupied sensitive plant acres are closed. A greater number of individual sensitive plant species and/or their habitats may be impacted under Alternative 1 due to motorized travel off of designated routes than under Alternatives 2 and 3 (Table 3-126).

Open habitats, such as meadows and drier forests, may be more vulnerable to off-road travel due to the fact that open habitats are more easily accessed by motor vehicles compared to areas with denser vegetation. Species that occur in these habitats include Henderson's and Wallowa needlegrasses (found in open scablands), Peck's penstemon (found in moist swales and intermittent streams in ponderosa pine forests), Peck's milk-vetch (mostly found in non-forested, open areas), and *Botrychium* species and Peck's mariposa lily (found in meadows).

At this time, there are no known sensitive plants on the Forests and Grassland that are impacted by current levels of motorized travel off of designated routes to the point at which the species is declining and may need to be

federally listed in order to be protected. Therefore, the effects determination for those species that occur in areas open for motorized travel off of designated routes is MIIH instead of WIFV (*see definitions in* ***Table 3-X(15)***).

For some sensitive plant species, a determination of No Impact was made. Table 2 of the Biological Evaluation (Appendix B-4.2.13) provides more detailed information about the effects determination. For example, Ochoco lomatium (*Lomatium ochocense*) populations occur in areas closed to motorized travel in Alternative 1 and this restriction would continue with Alternatives 2 and 3. Therefore, there is no change from the current condition, and the populations would not be impacted regardless of the selected alternative.

Table 3-127. Percent of acres occupied by sensitive plants closed and open for motorized travel off designated routes under Alternative 1 (Existing Condition), Alternative 2 (Proposed Action) and Alternative 3 for the Forests and Grassland.
See Appendix B-4.2.9 for more information.

Unit	Alt. 1 % Closed	Alt. 1 % Open	Alt. 2 & 3 % Closed	Alt. 2 & 3 % Open
Deschutes NF	88	12	100	0
Ochoco NF and CRNG	29	71	100	0
Summary Conclusion	**Alternative 1 provides less protection to sensitive plants and habitat**		**Alternatives 2 & 3 provide greater protection to sensitive plants and habitat**	

Motorized Access for Dispersed Camping

Under Alternative 1, 95% of acres occupied by sensitive plants on the Ochoco NF and Grassland and 32% on the Deschutes NF are within areas open for motorized access for dispersed camping (Table 3-128). Alternative 1 provides less protection to sensitive plants compared to Alternatives 2 and 3, which close 70% of occupied sensitive plant habitat on the Deschutes NF and 71% on the Ochoco NF/Grassland to motorized access for dispersed camping.

Table 3-128. Percent of acres occupied by sensitive plants closed and open for motorized access for dispersed camping under the different alternatives.
See Appendix B-4.2.10 for more information.

Unit	Alt. 1 % Closed	Alt. 1 % Open	Alt. 2 & 3 % Closed	Alt. 2 % Open & Alt. 3 Open Special provisions non-riparian	Alt. 2 & 3 % Open Special provisions non-riparian	Alt. 2 & 3 % Open Special provisions -riparian
Deschutes NF	68	32	70	16	5	6
Ochoco NF and CRNG	5	95	71	6	1	22
Summary Conclusions	**Alternative 1 provides less protection to TES plants.**		**Alternative 2 provides a higher level of protection to TES plants than Alternative 1. Alternative 3 provides the most protection.**			

Other Rare or Uncommon Plants

As discussed earlier, other rare or uncommon plants are identified on the Deschutes National Forest for protection from management activities. These species are often associated with late seral and/or old growth habitats.

Motorized Travel Off of Designated Routes

Table 3-129 summarizes the differences between the three alternatives in the percent of acres occupied by other rare or uncommon plants that are closed or open to motorized travel off of designated routes. Though only 4% of acres are open under Alternative 1, this alternative does not provide as much protection as Alternatives 2 and 3, in which 100% of the occupied habitat is closed to motorized travel off of designated routes.

Table 3-129. Percent of acres occupied by other rare or uncommon plants closed and open for motorized travel off designated routes under Alternative 1 (Existing Condition) and Alternatives 2 and 3 for the Deschutes National Forest.
See Appendix B-4.2.11 for more information.

Unit	Alt. 1 % Closed	Alt. 1 % Open	Alt. 2 & 3 % Closed	Alt. 2 & 3 % Open
Deschutes NF	**96** (2.8 ac.)	**4** (0.1 ac.)	**100** (2.9 ac.)	**0**
Summary Conclusion	**Alternative 1 provides less protection**		**Alternatives 2 and 3 provide greater protection**	

Motorized Access for Dispersed Camping

Under Alternative 1, more acres occupied by other rare or uncommon plants are closed to motorized access for dispersed camping (75%; Table 3-130) than under Alternatives 2 and 3. However, Alternative 1 allows unrestricted access for dispersed camping (i.e., no special provisions), whereas Alternatives 2 and 3 incorporate special provisions. Only 5% of the acres occupied by other rare or uncommon plants are within dispersed camping areas with no special provisions (Alternative 2). Because Alternative 1 allows unrestricted motorized access for dispersed camping, Alternative 1 has a greater potential adverse impact on other rare or uncommon plants.

Table 3-130. Percent of acres occupied by other rare or uncommon plants closed and open for motorized access for dispersed camping (motorized access for dispersed camping) under the different alternatives.
See Appendix B-4.2.12 for more information.

Unit	Alt. 1 % Closed	Alt. 1 % Open	Alt. 2 % Closed	Alt. 2 % Open & Alt. 3 Open Upland Provisions	Alt. 2 & 3 % Open Upland Provisions	Alt. 2 & 3 % Open Riparian Provisions
Deschutes NF	**75** (2.2 ac.)	**25** (0.7 ac.)	**60** (0.18 ac.)	**5** (0.03 ac.)	**6**	**29** (0.1 ac.)
Summary Conclusions	**Alternative 1 provides less protection because motorized access for dispersed camping with no special provisions**		**Alternatives 2& 3 provide greater protection than Alternative 1.**			

Alternatives 2 and 3

Native Plants and Native Plant Habitats

Overall, Alternatives 2 and 3 would substantially reduce potential impacts to native plant habitats, including special and rare plant habitats, by substantially reducing the amount of acres available for motorized travel off of

designated routes. Some native plant habitats within 300' of roads open for motorized access for dispersed camping could continue to have localized impacts, yet the proposed action does incorporate special provisions within sensitive areas adjacent to streams, wetlands, and water bodies. The special provisions would limit motorized access to no closer than 30'. to the edge of the stream or water body.

Motorized Access Off of Designated Routes

Alternatives 2 and 3 provide greater protection than Alternative 1 to native plant habitats from motorized recreation because 100% of the acres of native plant habitats (mapped as Plant Association Groups) are closed to motorized travel off designated routes (Table 3-122).

Motorized Access for Dispersed Camping

Alternatives 2 and 3 provide greater protection than Alternative 1 to native plant habitats because 74% of the acres are proposed to be closed to motorized access for dispersed camping compared to only 28% in Alternative 1 (Table 3-123).

Alternative 2 provides less protection than Alternative 3 to native plant habitats because 23% of mapped upland acres are open to motorized access for dispersed camping with no special provisions, whereas 100% of acres in Alternative 3 have special provisions. Alternative 3 confines motorized access for dispersed camping to existing, designated, or defined campsites, therefore limiting motorized use in surrounding habitats. This provides greater protection to native plant habitats.

Special Habitats

Motorized Travel Off of Designated Routes

Alternatives 2 and 3 provide greater protection than Alternative 1 to special habitats because 100% of these areas closed to motorized access off of designated routes (Table 3-124).

Motorized Access for Dispersed Camping

Alternatives 2 and 3 provide greater protection to special habitats than Alternative 1 because the majority (86% on the Deschutes NF; 85% on the Ochoco NF and Grassland) of special habitat acres would be closed to motorized access for dispersed camping compared to Alternative 1 (Table 3-125). In Alternative 1, only 55% on Deschutes NF and 10% on Ochoco NF/Grassland would be closed.

Of the acres open to motorized access for dispersed camping, Alternative 3 provides greater protection than Alternative 2 because of special provisions. Under Alternative 2, 7% of special habitat acres on the Deschutes and 8% on the Ochoco/Grassland occur in upland areas open to motorized access for dispersed camping without special provisions. Therefore, Alternative 2 does not provide as much protection as Alternative 3, in which all areas open for motorized access for dispersed camping have special provisions.

Threatened, Endangered, and Sensitive Plants

As discussed earlier, there are no federally listed Threatened or Endangered plant species or habitats documented or suspected to occur on the Forests and Grassland. Therefore, this analysis only refers to Sensitive plants.

See the discussion in Alternative 1 for more information on the biological evaluation.

Motorized Travel Off of Designated Routes

Alternatives 2 and 3 prohibit motorized travel off of designated routes. On the Ochoco NF and Grassland, 71% of sensitive plant acres would be open for motorized travel off of designated routes under Alternative 1, but 100% of the acres would be closed under Alternatives 2 and 3. For many sensitive plant populations, this results in a Beneficial Impact (Table 3-126, Appendix B-4.2.9). This increases the protection of sensitive plants compared to current management in Alternative 1.

Motorized Access for Dispersed Camping

Alternatives 2 and 3 either increase the protection to sensitive plants or do not result in an adverse change (e.g., a determination of No Impact is made for all alternatives) (Table 3-126; Table 2 in Appendix B-4.2.13). More acres of sensitive plants are closed to motorized access for dispersed camping in Alternatives 2 and 3 than in Alternative 1 (Table 3-128).

For many sensitive plant species, Alternative 2 increases the protection to sensitive plants and changes a "May Impact Individuals and or Habitat" (MIIH) determination in Alternative 1 to a Beneficial or No Impact determination. For some species, Alternative 2 would result in the same MIIH determination as in Alternative 1 (e.g., Peck's mariposa lily). As discussed in Alternative 1, a determination was made of MIIH if any of the mapped population acres occur in areas open to motorized access for dispersed camping without any special provisions. However, in most cases, the percent of acres open to motorized access for dispersed camping without special provisions is much less than what would occur in Alternative 1. For example, on the Ochoco NF and Grassland, 95% of the acres occupied by sensitive plants are open under Alternative 1 to motorized access for dispersed camping; in Alternatives 2 and 3, 71% of the acres would be closed to this use. Alternatives 2 and 3 provide greater protection to sensitive plant populations than Alternative 1.

Of the two action alternatives, Alternative 3 results in a determination of either No Impact or Beneficial Impact for all mapped sensitive plant populations. Alternative 3 provides greater protection than Alternative 2 because all areas open for motorized access for dispersed camping have special provisions (i.e., confine camping to existing, designated, or defined sites) (Table 3-128).

Other Rare or Uncommon Plants

Motorized Travel Off of Designated Routes

Alternatives 2 and 3 provide equally high levels of protection because 100% of occupied acres of other rare or uncommon plants are closed to motorized travel off of designated routes (Table 3-129). This results in a beneficial impact to other rare or uncommon plant species.

Motorized Access for Dispersed Camping

In Alternatives 2 and 3, 40% of the acres occupied by other rare and uncommon are open for motorized access for dispersed camping. However, of the 40%, only 5% are open in upland areas without special provisions (Table 3-130). The remaining 35% of acres are open with special provisions that confine motorized access for dispersed camping to existing, designated, or defined sites. Both Alternatives 2 and 3 increase the protection to other rare or uncommon plants over Alternative 1, which allows unrestricted motorized access for dispersed camping (i.e., no special provisions). However, Alternative 2 does not provide as much protection as Alternative 3 because 5% of occupied acres are open to motorized access for dispersed camping without provisions. Special provisions under Alternatives 2 and 3 increase the protection to these unique species over Alternative 1.

Range

Executive Summary

This section summarizes the analysis of the effects from implementing the actions proposed in this EIS on range activities on the Deschutes and Ochoco National Forests, and Crooked River National Grassland

Under Alternatives 2 and 3, the majority of the acreage that affects grazing operations would be closed to motorized travel off designated routes (see Table Range-3 below and Tables B-7.1.6 and B-7.1.7 in Appendix B-7). Based upon past observations it is expected that this would result in a considerable reduction in the amount of damage to range improvements (both intentional and accidental) as well as a proportionate reduction in the amount and degree of harassment and killing of permitted domestic livestock. Both alternatives would result in an indirect reduction of the spread and establishment of invasive plant species, as rangeland plant associations tend to be highly susceptible and sensitive to invasive plant infestation and invasion (see Invasive Plants section).

Cumulatively, Alternative 2 is expected to result in overall improved distribution of domestic livestock and a net positive impact on grazing and grazing operations. This is expected because the action alternatives would reduce obstacles to livestock travel and increase forage quantity and improve forage quality. The special provision in Alternative 3 limiting motorized access for dispersed camping in riparian areas, would be expected to slightly reduce the dispersal of cattle (on active cattle allotments) associated with occupied dispersed campsites.

Cumulatively the effects of Alternative 3 would be indistinguishable from Alternative 2.

Affected Environment

The Deschutes National Forest administers 34 grazing allotments, of which 6 are active, 19 are vacant, and 9 are closed to permitted livestock grazing. The Ochoco National Forest and Crooked River National Grassland, administer 79 grazing allotments, of which 66 are active, 6 are vacant, and 7 are closed to permitted livestock grazing. Of the 72 active grazing allotments on both Forests, 68 are cattle allotments, three are sheep allotments (Canyon Creek, Reservoir and Trout Creek on the Lookout Mountain Ranger District) and one is a saddle and draft horse allotment (East Winter on the Crooked River National Grassland). (Appendix B-7 which lists Allotment Status by Forest and District.)

On the active grazing allotments, six on the Deschutes National Forest and sixty six on the Ochoco National Forest (including the Crooked River National Grassland), approximately 132,000 acres and 231,000 acres respectively are currently closed to motorized travel off designated routes and approximately 37,000 acres and 408,000 acres respectively are open at least seasonally to motorized travel off designated routes. On the vacant grazing allotments, 19 on the Deschutes National Forest and six on the Ochoco National Forest (including the Crooked River National Grassland), approximately 190,000 acres and 2,500 acres respectively, are currently closed to motorized travel off designated routes and approximately 204,000 acres and 5,300 acres respectively are open at least seasonally to motorized travel off designated routes. A comparison will not be conducted for grazing allotments in a closed status because the potential to impact grazing and/or grazing operations within closed allotments is very low. The table below summarizes this information.

Table 3-131: Summary of motorized access off designated routes (approximate acres) by Allotment Status and Forest

ALLOTMENT STATUS	FOREST	NUMBER OF ALLOTMENTS	CLOSED OFF DESIGNATED ROUTES	OPEN OFF DESIGNATED ROUTES
Active	Deschutes	6	132,000	37,000
	Ochoco	66	231,000	408,000
	Combined	**72**	**363,000**	**445,000**
Vacant	Deschutes	19	190,000	204,000
	Ochoco	6	2,500	5,300
	Combined	**25**	**192,500**	**209,300**

Tables B-7.1.2 & B-7.1.3 in Appendix B-7 (Range) present motorized access off designated routes (acres) information in greater detail for both forests respectively.

On the active grazing allotments, six on the Deschutes National Forest and sixty six on the Ochoco National Forest (including the Crooked River National Grassland), approximately 45,000 acres and 162,000 acres respectively are currently closed to motorized access for dispersed camping and approximately 123,000 acres and 475,000 acres respectively are open at least seasonally to motorized access for dispersed camping. On the vacant grazing allotments 19 on the Deschutes National Forest, approximately 108,000 acres and 2,200 acres respectively are currently closed to motorized access for dispersed camping and approximately 286,000 acres and 5,600 acres are open at least seasonally to motorized access for dispersed camping, while approximately 600 acres on the Deschutes National Forest are open to motorized access for dispersed camping at designated sites only.

Table 3-132: Summary of motorized access for dispersed camping (approximate acres) by Allotment Status and Forest

ALLOTMENT STATUS	FOREST	NUMBER OF ALLOTMENTS	CLOSED TO MOTORIZED ACCESS FOR DISPERSED CAMPING	OPEN TO MOTORIZED ACCESS FOR DISPERSED CAMPING	DESIGNATED SITES FOR DISPERSED CAMPING
Active	Deschutes	6	45,000	123,000	0
	Ochoco	66	162,000	475,000	0
	Combined	**72**	**207,000**	**598,000**	**0**
Vacant	Deschutes	19	108,000	286,000	600
	Ochoco	6	2,200	5,600	0
	Combined	**25**	**110,200**	**291,600**	**600**

Tables B-7.1.4 & B-7.1.5 in Appendix B-7 (Range) present motorized access for dispersed camping (acres) information in greater detail for both forests respectively.

Current allotments for both forests are displayed on Figure 3-19 below.

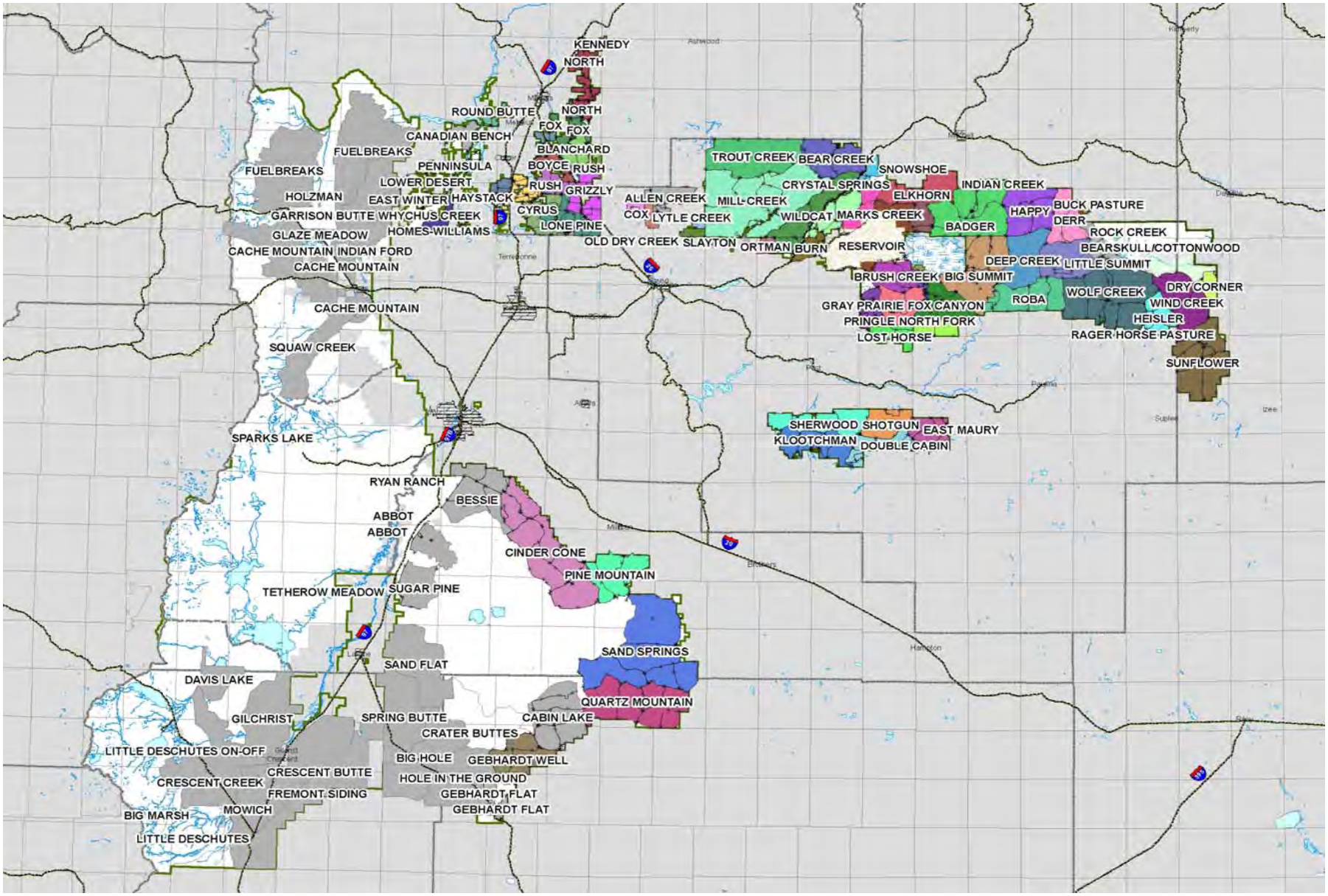


Figure 3-19. Range Map.

Grazing, Roads and Dispersed Recreation

Cattle use roads/roadsides (both open and closed) as a route for travel/movement. Roads are used to a greater degree by cattle as routes for longer trailing and as slopes increase and/or vegetation makes off road travel more difficult. Sheep are generally affected to a lesser degree by obstructing vegetation and prefer moderate to steeper slopes. Cattle typically avoid campsites where human activity is occurring although they will readily enter campsites where no activity is occurring. Sheep will generally be unaffected by campsites and human activity and will go where they are herded.

Range improvement functionality is imperative for the management of cattle, although it is of much less importance for managing sheep. Both water developments and fences are placed in order to provide for control and dispersal of cattle. Cattle will typically only utilize forage with a half a mile to a mile from water. The lower end of this range is applicable on landscapes where travel is more difficult (steeper slopes, more vegetative obstruction), while the higher end of this range applies to landscapes where travel is easier (flatter with less trees and brush) (Valentine, 1989)(USDA and USDI, 1989). Fences keep cattle within certain areas and out of other areas. Therefore fences are management tools that help regulate the timing, amount and location of grazing by cattle. The functionality of either type of range improvement is impacted by the public at large.

The following table presents several common ways that the integrity of range improvements are compromised by the public at large (personal observations of the Range Conservationist).

Table 3-133 Incidents that compromise range improvement functionality

RANGE IMPROVEMENT TYPE	COMMON INCIDENTS THAT COMPROMISE FUNCTIONALITY
Spring development	Troughs shot. Troughs stolen. Water pipes diverted to RVs. Dispersed camp sites prevent livestock access.
Wells	Switches turned off. Switches turned on resulting in burned out pumps. Switches turned on in the winter and system charged resulting in frozen and broken lines. Drain valves opened. Power cable stolen. Meter box vandalized.
Steel post/barbed wire fence	Steel posts stolen out of fence. Fence cut. Gates left open. Objects placed over wire to hold it down. Motor vehicle driving through fences both intentionally and accidentally.
Corrals and Post/pole fences	Fences cut with chainsaws for firewood. Gates stolen. Corrals used by recreating public for horses/pack animals.

Livestock harassment and even the killing of livestock is another impact to grazing and/or grazing operations that appears to be correlated to the presence and density of general members of the public on the landscape.

Analysis of Environmental Effects

The greatest potential for impact of the activities under analysis on rangeland vegetation is in the indirect effect on the spread and establishment of invasive plant species. Rangeland plant associations (non-forested plant associations) tend to be highly susceptible and sensitive to invasive plant infestation and invasion. Please refer to the invasive plants report and discussions in the EIS for descriptions of the affected environment and alternative effects relative to invasive plants and their affect on non-forest plant associations.

Alternative 1

Under the No Action alternative, the acreage open and closed to motorized travel off designated routes and open and closed to motorized access for dispersed camping will remain the same as described under the Affected Environment section.

The ability to manage livestock grazing is reduced and grazing operations are impacted when incidents of damage to range improvements coincide with active grazing operations (grazing allotments in active status). Tables Range-1 above and B-7.1.2 & B-7.1.3 in Appendix B-7 illustrate the existing acreage open and closed to motorized travel off designated routes both within active allotments (currently grazed) and vacant allotments (possibly grazed in the future).

The potential effect of dispersed camping on grazing and grazing operations from dispersed camping is expected to be mixed. Because cattle tend to avoid occupied campsites, and because dispersed campsites have a higher probability of occurring within primary range (typically valley bottoms in near proximity to a water source), increased dispersed camping may improve cattle distribution within any given pasture (there would not be any anticipated impact on sheep allotments). However, as preferred dispersed campsites become fully occupied it is anticipated that there would be an increase in the occupancy of less desirable sites including within water lots (areas designed to be an access for livestock to water). Occupancy of dispersed campsites within water lots renders the range improvement nonfunctional having a negative effect on grazing and/or grazing operations. This type of impact would be most pronounced where stock water is a limiting resource, and becomes of less importance as water becomes more available and abundant.

Alternatives 2 and 3

Under Alternatives 2 and 3, an additional 63,265 acres of the six active grazing allotments on the Deschutes National Forest and an additional 438,468 acres of the sixty six active grazing allotments on the Ochoco National Forest (including the Crooked River National Grassland) that are currently open to motorized access off designated routes would be closed off designated routes. On the vacant grazing allotments, 19 on the Deschutes National Forest and six on the Ochoco National Forest and Grassland, an additional 231,169 acres and 5,302 acres respectively, that are currently open to motorized travel off designated routes would be closed to travel off designated routes. A comparison will not be conducted for grazing allotments in a closed status because the potential to impact grazing and/or grazing operations within closed allotments is very low. The table below summarizes the total acreage open and closed to motorized travel off designated routes by allotment status and Forest.

Table 3-134: Summary of motorized access for off designated routes (approximate acres) by Allotment Status and Forest under Alternatives 2 and 3

ALLOTMENT STATUS	FOREST	NUMBER OF ALLOTMENTS	CLOSED TO MOTORIZED TRAVEL OFF DESIGNED ROUTES	OPEN TO MOTORIZED TRAVEL OFF DESIGNED ROUTES
Active	Deschutes	6	168,000	400
	Ochoco	66	637,000	20
	Combined	**72**	**805,000**	**420**
Vacant	Deschutes	19	395,000	0
	Ochoco	6	7,800	0
	Combined	**25**	**402,800**	**0**

Tables B-7.1.6 & B-7.1.7 in Appendix B-7 (Range) present motorized access off designated routes (acres) information in greater detail for both forests respectively under Alternatives 2 and 3.

Observations of past damage to range improvements and incidents of livestock harassment injury and mortality indicates that acreage open to motorized access off designated routes may be used as an index related to the amount of damage (both intentional and accidental) rendered upon range improvements as well as the amount of harassment and killing of livestock by general members of the public. Under Alternatives 2 and 3, the majority of the acreage with the 72 active grazing allotments and all of the acreage within the 25 vacant grazing allotments on both Forests would be closed to motorized travel off designated routes (see Tables B-7.1.6 and B-7.1.7 in Appendix B-7). It is expected that this would result in a considerable reduction in the amount of damage of range improvements (both intentional and accidental) as well as a proportionate reduction in the amount and degree of harassment and killing of permitted domestic livestock short through long term.

Alternative 2

Under Alternative 2 an additional 422,000 acres would be closed to motorized access for dispersed camping on the six active grazing allotments on the Deschutes National Forest and the sixty six active grazing allotments on the Ochoco National Forest and Grassland. Of the remaining acreage on active grazing allotments, 56,700 have special provisions limiting where dispersed camping may occur. Also under this alternative approximately 162,000 acres would be closed to motorized access for dispersed camping on the 19 vacant grazing allotments on the Deschutes National Forest and the six vacant grazing allotments on the Ochoco National Forest (including the Crooked River National Grassland). Of the remaining acreage on vacant grazing allotments, approximately 24,400 has special provisions limiting where dispersed camping may occur. As a result, livestock dispersal associated with occupancy of dispersed camp sites may be reduced potentially resulting in livestock meeting utilization standards in portions of primary range where they have not previously, short through long term.

The table below summarizes acreage open and closed to motorized access for dispersed camping as well as those areas open but limited by special provision. These are listed by allotment status and forest.

Table 3-135: Summary of motorized access for dispersed camping (approximate acres) by Allotment Status and Forest under Alternative 2

ALLOTMENT STATUS	FOREST	NUMBER OF ALLOTMENTS	CLOSED TO MOTORIZED ACCESS FOR DISPERSED CAMPING	OPEN TO MOTORIZED ACCESS FOR DISPERSED CAMPING	DESIGNATED SITES and SPECIAL PROVISIONS FOR DISPERSED CAMPING
Active	Deschutes	6	105,000	39,000	7,700
	Ochoco	66	524,000	65,000	49,000
	Combined	**72**	**629,000**	**104,000**	**56,700**
Vacant	Deschutes	19	266,000	105,000	24,000
	Ochoco	6	6,200	1,200	400
	Combined	**25**	**272,200**	**106,200**	**24,400**

Tables B-7.1.8 & B-7.1.9 in Appendix B-7 (Range) present motorized access for dispersed camping (acres) information in greater detail for both forests respectively for Alternative 2.

Cumulatively, the reduction of damage to range improvements and of harassment and killing of livestock in combination with past, present and future wildlife, fuels, silvicultural and watershed enhancement vegetation management projects is expected to result in overall improved distribution of domestic livestock and a net positive impact on grazing and grazing operations. This is expected because these projects tend to decrease obstacles to livestock travel but increase forage quantity and improve forage quality particularly in the uplands.

Alternative 3

Alternative 3 is the same as Alternative 2 except it limits all motorized access for dispersed camping that was open in Alternative 2 to limited by special provision in Alternative 3. This would be expected to further slightly reduce the dispersal of cattle (on active cattle allotments) associated with occupied dispersed campsites short through long term.

Table 3-136: Summary of motorized access for dispersed camping (approximate acres) by Allotment Status and Forest under Alternative 3

ALLOTMENT STATUS	FOREST	NUMBER OF ALLOTMENTS	CLOSED TO MOTORIZED ACCESS FOR DISPERSED CAMPING	OPEN TO MOTORIZED ACCESS FOR DISPERSED CAMPING	DESIGNATED SITES and SPECIAL PROVISIONS FOR DISPERSED CAMPING
Active	Deschutes	6	105,000	0	47,000
	Ochoco	66	524,000	0	114,000
	Combined	**72**	**629,000**	**0**	**161,000**
Vacant	Deschutes	19	266,000	0	129,000
	Ochoco	6	6,200	0	1,600
	Combined	**25**	**272,200**	**0**	**130,600**

Cumulatively the effects of Alternative 3 would be indistinguishable from Alternative 2.

Fisheries

Executive Summary

This section summarizes the analysis of the effects from implementing the actions proposed in this EIS on fish populations, critical habitat and habitat for threatened bull trout (*Salvelinus confluentus*), steelhead, and sensitive redband trout (*Oncorhynchus mykiss*).

Potential positive effects to fisheries from implementation of either action alternative could result indirectly from decreases in erosion and bank instability, and increases in vegetative cover (shade).

In Alternative 2, the potential is reduced for turbidity, fine sediment bed load, and increases in stream temperature from the no action alternative, and would have a beneficial effect on these resources at the localized scale, especially in relation to motorized access for dispersed camping. These beneficial effects to habitats are anticipated, although not specifically quantifiable without more site-specific data related to future uses and recovery of these areas. Overall there would be a reduction in acres within 100' of waterbodies that would reduce motorized access off of designated routes of almost 16,000 acres on the Deschutes and 40,000 acres on the Ochoco.

Alternative 3 would provide a further beneficial effect by limiting motorized access across both forests for dispersed camping to only to existing, designated, or defined sites with a 30' setback from streams, wetlands, or waterbodies.

Affected Environment

Watersheds are natural divisions of the landscape and the basic functioning unit of the hydrologic system. Watersheds are hierarchical - - smaller ones nested within larger ones. For the purpose of analyzing and summarizing aquatic and vegetative data a hierarchy of watersheds and watershed boundaries was developed by the region using U.S. Geological Survey (USGS) protocols. Identification of these watersheds follows the USGS numeric Hydrologic Unit Coding (HUC) system, and are referred to as 'HUC's'.

There are eleven 4th field HUC's across the two Forests and Grassland. Within these 4th field HUC's there are fifty six 5th field HUC's that have potential aquatic species/issues for dispersed camping out of a total of sixty four 5th field HUC's (10 have no surface water associated with them). On the Deschutes the 4th fields are the Upper Deschutes and Little Deschutes, Summer Lake, and Williamson. The Ochoco and the Grassland have the Lower Deschutes, South Fork Crooked, Lower Crooked, Upper Crooked, Lower John Day, Upper John Day, and Trout.

A more detailed description of the existing condition of the 4th Field subbasins within the analysis area are included in Appendix B-1 – Fisheries, Current Condition of 4th Field HUC's. The watersheds within which the conditions described above are of greatest potential concern are:

Upper Deschutes 4th Field HUC
- Crane Prairie 5th Field HUC
- Wickiup 5th Field HUC
- Squaw Creek 5th Field HUC
- Upper Metolius River 5th Field HUC

Lower Crooked 4th Field HUC
- McKay Creek 5th Field HUC

On the Deschutes National Forest there are 726 miles of stream that are fish bearing. In addition there are over 400 miles of non-fish bearing streams. The Deschutes is generally characterized by streams with flow regimes that are spring fed with consistent flows and result in stable systems. There are some systems that are flashy, snow melt dominated systems, but these are relatively few in number. In most of these systems bank stability is high due to the stable nature of the flow and resulting excellent vegetative growth within the near bank riparian areas.

There are over 300 lakes on the Deschutes National Forest with only about 30 of those lakes accessible by vehicle. While most of these 30 lakes allow dispersed camping adjacent to them, there are many that do not. These include East, Paulina, Little Cultus, Cultus, Deer, Hosmer, Lava, Little Lava, Elk, Todd, North Twin, South Twin, Odell, Suttle, Three Creek, and Jack lakes.

On the Ochoco National Forest, including the Crooked River National Grassland, there are 825 miles of fish bearing streams and over 1800 miles of non-fish bearing streams. Most all of these stream systems are snow melt dominated systems with high spring flows followed by very low summer flows. Numerous systems have high elevation meadows (with wide riparian areas) that link narrower streams with riparian areas that are dominated by forests. These systems generally have higher base flows than most of the other systems within the Ochoco National Forest and the Grassland.

Lakes and reservoirs on the Ochoco National Forest and Grassland are limited to four major lakes and reservoirs: Haystack Reservoir, Walton Lake, Antelope Reservoir, and Lake Billy Chinook. However, motorized access for dispersed camping does not exist on any of these bodies of water.

Fish species vary widely across both forests, although the number of different native species is relatively low. Of most importance is the presence of bull trout in the Metolius, Whychus, and Odell systems, and steelhead in Trout Creek, within most all tributaries to the John Day off the north slopes of the Ochoco's, and the reintroduction of steelhead within the McKay Creek, Whychus, and Metolius river systems. Native redband trout are widely distributed across the Ochoco National Forest and in many locations within the Upper Deschutes subbasin. Redband trout have likely been extirpated from the Little Deschutes fourth field subbasin.

Brook trout are the most widely distributed introduced species and occupy many miles of streams and acres of lakes throughout the Deschutes basin on both Forests and the Grassland. Brown trout, while also introduced, are not as widely distributed as brook trout. Strong populations are present in the Deschutes River, Wickiup and Crane Prairie Reservoirs, and parts of the Little Deschutes River.

Numerous other fish species, from bass to bullheads, have been introduced across both Forests, although the Deschutes has the most introduced species, due mostly to the number of lakes and reservoirs.

Motorized travel off designated routes (forest wide) and to dispersed sites can create a number of conditions that have the potential to affect stream channels and riparian habitat thereby resulting in effects to fisheries habitats. Included in these conditions is increased erosion from riparian areas as a result of motorized travel off of designated routes and access to dispersed sites that are located close to streams, wetlands, or waterbodies. Erosion from these access routes can be channeled directly to streams and lakes as a consequence of the slope of the surrounding land and the proximity of the access route to these riparian areas. These routes can be highly compacted areas that have reduced infiltration rates so the water is usually concentrated in these areas, has increased velocities and erodes these access routes. This surface sediment can be routed to nearby streams or water bodies. This increase in fine sediment has the potential to reduce spawning success and rearing habitat for fish and other aquatic organisms through infilling of spawning gravels and pools.

In addition to the potential to increase sediment, these routes also have the potential to reduce the amount of vegetation that surrounds and parallels streams or other riparian areas. Vegetation in these areas contributes to bank stability, shade, and large woody debris in streams. Access routes that parallel streams or that have direct access to stream banks have the greatest potential for decreasing these important vegetation components.

Special Fisheries Habitats and Species

Essential Fish Habitat
Magnuson-Stevens Fishery Conservation and Management Act Public Law 94-265

The Pacific Fishery Management Council designated Essential Fish Habitat for chinook salmon on September 27, 2000. Essential Fish Habitat for Spring Chinook has been designated across both Forests and the Grassland. This designation includes current and some historic habitat in the Deschutes Basin. Historical habitat above Pelton Round Butte Dam is also included. For the Ochoco National Forest, Essential Fish Habitat is not included above Ochoco Reservoir Dam or above Bowman Dam, but does include habitat on the north facing slopes of the Ochoco National Forest. On the Deschutes NF it includes the Deschutes River to Big Falls, Whychus Creek, and the Metolius River watersheds

Threatened and Endangered Species and Critical Habitat

Biological Analyses/Evaluations have been prepared to document possible effects of proposed activities on threatened and endangered species in the project area. There are no endangered aquatic species known or suspected to occur on the two Forests and Grassland. Threatened aquatic species that are known or suspected to occur on the two Forests and Grassland include bull trout (*Salvelinus confluentus*) and its critical habitat (areas occupied by bull trout on private land), and mid-Columbia River steelhead trout (*Oncorhynchus mykiss*) along with its critical habitat (all areas occupied by steelhead on federal land).

Stocks of summer steelhead currently occur across the north and east slopes of the Ochoco NF, in McKay Creek (Ochoco NF) and the Lower Crooked River on the Grassland, along with Whychus Creek and the lower Deschutes River on the Deschutes NF. Bull trout occur in lower Whychus Creek, the lower Deschutes and Crooked Rivers, the Metolius watersheds, and Odell Lake and Odell Creek 5th field watersheds.

Sensitive Species

Sensitive species are established under the Endangered Species Act of 1973 as amended. There are four sensitive species that are evaluated in this document. They are the Malhuer mottled sculpin (*Cottus bairdi),*

West-slope cutthroat trout (*Oncorhynchus clarki lewisi)*, Mid-Columbia River spring chinook salmon (*Oncorhynchus tshawytscha)*, and Redband trout (*Oncorhynchus mykiss*). Three species, the Malhuer mottled sculpin, West-slope cutthroat trout, and Mid-Columbia River spring chinook salmon would have No Impact because there are no known populations in the project area. One Sensitive Species, the Redband Trout, is the only salmonid that is known to occur within the project area and the effects to this species and habitat have been evaluated in detail.

Analysis of Environmental Effects

The following discussion includes the possible effects of both motorized access off designated routes and motorized access for dispersed camping. Studies across the United States on the effects of both two and four wheeled off-highway vehicles (OHV's) show consistent findings. This brief review is not meant to be exhaustive of the literature that has been published, but is meant to show the general conclusions that are almost universally agreed upon within the literature.

In a review of literature, Manning (1979) showed that recreation can affect vegetation in a few different ways, which included trampling and compaction of the soil. Numerous studies showed that the primary effects of OHV's on soils include surface disruption and compaction which can lead to increases in runoff and erosion. Foltz (2006) found that in all cases (low, medium, and high disturbance) for ATV trails that sediment movement and loss would be expected to increase due to ATV traffic over undisturbed areas. Others have found similar results with effects including gullying, compaction and increased soils exposure, along with lower vegetative species diversity. Similarly, Webb (1978) studied effects on six soil types and found increases in erosion, decreased surface strength in sandy and loamy soils, resulting in impediments to revegetation. In clay soils, surface strength increased which may increase runoff. This was also noted by Wilshire et al. (1978) in a study of over 400 sites in seven states and included increased density. This increase in density resulted in decreased infiltration, increased runoff, increased erosion and sediment yield and prevented revegetation. Numerous other studies found similar effects of reduced vegetation, reduced infiltration, increased runoff, and increased erosion as a result of OHV use in areas.

Vegetative buffer strips along streams are known to reduce sediment yield to streams as the sediment is trapped by the vegetation and duff layers. While the general rule is that the wider the vegetative strip the better, it appears to be mostly correlated with slope (steeper slopes require larger/wider vegetative buffers). Most dispersed sites are located on flat terrain (0 to 5% slope) on terraces and minimum vegetative buffers would allow for sediment filtering before runoff into water bodies. Rashin et al. (2006) found that a 10 meter (32.8 ft.) setback of felling and yarding activities prevented sediment delivery to streams from about 95 percent of harvest related erosion features, and said a wider setback may be advisable on portions of units where steep inner gorges extend beyond 10 meters. And Haupt and Kidd (1965) found that 9 meter (29.5 feet) buffer strips in central Idaho were sufficient to remove sediment. Heade (1990) found buffer strips ranging between 7 and 25 meters (23 and 82 feet) were needed on 23 to 25 percent slopes in ponderosa pine.

General Effects of Motorized Access on Fisheries

Effects to fisheries resources and populations of native and non-native resident and anadromous fish, and of Threatened and Endangered listed species across both Forests could come from changes in any of the following conditions:

- Vegetation – loss of riparian vegetation can result in loss of shade and increase in stream temperatures.

- Bank stability – unstable banks can be susceptible to erosion and result in an increase in fine sediment input to fisheries habitat.
- Sediment – increased erosion from upland and riparian areas due to motorized use can result in an increase in sediment to streams.

There are generally only indirect effects to fish populations from motorized access based on where motorized access to streams, lakes, or the banks of wetlands is available. Important habitat components of pools and large woody debris are unlikely to be directly or indirectly affected in a measurable way by this type of access.

Indirectly, water temperature, rearing habitat, and spawning habitat can be affected by motorized access off designated routes and motorized access for dispersed camping. However, due to the small localized nature of the project sites (dispersed sites and "cross country" roads and trails) across the landscape it is doubtful that changes could be measured at the local drainage level that are directly attributed to motorized access. These potential effects are a result of effects from motorized access that include soil compaction and denuding of the vegetation which could lead to a reduction in shade and bank stability and an increase in soil erosion. These conditions in turn could lead to increases in stream or lake turbidity, embeddedness of spawning gravels and rearing areas, along with localized increases in water temperatures on any sites where vegetation directly shades streams

The following sections evaluate more specifically the potential effects of each of the alternative on fisheries habitats and populations. These effects are based on the consideration of the amount of area where motorized access off designated routes would be allowed and the amount of area and conditions under which motorized access for dispersed camping would be allowed adjacent to riparian areas. These factors can affect the amount of area that could result in those conditions described above that could indirectly affect fisheries. The following evaluation describes data concerning known dispersed sites as a proxy for the kind of impacts that could be anticipated across the forest under each of the alternatives.

Alternative 1

The tables below include data for both motorized travel off of designated routes and motorized travel for dispersed camping. There are about 439 open dispersed sites adjacent to Forest and Grassland waterbodies in the current forest data base.[82]

[82] Estimates of acres and lineal distance of impacted bank are from the assumptions described in the Assumptions and Methodologies section. Both Forests and the Grassland have GIS layers that have mapped some dispersed camp sites. In some cases these have been updated recently (1-5 years old) while in others the mapped sites are as many as 20 years old. On both Forests the GIS layer is incomplete and does not include all existing dispersed sites, but it does provide a starting point for discussion on proximity and effects. It was assumed for this analysis that any dispersed site that is mapped within 100' of a waterbody is directly adjacent to that waterbody or bank of the waterbody. While this may over estimate the actual number of dispersed sites adjacent to waterbodies, without more current specific information about actual site locations, it was determined that this method of estimation would provide a reasonable basis for projecting effects.

Table 3-137: Numbers, Acres, and Lineal Feet of Dispersed Sites Adjacent to Waterbodies by Forest

	Number of dispersed sites adjacent to stream channels, lakes, wetlands		Acres of dispersed sites adjacent to stream channels, lakes, wetlands		Lineal distance of potentially impacted bank in feet	
	Deschutes	Och/CRNG	Deschutes	Och/CRNG	Deschutes	Och/CRNG
Alternative 1 Total	230	209	39	36	11,500	10,450
T&E only Watersheds	108	27	18	5	5,400	1,350
Resident Fish only Watersheds	122	182	21	31	6,100	9,100

Table 3-138: Acres Open to Travel off of Designated Routes within 100 feet of Waterbodies

	Acres Open to Travel off Designated Routes – within 100 feet of stream channels, lakes, and wetlands	
	Deschutes	Ochoco/CRNG
Alternative 1 Total	15,962	39,888
T&E only Watersheds	5,688	6,656
Resident Fish only Watersheds	10,274	33,232

Table 3-139: Acres Open in Riparian Reserves or RHCA's for Dispersed Camping

	Acres Open in Riparian Reserves or RHCA's for dispersed camping	
Alternative 1	Deschutes	Ochoco
Total	**75,741**	**62,062**

Larger "impacted" sites/areas as identified in the current condition 4th field HUC sections are as follows (best professional estimate of size):

Table 3-140

Area/Site	Number of Acres open to Motorized Access for Dispersed Camping
Deschute NF	
Crane Prairie Reservoir	60
Wickiup Reservoir	910
Meadow Lakes	20
Metolius/Jack Creek/Canyon Creek	9
Ochoco NF	
Whychus Creek crossing area	20
McKay Creek	9,000

As seen in the previous tables, of the sample sites there are potentially over 2 miles of lineal bank impacted by motorized access for dispersed camping on both the Deschutes and Ochoco National Forests. This accounts for approximately 39 acres and 36 acres respectively on the two Forests that are currently used as

dispersed sites adjacent to stream or other waterbodies/wetlands. There are over 75,000 acres within riparian areas on the Deschutes open to motorized access for dispersed camping and another 62,000 acres on the Ochoco. In addition, there are almost 16,000 acres of area open on the Deschutes to travel off designated routes within 100 feet of streams, waterbodies, or wetlands, and almost 40,000 acres on the Ochoco.

Effects to fisheries resources in Alternative 1 include the following:

- Increases in erosion and sediment yield to streams from increased use over time of dispersed sites and increases in the number of dispersed sites (see Recreation Section) directly adjacent to streams, lakes, and wetland banks (no 30' setback)
    - This would be generally true across both forests and the grassland, however it should be noted that in areas where use is deemed "excessive" management actions will be taken to reduce the effects over time.
- Increases in the number of access routes to dispersed sites and associated increase in erosion from these areas as a result of soil compaction and displacement
    - Assuming that there is some increase over time for the use and creation of new dispersed sites and routes (see the Recreation section in this EIS). Erosion from these routes is often directed through the dispersed site and into the adjacent water body.
- Increased turbidity from sediment entering water bodies
- Decreased bank stability from continued and expanded use along water bodies
- Decreased vegetation and associated shade adjacent to water bodies

Potential effects to fisheries resources and populations include localized increases in turbidity, decreases in vegetation and associated shade or bank stability, and potential increases in sediment loads in stream systems.

Turbidity

Turbidity increases would only occur during runoff events during the year, but would continue to happen every year. These runoff events would be during spring snow melt, summer thunder showers, or fall/early winter rains. Turbidity increases could cause disruption in feeding and rearing activities for salmonids depending on the overall quantity and duration. Overall, it is difficult to measure these effects across the project area. There may be some localized areas and drainages directly adjacent to dispersed sites and/or hydrologically connected to motorized access routes that could show effects, however these are not currently measured or monitored.

Vegetation

Vegetation decreases, as seen in the literature review, would continue to occur as dispersed sites expand in number and area impacted increases. The main effect would be less filtering of sediment as the vegetative strip between the motorized access and the water body decreases in width, and potentially a reduction in bank stability as root holding capacity is decreased. This would indirectly lead to increases in turbidity (see effects above) and potentially increases in fine sediment bedload (see effects below) which could impact spawning and rearing success in the long term directly adjacent to these sites.

The decrease in vegetation could also impact some small localized areas relative to shade. If this occurs in backwater areas there could be an increase in water temperature such that aquatic species, including salmonids, may be affected (move out of the area). These potential increases in water temperature would be during the hottest months of the year (July and August). The temperature would also only be increased in those areas with dispersed sites that are not on the north side of the waterbody as the loss of vegetation in those areas could lead to increase solar inputs to the water. If this decrease in shade is associated with

streams/rivers, then effects would be immeasurable as the small area and flow of water would negate any measurable increase in temperature. Overall it is thought for the purposes of this analysis that any increases in stream temperatures would be immeasurable due to the type of vegetation impacted, the size of sites, and the widely spaced arrangement of the sites. See the Water Quality/303d listed stream segments discussion elsewhere in this EIS for additional information.

Sediment

Bank stability adjacent to dispersed sites and in areas of motorized use off of designated routes would also likely continue to decrease as these sites and areas increase in size and number. This instability could affect fisheries resources by increasing bedload sediment that could impact spawning and rearing success by decreased intersticial spaces in the gravel. Assuming that this erosion and depositional process continues to occur, the effects would be long term in the areas affected.

The six main areas that have been identified earlier in this Chapter as larger "impacted" areas would be the greatest areas of concern and these have been identified by professional knowledge of the ground impacts through direct observations of the Fisheries Biologist. Other sites could be similar. Water bodies, fish habitat and populations directly adjacent to these areas likely show some level of effect from increased sediment. Although it has not been quantified, it has been noted visually with bank tramping, denuding of vegetated surfaces, rill and gully erosion, and resulting increase in sediment loads. This may decrease spawning success and may decrease hiding cover for juvenile salmonids and other aquatic species, as interstices in the gravel are filled. Of these six areas, the McKay Creek watershed on the Ochoco NF has a recent closure to travel off of designated routes. This closure is similar to the implementation of Alternatives 2 and 3. The other five areas will continue to be open with no restrictions on travel off designated routes or restrictions on how close dispersed camping can occur to waterbodies.

Essential Fish Habitat

Essential Fish Habitat for Spring Chinook has been designated across both Forests and the Grassland. Alternative 1 would result in continued increases in turbidity, increases in fine sediment and potentially some decreases in shading of localized areas from motorized access for dispersed camping and motorized access off of designated routes. However these effects are difficult to measure due to the scattered nature of the motorized access and erosional areas, and the indirect nature of the effects of changes in vegetation conditions, soil compaction and erosion on fisheries and essential habitat conditions. Therefore this alternative would have no adverse affect to Essential Fish Habitat.

Threatened, Endangered and Sensitive Species and Critical Habitat

Threatened, Endangered and Sensitive species habitat and populations are located across both Forests and the Grassland. Sensitive species of redband trout are located almost throughout the two Forests and Grassland. Bull trout habitat and populations are located in the Odell Lake and Odell Creek 5th field watersheds, the Metolius watersheds, Lower Whychus Creek and Lower Crooked River 5th field watersheds. Steelhead are located in all watersheds along the north slope of the Ochoco NF, the watersheds that flow easterly into the South Fork of the John Day below the South Fork Falls, McKay Creek, Whychus Creek and lower Deschutes River and Crooked River watersheds.

The Matrix of Pathways and Indicators (as developed by National Marine Fisheries Service and U.S. Fish and wildlife Service), which is designed to summarize important environmental parameters and levels of condition (for habitat for ESA listed species) includes a large variety of habitat attributes that could be

affected by implementation of projects. In this project, only turbidity, shade/water temperature, and fine sediment could be affected. Effects to these species are the same as outlined above. While it will be difficult to measure specific effects due to the scattered nature of the dispersed sites and erosional areas, there will be continued increases in turbidity, increases in fine sediment and potentially some decreases in shading of localized areas. For bull trout and steelhead this alternative will have a May Affect, Not Likely to Adversely Affect, and for redband will have a May Impact Individuals or Habitat but would not lead to a trend towards listing.

Critical habitat for steelhead and bull trout has been designated across both Forests and the Grassland. Steelhead critical habitat has been designated in the same areas as the current distribution of known steelhead populations. Effects to steelhead critical habitat are the same as those for steelhead as outlined above. Bull trout critical habitat has been designated only on private lands adjacent to and within National Forest Boundaries. Effects to bull trout critical habitat are not measurable due to the scattered nature of motorized access for dispersed camping and motorized access off designated routes and the designation of critical habitat for bull trout only on private lands that are adjacent to National Forest system lands. The likelihood of a dispersed site or "cross-country" travel route being located directly adjacent to a private land segment in bull trout habitat is very low.

Alternatives 2 and 3

The greatest beneficial effect of Alternatives 2 and 3 is the reduced number of acres available to motorized access off designated routes within 100 feet of streams, lakes, and waterbodies when compared with Alternative 1. Neither Alternatives 2 nor 3 would have any acres available for motorized access off designated routes within 100' of a stream, lake or waterbody.

In the tables below, there are estimated to be 421 open dispersed sites adjacent to waterbodies on the Deschutes National Forest, and 202 adjacent to waterbodies on the Ochoco National Forest and Grassland waterbodies. Estimates of acres and lineal distance of impacted bank are from the assumptions stated previously in this Fisheries section. Both Forests and the Grassland have GIS layers that have mapped dispersed sites. In some cases these have been updated recently (1-5 years old) while in others the mapped sites are as many as 20 years old. On both Forests it is known that the GIS layer is incomplete and most likely does not include all existing dispersed sites, but it does provide a starting point for discussion on proximity and effects. It was assumed for this analysis that any dispersed site that is mapped within 100' of a waterbody is directly adjacent to that waterbody or bank of the waterbody. While this may over estimate the actual number of dispersed sites adjacent to waterbodies, without complete information it was determined that this method of estimation would provide a reasonable way of comparing effects. It was also assumed that motorized access for dispersed camping would be limited to access only existing, designated or defined campsites no closer than 30' of a waterbody.

There is no measurable distinction between Alternatives 2 and 3 for fisheries resources because any changes in management outside of the 300' riparian special provision areas along routes will not result in changes to shade, large wood debris, or sediment inputs along water bodies.

As an example of the likely benefits, the inventoried dispersed sites are described below.

Table 3-141: Acres Open to Motorized Access off Designated Routes in Riparian Areas

	Acres Open to Motorized Travel off Designated Routes – within 100' of stream channels, lakes, and wetlands			
	Alternative 1		Alternatives 2 & 3	
	DES	OCH	DES	OCH
T&E Watersheds	5,688	6,656	0	0
Resident Fish Watersheds	10,274	33,232	0	0
Totals	**15,962**	**39,888**	**0**	**0**

Table 3-142.: Acres Open in Riparian Reserves or RHCA's to Motorized Access for Dispersed Camping

	Acres Open in Riparian Reserves or RHCA's to Motorized Access for Dispersed Camping Under Special Provisions (distance measured from edge of waterbody)	
	Alternative 1	Alternatives 2 and 3
Deschutes	75,000	15,109
Ochoco	62,000	20,740
Totals	137,000	35,849

Table 3-143. Numbers and Acres of Dispersed Sites Adjacent to Waterbodies

	Number of dispersed sites adjacent to stream channels, lakes, wetlands		Acres of dispersed sites adjacent to stream channels, lakes, wetlands		Lineal distance of potentially impacted bank in feet	
	Deschutes	Och/CRNG	Deschutes	Och/CRNG	Deschutes	Och/CRNG
Alternative 2 and 3 Total	421	209	72	34	10,525	5,050
T&E only Watersheds	245	27	42	5	6,125	675
Resident Fish only Watersheds	176	182	30	29	4,400	4,375

Listed below are the larger "impacted" sites/areas after implementation (best estimate of size and associated assumptions) that would allow for access for dispersed camping as a result of the rule.

Table 3-144. Estimate of Larger Impacted Areas after Implementation

Area/Site	Estimate of Acres
Deschute NF	
Crane Prairie Reservoir	30 acres – assume that 50% of impacted area is from motorized access off designated routes
Wickiup Reservoir	450 acres - assume that 50% of impacted area is from motorized access off designated routes
Meadow Lakes	10 acres – combination of user created trails to be closed and moving of motorized access for dispersed camping back from waters edge
Metolius/Jack Creek/Canyon Creek	3 acres – decrease in motorized access off designated routes
Ochoco NF	

Whychus Creek crossing area	4 acres – majority of the impact is from motorized access off designated routes
McKay Creek	200 acres – area closure for motorized access off designated routes and restrictions to only designated sites for dispersed camping.

Table 3-143 represents the number of acres of inventoried dispersed sites adjacent to waterbodies in Alternatives 2 & 3, which is an increase over Alternative 1 by 191 dispersed sites on the Deschutes National Forest. This is mainly because of temporary closures due to recent fires that would be eventually lifted and the area opened to dispersed camping. Areas that are closed to motorized access for dispersed camping under a temporary public use restriction as a result of wildfire, would be opened for motorized access for dispersed camping when the Forest Service has determined conditions were sufficiently recovered to no longer warrant the closure.

Overall there is a decrease in the lineal feet of bank impacted from motorized access for dispersed camping on both Forests. Acres impacted by motorized access for dispersed camping would be reduced across both Forests compared to Alternative 1. Acres that are open to motorized access for dispersed camping within Riparian Reserves or Riparian Habitat Conservation Areas are reduced from 75,000 acres on the Deschutes to 15,000 acres, and on the Ochoco from 62,000 acres to 20,000 acres. This type of reduction is also seen through the larger "impacted areas" listed above where reduction in acres affected has been approximated. The following beneficial effects would be expected:

- Decreases in erosion due to motorized access for dispersed camping directly adjacent to streams, wetlands and waterbodies (30' setback) – even with the "increase" in the number of dispersed sites as a result of temporary fire closure openings, because of the 30' setback.
- Decreased turbidity from sediment entering water bodies
- Increased bank stability from decreased motorized use
- Increased vegetation and associated shade adjacent to water bodies

There are no anticipated adverse effects to bull trout or steelhead populations, stream habitat or critical habitat from either Alternative's 2 or 3. Overall there would be a benefit to both Threatened and Endangered fish and resident fisheries habitat, critical habitat and populations as a result of this new rule because of limits on where motorized vehicle access can occur. Effects to fisheries resources and populations include localized decreases in turbidity, increases in vegetation and associated shade or bank stability, and potential decreases in sediment loads in stream systems.

Turbidity

Turbidity decreases would only occur during runoff events during the year, but would continue to happen every year. These runoff events would occur during spring snow melt, summer thunder showers, or fall/early winter rains. However, the turbidity levels as a result of motorized access for dispersed camping and motorized travel off of designated routes should decrease as a result of a decrease in areas that can be accessed with a motorized vehicle adjacent to streams and waterbodies. Turbidity levels would be decreased because vegetation would re-establish on currently denuded areas, which would in turn filter sediment that would previously have been entering those waterbodies. Vegetation along banks would increase in the area of the 30' setback for motorized use. As seen in Table 3-137 above, the lineal feet of bank disturbance is expected to decrease across both Forests and the Grassland. This would increase bank stability and decrease the amount of sediment/turbidity that would reach the stream system during rain or snow melt events. Turbidity decreases from this action would be difficult to measure due to the scattered nature of the ground disturbance and the timing of run-off events but any improvement would allow for less disruption in feeding and rearing activities for salmonids depending on the overall quantity and duration.

Overall, it is difficult to measure these effects across the project area. There may be some localized areas directly adjacent to dispersed sites that could see decreases in turbidity due to decreased motorized use directly adjacent to the banks of streams, lakes, or wetlands and increased vegetative cover however these are not currently measured or monitored.

Vegetation

Vegetation increases associated with dispersed sites moved back from banks directly adjacent to waterbodies and from decreased motorized travel off of designated routes would result in increased filtering of sediment as the vegetative strip between the motorized access and the water body increases in width, and potentially increases bank stability as root holding capacity is increased. This would indirectly lead to decreases in turbidity (see effects above) and to potential decreases in fine sediment bedload (see effects below) which could improve spawning and rearing success in the long term directly adjacent to these sites.

The increase in vegetation could also impact some small localized areas relative to shade. If this occurs in backwater areas there could be a decrease in water temperature such that aquatic species, including salmonids, may be affected. These potential decreases in water temperature would be during the hottest months of the year (July and August). The temperature would also only be decreased in those areas with dispersed sites that are not located on the north side of the waterbody as the increase in vegetation in those areas could lead to decrease solar inputs to the water. If this increase in shade is associated with streams/rivers, then effects would be immeasurable as the small area and flow of water would negate any measurable decrease in temperature. Overall, although Alternatives 2 and 3 would provide for some potential benefits to bank vegetation by the removal of motorized access, any indirect decreases in stream temperatures would likely be immeasurable due to the type of vegetation impacted, the size of sites, and the widely spaced arrangement of the sites. See the Water Quality/303d listed stream segments discussion elsewhere in this document for additional information.

These changes would probably not occur in the short term (0-5 years) as vegetation would be slow to recover. However in the mid-term (5-10 years) and long term (10+ years) benefits from recovered vegetation would begin to be manifested.

Sediment

Bank stability adjacent to dispersed sites and in areas of motorized use off of designated routes would also likely continue to increase as these sites and areas decrease in size. This stability could affect fisheries resources by decreasing bedload sediment that could impact spawning and rearing success by decreasing intersticial spaces in the gravel. Assuming that this erosion and depositional process decreases in size and scope, the effects of reduction in fine sediment input to fish habitat and resulting increase in overall gravel size and benefit to spawning success would be long term in the areas affected.

The six main areas that have been identified earlier in this report as “large impacted” areas would be the largest areas to benefit from the implementation of either action alternative. Water bodies, fish habitat and populations directly adjacent or hydrologically connected to these areas would likely show some level of effect from decreased sediment. Although it has not been quantified it has been noted visually that there is bank tramping, denuding of vegetated surfaces, rill and gully erosion, and resulting increase in sediment loads in these areas. Recovery times for reduction in sediment are tied to recovery of the vegetative component (see vegetation section above). In the short term (0-5 years) there would likely not be much change as denuded areas are slow to recover without active management. In the mid-term to long term there would be reduced sediment from motorized use of dispersed camping areas and from the decrease in

motorized use off of designated routes. This is especially true in the larger "impacted" areas where much of the current impact is a result of use off of designated routes.

This long term recovery in areas adjacent to streams (McKay, Whychus, and Metolius/Jack/Canyon) may increase spawning success and may increase hiding cover for juvenile salmonids and other aquatic species as bedload fine sediment is reduced as a result of limiting motorized access across the forest.

Essential Fish Habitat

Essential Fish Habitat for Spring Chinook has been designated across both Forests and the Grassland. While it would be difficult to measure specific effects due to the scattered nature of the dispersed sites and erosional areas, there would be beneficial effects from decreased localized turbidity and fine sediment, and increases in vegetative cover and potentially shade as a result of this action. As a result of this analysis, there has been a finding of No Adverse Effect to Essential Fish Habitat for Spring Chinook in accordance with the Magnuson-Stevens Fishery Conservation and Management Act .

Threatened, Endangered and Sensitive Species, and Critical Habitat

Threatened, Endangered and Sensitive species habitat and populations are located across both Forests and the Grassland. Sensitive species of redband trout are located almost throughout the two Forests and Grassland. Bull trout habitat and populations are located in the Odell Lake and Odell Creek watersheds, the Metolius watersheds, Lower Whychus Creek and Lower Crooked River watersheds. Steelhead are located in all watersheds along the north slope of the Ochoco NF, the watersheds that flow easterly into the South Fork of the John Day below the South Fork Falls, McKay Creek, Whychus Creek and lower Deschutes River and Crooked River watersheds.

The Matrix of Pathways and Indicators (as developed by National Marine Fisheries Service and U.S. Fish and wildlife Service), which is designed to summarize important environmental parameters and levels of condition includes a large variety of habitat attributes that could be affected by implementation of projects, in this project, as outlined about, only turbidity, shade/water temperature, and fine sediment could be affected. Effects to these species are the same as outlined above. While it would be difficult to measure specific effects due to the scattered nature of the dispersed sites and erosional areas, there would be continued increases in turbidity, increases in fine sediment and potentially some decreases in shading of localized areas. For bull trout and steelhead this alternative would have a May Affect, Not Likely to Adversely Affect, Beneficial Affect, and for redband would have a Beneficial Impact (USFWS and NMFS Consultation Handbook – March 1998). These affects are based on an overall decrease in the acres across both Forests and the Grassland available for motorized travel off designated routes, and a decrease in size of the dispersed sites in riparian areas adjacent to water bodies. This would have a direct decrease in erosion from motorized use, a decrease in areas with bank instability and an increase in riparian plants and shrubs as motorized use is decreased. As a result, turbidity, fine sediment bedload, and shade should become closer to natural levels.

Critical habitat for steelhead and bull trout has been designated across both Forests and the Grassland. Steelhead critical habitat has been designated in the same areas as the current distribution of known steelhead populations. Effects to steelhead critical habitat are no adverse effect with a likely beneficial effect although that would be not measurable. Bull trout critical habitat has been designated only on private lands adjacent to and within National Forest Boundaries. Effects to bull trout critical habitat are, "no adverse effect with a likely beneficial effect," although that would be not measurable.

Biological Evaluation Summary

Table 3-145. Determination for Threatened, Endangered and Sensitive Aquatic Species

Species	Listing	Alt 1	Alt 2	Alt 3
Redband trout *Oncorynchus mykiss* ssp.	sensitive	MIIH	BI	BI
Malheur mottled sculpin *Cottus bairdi*	sensitive	MIIH	NI	NI
West Slope cutthroat trout *Oncorhynchus clarki lewisi*	sensitive	NI	NI	NI
Mid-Columbia River spring chinook Essential Fish Habitat *Oncorhynchus tshawytscha*	sensitive	NAE	NAE	NAE
Mid-Columbia River spring chinook *Oncorhynchus tshawytscha*	sensitive	NI	NI	NI
Bull trout *Salvelinus confluentus*	threatened	NLAA	BE	BE
Mid-Columbia River steelhead trout *Oncorhynchus mykiss ssp*.	threatened	NLAA	BE	BE

Determination for Federally Listed Species, Critical Habitat and Essential Fish Habitat:

NE……..**N**o **E**ffect
LAA……...May Effect - **L**ikely to **A**dversely **A**ffect
NLAA……May Effect - **N**ot **L**ikely to **A**dversely **A**ffect
BE……..**B**eneficial **E**ffect
NAE……...**N**o **A**dverse **E**ffect

Determination for Sensitive Species:

NI……...**N**o **I**mpact
MIIH……..**M**ay **I**mpact **I**ndividuals or **H**abitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species
WIFV…….**W**ill **I**mpact individuals or habitat with a consequence that the action may contribute to a trend towards **F**ederal listing or cause a loss of **V**iability to the population or species
BI……...**B**eneficial **I**mpact

Riparian Management Objectives and Aquatic Conservation Strategy

Riparian Management Objectives (RMO's) for the Deschutes and Ochoco NF's

While there are six RMO's that need to be addressed for projects located in PacFish/InFish areas, there are only two of these that could be affected by the implementation of this action. Water Temperature and Bank Stability are the two RMO's that will be analyzed for effects to both anadromous and resident trout species. The other RMO's of Pool Frequency, Large Woody Debris, Lower Bank Angle, and Width to Depth Ratio (scale of change to small) are not affected by the implementation of this action.

Aquatic Conservation Strategy for the Deschutes NF

The Aquatic Conservation Strategy (NWFP 1994) was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. As part of the ACS there are standards and guidelines that require that projects that are implemented on National Forest lands

within the Northwest Forest Plan areas (the Deschutes NF for this project) “do not retard or prevent attainment of Aquatic Conservation Strategy objectives”. In order to make this finding the analysis must include a description of the existing condition, a description of the range of natural variability of the important physical and biological components of a given watershed and how the proposed project maintains or moves the project toward the natural range of variability.

The current condition portion of this document outlines the important aspects of vegetative, soils, hydrology, and fisheries resources and large areas of concern/impacts that are a result of either motorized access for dispersed camping or motorized access off of designated routes. The following section outlines a generalized description of the natural range of variability for important physical and biological components across both forests. The descriptions are generally taken from work done on the Ochoco National Forest in the Trout Creek Watershed Analysis (1995) and the Mill Creek Watershed Analysis (1996-1997). They have been generalized to describe conditions across the two forests based on Rosgen stream type (1994). While this description includes the physical description of stream types it is assumed for this analysis that reach conditions in the stream and floodplain are largely independent of motorized access for dispersed camping or motorized access off of designated routes because most all of this motorized access is limited to terraces above the stream channel and that actions that influence channel morphology are larger in scale or scope than the access for a particular dispersed site.

This analysis will be used to describe expected vegetative conditions adjacent to the stream that could be impacted by this access. Most all dispersed sites (>99%) across both forests are located on inactive fluvial landforms adjacent to streams. These surfaces are those that have in the past been active surfaces, either as active floodplains or as active channels. For these purposes they are defined as those surfaces outside the 15 year floodplain and are referred to here as terraces. Vegetation on these surfaces is predominately conifer or mixed conifer with a grass and brush understory.

Active channel surfaces (floodplain, channel, etc) are currently more likely to be at vegetation potential in stable systems. Degraded systems may have similar vegetation types but amount/volume may be compromised compared to historic. Vegetation on these surfaces in most cases maintains channel form and function and is independent of motorized access to dispersed sites and motorized access off of designated routes.

Physical Attributes:

Stable stream channels have been described in a variety of classification schemes including Rosgen (1994). Across both National Forests most all channel types exist in various locations and the range of natural variability can be described as outlined below.

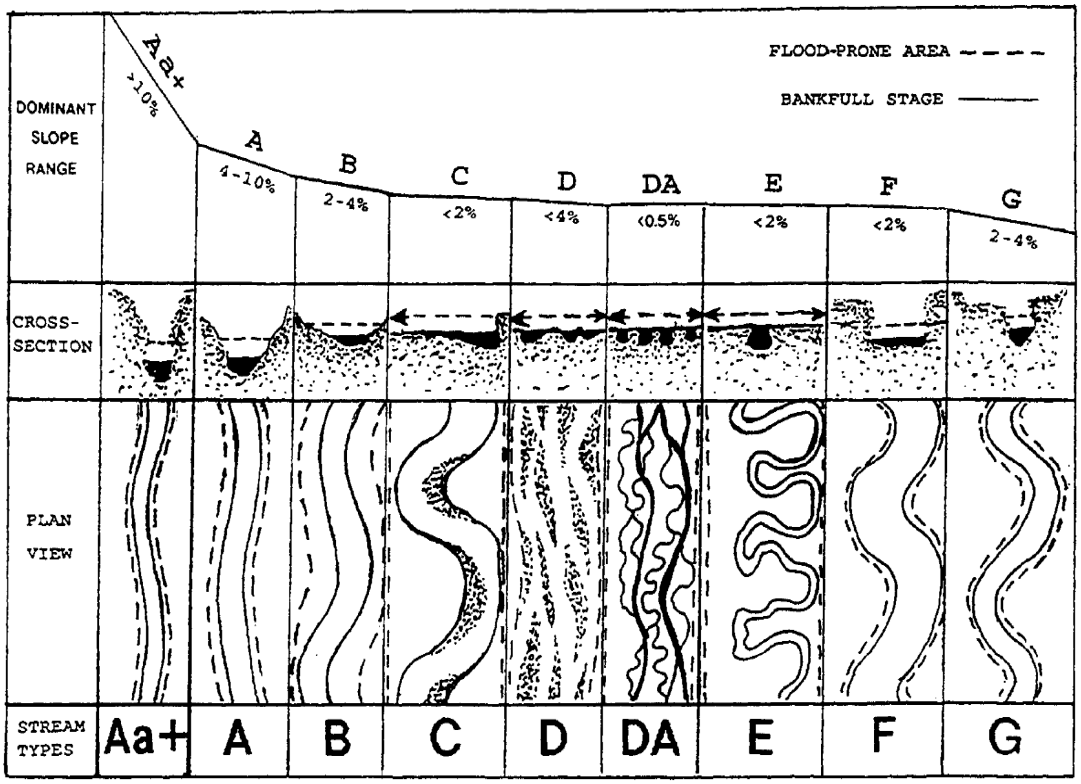
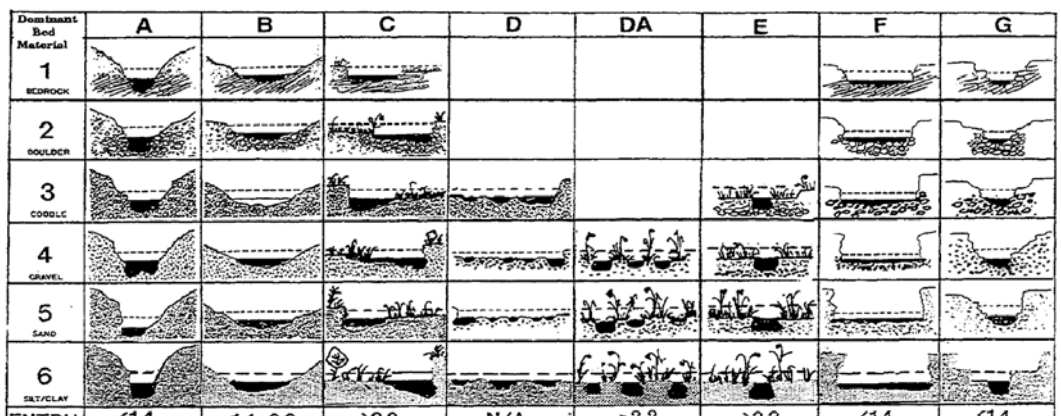


Fig. 1. Longitudinal, cross-sectional and plan views of major stream types.



	A	B	C	D	DA	E	F	G
ENTRH.	<1.4	1.4–2.2	>2.2	N/A	>2.2	>2.2	<1.4	<1.4
SIN.	<1.2	>1.2	>1.4	<1.1	1.1-1.6	>1.5	>1.4	>1.2
W/D	<12	>12	>12	>40	<40	<12	>12	<12
SLOPE	.04–.099	.02–.039	<.02	<.02	<.005	<.02	<.02	.02–.039

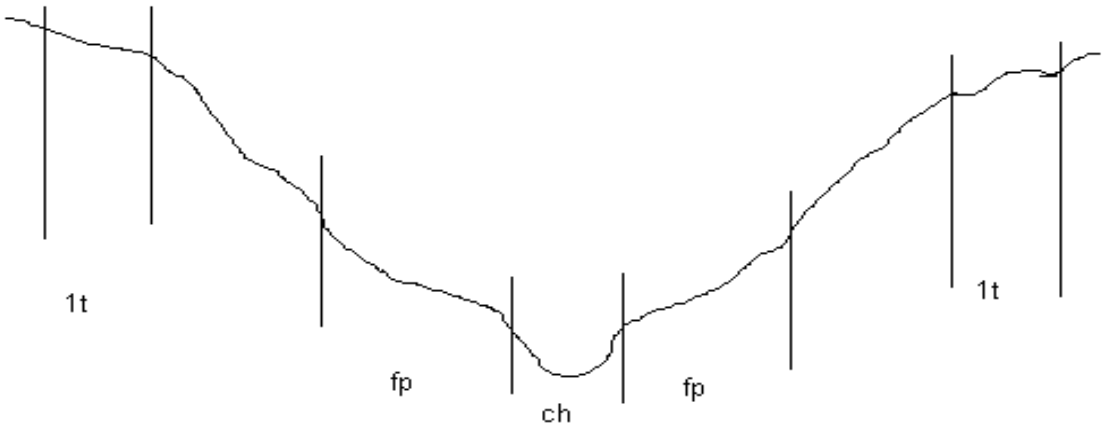
Fig. 4. Illustrative guide showing cross-sectional configuration, composition and delineative criteria of major stream types.

Channel Types General Description:

Following are generalized descriptions of channel types across both forests along with a cross sectional view of the channel, floodplain and terraces. Access for, and dispersed camping itself, takes place predominately on the first or second terrace as depicted in the cross sectional views.

Channel Type A

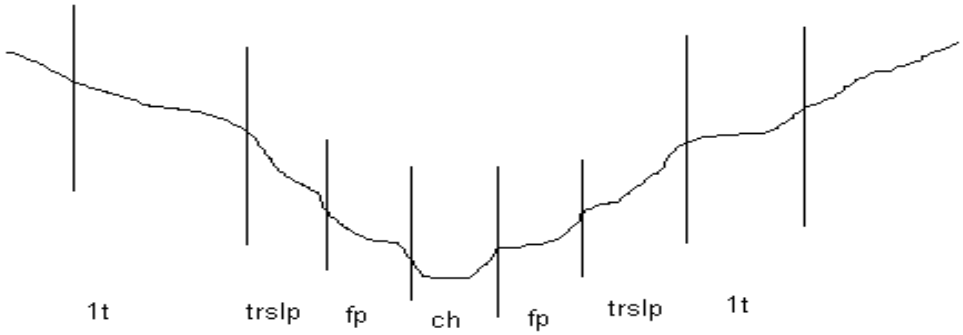
The A channel type complex is shaped by the stability of the system. This erosional system, with high energy and steep gradients, supports fluvial surfaces that are structurally controlled. A channel types are typically at the upper ends of the watersheds located on steeper terrain.



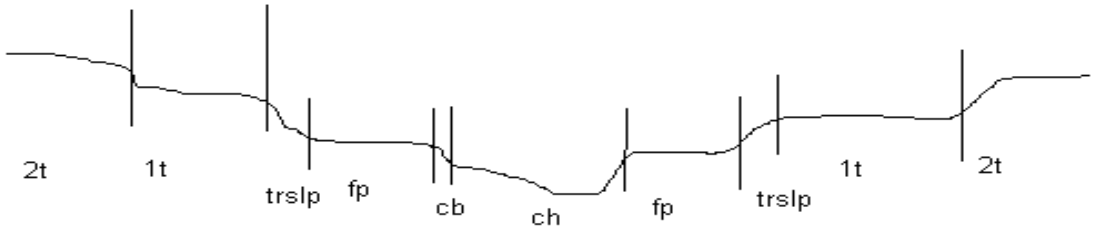
Channel Type A typical cross section: 1t = first terrace, fp = floodplain, ch = channel

Channel Type B and C

The majority of these moderately stable channel types are found at lower elevations across the forest, with C types generally lower than B types. Generally B types are erosional/transport channels while C type channels are more depositional in nature.



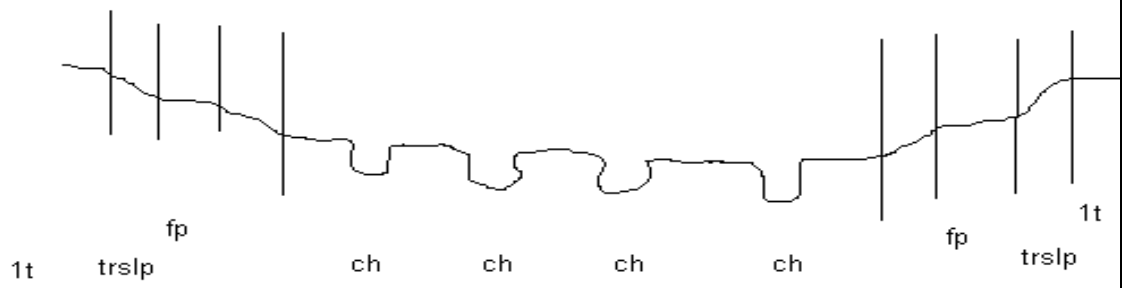
Channel Type B typical cross section:
1t = first terrace, trslp = terrace slope,
fp = floodplain, ch = channel



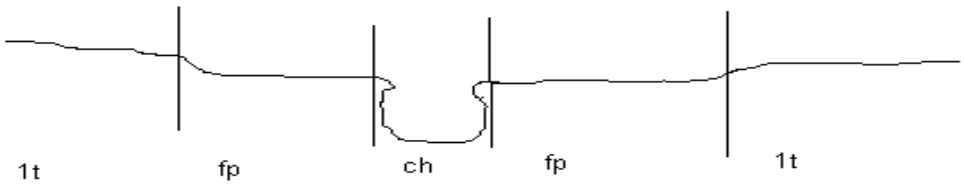
Channel Type C typical cross section: 2t = second terrace, 1t = first terrace, trslp = terrace slope, fp = floodplain, cb= channel bank, ch = channel

Channel Type DA and E

The DA and E channel types complexes are both low gradient, vegetatively controlled, depositional systems. DA supports multiple channels, while the E type is a single channel system.



Channel Type DA typical cross section: 1t = first terrace, trslp = terrace slope, fp = floodplain, ch = channel

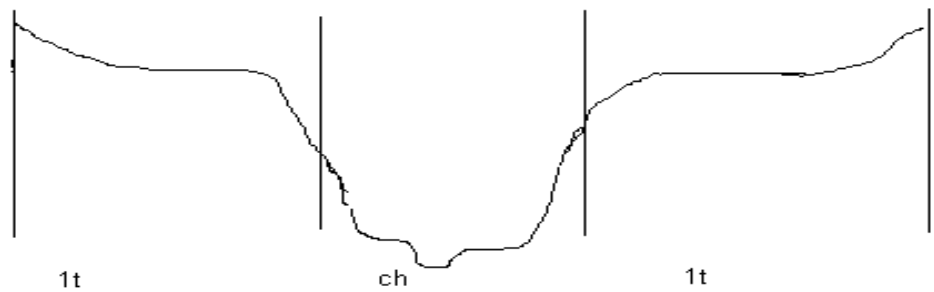


Channel Type E typical cross section: 1t = first terrace, fp = floodplain, ch = channel

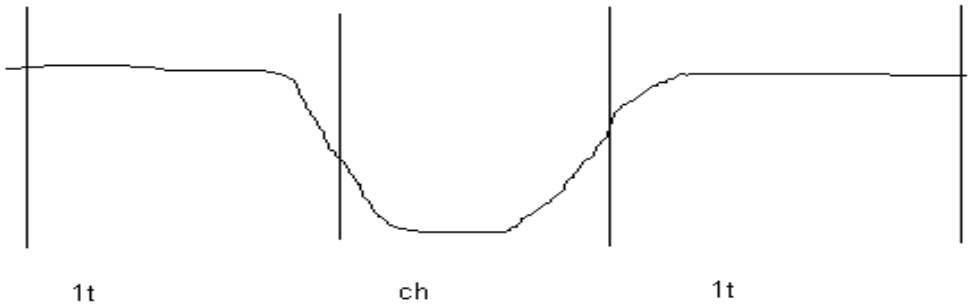
Channel Type F and G

These two erosion channel types indicate sites where stream channel alteration is evident. F and G channels no longer have access to the floodplain, resulting in increased stream energy during high flows, and decreased stream bank stability. The F channel type originates from the G type after the stream re-

equilibrates with channel forming factors. The majority of the “floodplains” in these two complexes are inactive surfaces.



Channel Type F typical cross section: 1t = first terrace, ch = channel



Channel Type G typical cross section: 1t = first terrace, ch = channel

Biological Attributes: The biological attributes that are of concern center mainly around the vegetative component of the riparian reserves or riparian habitat conservation areas. The vegetation in these areas provides shade and large woody debris (overstory) for the stream, and sediment filtering capacity

(understory brushes and grasses), along with bank protection and stabilization (both overstory and understory). The vegetative concerns are specific to the inactive fluvial landforms. These are landforms are the surfaces outside the 15 year floodplain. Erosional and depositional features on these surfaces are not as dynamic as on active landform (floodplain) types. Plant communities are more variable on these landforms and more than 99% of the motorized access across the landscape is located on these surfaces.

Deschutes and Ochoco National Forests and Crooked River National Grassland

Table 3-146 – Potential Natural Vegetation for terraces adjacent to streams/waterbodies. Percentages range + or – 10% based on aspect and elevation.

Channel Types	Ochoco	Grassland	Deschutes
A	85% grand fir 15% cottonwood	65% shrub 15% juniper	28% white fir 23% shrubs 20% hemlock
B	61% grand fir 16% cottonwood 11% Doug-fir	65% shrub 15% juniper	39% white fir 31% shrub 10% lodgepole
C	54 % grand fir 33% cottonwood 10% Doug-fir	65% shrub 15% juniper	43% shrub 24% lodgepole 19% white fir
DA	98% grand fir	none	none
E	86% grand fir 14% cottonwood	65% shrub 15% juniper	49% shrub 30% lodgepole 16% meadows
F	100% grand fir	65% shrub non-riparian 15% juniper	none
G	66% grand fir 11% cottonwood 22% shrub	65% shrub non-riparian 15% juniper	none

Overstory Types with associated Understory:

Grand fir types: grand fir as an overstory, moist or dry understory associate including twinflower, queencup beadlily, big huckleberry, oceanspray, common snowberry, Columbia brome, elk sedge, pine grass, fescues, forbs, and grasses.

Other conifer types: Douglas-fir, ponderposa pine, and western larch as overstory, understory associates include common snow berry, elk sedge, pine grass, fescues, dry forbes and grasses.

Cottonwood types: Cottonwood, alder and aspen as overstory, understory of shrubs, dry forbes and grasses.

Shrub: mixed shrub dominated including prickly and stinking currents, thimbleberry, serviceberry, choke cherry, baldhip rose, oceanspray, common snowberry, dog wood.

Effects to ACS Objectives and RHCA Riparian Management Objectives:

Implementation of this project will have a beneficial effect on ACS Objectives and RMO's and will move the two National Forests and the Grassland toward the natural range of variability for the biological components. The physical components (channel type and floodplain) will remain unchanged from implementation of this project. As outlined above, most all dispersed sites and therefore motorized access to dispersed sites, along with motorized access off of designated routes are located on the first or second terrace in areas adjacent to water bodies. Therefore the access to these areas rarely intersects with the physical components of channel type and floodplain.

The biological components will be affected by this project due to a reduction in motorized access directly to the stream bank edge and a reduction in motorized access off of designated routes across the two Forests and the Grassland. The project design feature of "no motorized access to existing sites within 30' of a streambank, wetland or waterbody" will eliminate compaction and denuding of the area of vegetation from motorized access to dispersed sites within this 30' buffer. This will allow these areas to return to a more natural understory of grasses, forbes, and brush species which will reduce overall sedimentation from erosion that flows from outside this buffer through this area to the stream. Sediment will be more easily trapped in this vegetated buffer and therefore not travel to waterbodies or wetlands. Increased understory vegetation in some cases will contribute to shade increases and bank stabilization.

The direct reduction in motorized access off of designated routes will decrease erosion from areas that are currently being accessed. As these areas recover, vegetation will stabilize these eroding areas and reduce the sediment that may currently be eroding from this use and entering nearby streams and other water bodies or wetlands.

The effects to water temperature and bank stability (RMO's) in all alternatives have been analyzed above and are summarized in Table 3-147 below. These criteria are for attainment of, or progress toward the particular RMO. For water temperature the RMO include no measurable increase in maximum water temperatures, maximum temperatures below 59oF for adult holding habitat and 48oF for spawning and rearing habitats. Bank stability is specific to "non-forested" systems and should exceed 80% stability. Because of the "non-forested" system definition, the only stream systems that this objective applies to are the Rosgen E type streams and a few of the Rosgen C type streams located in meadows.

Table 3-147.

Alternative	Water Temperature RMO	Bank Stability RMO	Comments
Alt 1	Does not meet RMO	Does not meet RMO	Effects not measurable but does not meet the "progress towards" criteria
Alt 2	Meets RMO	Meets RMO	Effects not measurable but does make progress towards the RMO
Alt 3	Meets RMO	Meets RMO	Effects not measurable but does make progress towards the RMO

Summarized ACS Objectives and Effects of the Alternatives:

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted. This project will not affect landscape scale features in any alternative in this project due to the site specificity of the access to dispersed sites and access confined to designated routes.

2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplain, wetlands, upslope areas, headwater tributaries, and intact refugia.
This project will not affect the spatial or temporal connectivity within and between watersheds in any alternative, since it deals with very localized areas in most cases and in all cases none of the changes are on the scale of affecting connectivity within or between watersheds.

3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks and bottom configurations. For Alternative 1 this project will not contribute to maintaining the physical integrity of the aquatic system because of effects to banks, vegetation, and soils that contribute to fine sediment inputs and vegetative decreases. For Alternatives 2 and 3, on a localized basis this project will help to maintain and restore the physical integrity of the aquatic system because the project will limit motorized vehicle access directly adjacent to stream banks which will, in those areas where impacts are occurring, allow for revegetation and stabilization of these banks and shorelines that are currently impacted.

4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. For Alternative 1 this project may have some immeasurable impacts to water quality and sediment due to continued erosion from motorized use. This project may have some impact on improving water quality through reduced sediment inputs, although the amount will likely be immeasurable for Alternatives 2 and 3.

5. Maintain and restore the sediment regimes under which aquatic ecosystems evolved. See #4 above.

6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. This project, in any of the alternatives, will not affect instream flows in any way over the two Forests and the Grassland because the project only affects terraces and uplands on a small scale across the project area.

7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands. See #6 above

8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands. For Alternative 1 this project would not contribute to the accomplishment of this objective, as motorized access off of designated routes would continue to occur which will have impacts on native vegetation in riparian and wetland areas. For Alternatives 2 and 3 this project would contribute to the accomplishment of this objective as limiting access to motorized vehicles will allow for compositional and structural plant diversity to be maintained or increased as areas that are current impacted from vehicular access will be allowed to grow vegetation.

9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian dependent species. See #8 above. In addition, while immeasurable, invertebrate and vertebrate riparian dependent species will likely see an increase as vegetation is reestablished across these sites.

Cumulative Effects

Executive Summary

The direct and indirect physical and biological effects of prohibiting motorized access off designated routes, changing the conditions of motorized access for dispersed camping, and changing the mixed use on existing designated routes are generally beneficial. Therefore, there would be no adverse cumulative effects of implementing these proposed actions on any of the physical or biological resources. The combined physical and biological effects of other past, present, or reasonably foreseeable future actions that also affect motorized access may reduce the level of benefits realized to the physical and biological resources from the proposed actions in this EIS. The cumulative actions that were primarily considered include vegetation management actions that may create conditions more conducive to motorized access, road management activities, and proposed motorized trail projects. Vegetative conditions created by wildfires – although not federal actions under the National Environmental Quality Act – were also considered because wildfire areas can also create vegetative conditions that may be more conducive to motorized access compared to untreated. However, for the most part, the actual degree to which other past, present, or reasonably future actions would reduce the potential benefits of the proposed actions cannot be analyzed in a meaningful way due to the small-scale localized nature of these actions when compared to the proposed actions or because of the uncertain nature of the predicted time and actual impacts of these activities. Ongoing programs and permitted activities are so numerous and ubiquitous across the forest that accumulating extensive site-specific data on activities such as resort operations or individual recreation events is neither reasonable nor warranted in order to understand the potential cumulative effects of the actions considered in this EIS.

The primary potential adverse cumulative effects of these proposed actions, when considered with other past, present, and reasonably foreseeable future action are the reduction or elimination of certain kinds of motorized recreational or access opportunities on an extended area across the Pacific NW Region. The greatest potential cumulative effect is the loss of general motorized access off of designated routes (roads and trails) or outside of designated areas (cross-country travel), given the local, regional, and national application of the Travel Management Rule. There appears to be a trend for limiting motorized access to designated routes on public lands (Upper Deschutes Resource Management Plan, John Day Resource Management Plan, proposed actions for implementing the Travel Management Rule on the Willamette, Umpqua, and Fremont-Winema Forests); as well as private forest and ranchlands and county lands in the local area. Given the national scope of the Travel Management Rule, there is a potentially significant adverse effect to off-road motorized access and recreation across the Pacific Northwest region. The degree to which the Deschutes and Ochoco National Forests are likely to contribute to this cumulative effect cannot be reasonably predicted. However, the development of proposed motorized trail systems may somewhat offset this adverse effect by providing additional designated motorized trail opportunities. This adverse effect may be considerably lessened when combined with the over 800 miles of designated motorized trail systems on public lands in the central Oregon area, and the over 8,000 miles of existing designated roads of varying technical difficulty. There are potential cumulative effects to people's motorized access for dispersed camping as well, although not likely to be as widespread as the effects of limitations on motorized access off designated routes and outside of designated areas.

Affected Environment

According to the EPA's guidance[83] "Cumulative impacts result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. It is the combination of these

[83] Consideration of Cumulative Impacts in EPA Review of NEPA Documents, U.S. Environmental Protection Agency, Office of Federal Activities (2252A); EPA 315-R-99-002/May 1999; pg 2; excerpted from website http://www.epa.gov.

effects, and *any resulting environmental degradation* (emphasis added), that should be the focus of cumulative impact analysis."

The federal actions proposed in this DEIS would prohibit and/or modify the conditions under which motorized access can occur across a two million acre landscape that includes two national forests and a grassland. Thus, the geographic scope of this proposal is quite extensive, and the universe of possible actions – both federal and non-federal - that could be considered as "cumulative actions" within the even larger area encompassed by the lands that lie between the federal lands is immense. This scope necessarily lends itself to proscribing a focused approach to understanding what the most important types of actions are to consider for cumulative effects as indicated by the EPA guidance, and to look at those types of actions at a broad scale rather than a very small local scale where appropriate to the consideration of cumulative effects of the proposed actions.

The analyses of the relevant direct and indirect effect on physical and biological resources from the actions proposed in this DEIS have indicated generally beneficial effects. Determinations of beneficial, neutral, or no adverse direct and indirect effects have been made for those resources analyzed in detail in this DEIS based on a combination of applying the current best scientific literature and landscape-level data analysis and modeling to consider the context, duration, and intensity of probable effects associated with the proposed actions. When considering past, present, and reasonably future actions, both federal and non-federal, the following factors were considered:

- All future federal actions proposed are subject to a variety of laws, regulations, and policies, and procedures such as the provisions of the National Environmental Policy Act, the National Forest Management Act, the Endangered Species Act, or the National Historic Preservation Act[84]. These laws, regulations, and policies help to reduce the potential for adverse direct or indirect effects of future site-specific projects related to key resources such as wetlands and riparian areas, threatened and endangered fish, flora and fauna species. Future actions would also consider the significance of effects of those actions. Even if significant, the potential beneficial effect of the actions proposed in this DEIS would be reduced, but these proposed actions would not contribute to a cumulative degradation of the environment.
- Population growth and increasing development trends for private lands and destination resorts within and adjacent to National Forest lands, while somewhat slowed compared to the recent past, continues to be predicted on an upward trend. Although these non-federal actions are likely to result in increasing impacts on resources associated with motorized access, the potential effects of these actions on National Forest lands would also be reduced as a result of the proposed actions considered in this DEIS (but see effects to Air Quality).

These resources[85] are therefore not considered further in this cumulative effects analysis. This reflects the EPA guidance that the cumulative effects analysis should focus on those actions and effects that could degrade the environment. If the proposed actions have no adverse direct or indirect effects, then the effects

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[84] For example, all types of proposed projects,that would commit new areas with the potential to affect heritage resources detrimentally would require compliance with the Region 6 Programmatic Agreement for implementing Section.106 (S. 106) of the Archaeological Resources Protection Act along with the appropriate application of the National Environmental Policy Act (NEPA). Thus, any potential impacts to heritage resources can be mitigated in specific project design by avoidance or monitoring and archaeological recovery. Tribal consultation would be conducted under both S. 106 and NEPA to determine, among other things, if areas of cultural interest or traditional cultural properties are present.

[85] These include air quality, Congressionally Designated Areas, fire risk, fisheries, geology, heritage resources, hydrology, invasive plants, inventoried roadless areas, native vegetation, range and livestock management, scenery, soils, and wildlife.

of the proposed actions when combined with other past, present, or reasonably foreseeable future actions, would not result in a adverse cumulative effect. Therefore, the analysis of the cumulative effects of the proposed actions are limited to those past, present, and reasonably foreseeable future actions that could contribute to the anticipated adverse direct and indirect effects of the proposed actions.

Adverse effects associated with the proposed actions are primarily related to motorized access, and will potentially adversely affect the communities of interest that value unregulated motorized access to National Forest lands. Therefore, actions that could affect the amount of motorized access were considered in more detail to determine the potential cumulative effect of the proposed actions considered in this DEIS. Those actions that were determined to potentially affect the amount of area or conditions of use for motorized access considered in this DEIS are:

- **Vegetation management activities** within areas open to motorized access for dispersed camping under either general or special provisions or motorized access off of designated routes. Vegetation management activities may create conditions that are more conducive to motorized access off designated routes or to motorized access for dispersed camping than many untreated areas. The activities considered in detail included hazardous fuels, timber, and silvicultural treatments. (See Appendix B-4.3 for detailed descriptions of these treatments). Descriptions of these activities that could affect motorized access that were completed prior to 2004 are included in the past actions & existing condition section of this analysis, and those planned or completed after 2004 are included in the description of present and reasonably foreseeable actions (See Chapter 3 "Vegetation Management Activities").
- **Proposed motorized trails projects.** These projects would increase the amount of designated motorized routes, staging areas, "open" areas, and could add areas designated for motorized access for dispersed camping. These projects were described in Chapter 2 and are included in present and reasonably foreseeable future actions.
- **Motorized access and road management decisions.** Past decisions about motorized access have contributed cumulatively to the amount and conditions of motorized access across the two forests and grassland. Road management decisions and other National Forest travel management decisions may result in the changing of routes and areas that are open to public use. Past decisions about motorized access or road management decisions are included in the past actions and existing conditions. Proposed road management decisions are included in the present and reasonably foreseeable future actions.

Management of dispersed campsites across the two Forests and Grassland was also initially considered in the evaluation of the potential for cumulative effects of the proposed action. There are ongoing activities across both Forests and the Grassland to manage dispersed campsites that could add boulders or wood structures to existing dispersed sites, thus increasing or decreasing riparian setbacks within localized areas, and eliminating, reducing, or otherwise changing some existing motorized access to dispersed campsites. These ongoing program actions are usually minor, and are not expected to significantly contribute to any adverse effect to motorized access absent additional environmental analysis and decision-making as required by the National Environmental Policy Act.

Although the clear intent of the CEQ regulations are to focus on federal and non-federal *actions*, landscape conditions such as wildfires can also contribute to conditions that could affect motorized access across the landscape. Fire is a significant disturbance mechanism on the Deschutes and Ochoco National Forests. Historical Forest records indicate that fires, both human and lightning-caused, have burned significant acreage across both Forests, despite fire suppression efforts. On the Deschutes, fire history records (which generally contain fires larger than 100 acres) from 1908 to 2007 show that 238 fires have burned over 411,000 acres (approximately 318,000 acres of ground; 16% of the Forest total). On the Ochoco National Forest, similar fire history records from 1961 – 2007 show that 33 fires have burned nearly 57,000 acres

(approximately 46,000 acres of ground; 6% of the Forest total). Therefore, past wildfires were also considered as a part of the existing conditions that could affect motorized access.

Past Actions & Existing Conditions That Affect Motorized Access

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one can not reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions risks ignoring the important residual effects of past natural events, which may contribute to cumulative effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects. Finally, the Council on Environmental Quality issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." The cumulative effects analysis in this (EA or EIS) is also consistent with Forest Service National Environmental Policy Act (NEPA) Regulations (36 CFR 220.4(f)) (July 24, 2008), which state, in part:

> "CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decision making. (40 CFR 1508.7)"

Vegetation Management Activities & Wildfires[86]

2004-2008 – This grouping of projects is the most recent, and are likely to have the freshest and perhaps most distinct changes in vegetative conditions. During this time period, 112,915 and 59,738 acres of ground, respectively, on the Deschutes and Ochoco National Forests, received some sort of planned vegetation treatment that may have resulted in forest conditions more conducive to motorized access. Approximately 83% and 90%, respectively, on the Deschutes and Ochoco National Forests, of these acres are currently open to motorized access for dispersed camping, and 58% and 74%, respectively, on the Deschutes and Ochoco

[86] Spatial records may overestimate actual treatment completed on the ground. The extent of this overestimation was not determined.

National Forests, of these acres are currently open to motorized access off designated routes. See Table 3-148 for a breakdown of these acres. See Appendix B-4.3.2 for project or planning area names and acres of treated ground, and the NEPA documents under which most of these acres were treated. Of these acres, approximately 34,948 acres on the Deschutes and 11,756 acres on the Ochoco would continue to be available for motorized access for dispersed camping under either general or special provisions in Alternative 2. Under Alternative 3, the amount of area available for motorized access for dispersed camping would be limited to only those areas with existing, designated or defined sites. This would alter the potential for motorized access to affect vegetation management, since vehicles would be restricted to designated, existing, and defined dispersed camping sites, limiting future ground disturbance.

Table 3-148 Acres of planned vegetation treatments in areas open to motorized access off designated routes or motorized access for dispersed camping that may result in forest conditions more conducive to motorized access on the Deschutes National Forest from 2004 – 2008.

Forest	Open to motorized access of off designated routes (acres)	Open to motorized access for dispersed camping (acres)
Deschutes NF	65,197	93,247
Ochoco NF	44,151	53,840

During this time period on the Deschutes National Forest, the most common management activities within those acres were burning of piled material; piling of fuels (hand or machine); precommercial and commercial thinning. Similarly on the Ochoco National Forest, the most common management activities during this time period were precommercial thinning, underburning, pile burning, jackpot burning; and hand or machine piling of fuels.

During this time period, approximately 31,689 acres of the Deschutes and Ochoco National Forests were reported as burned by large wildfires (excluding 2008-data not available at time of analysis). 2,258 of these acres are currently open to motorized access for dispersed camping and 1,850 open to motorized access off designated routes. These fires are listed in Table 3-149. Within these areas, approximately 3,625 acres on the Deschutes and 443 acres on the Ochoco National Forest would continue to be or are proposed to be open to motorized access for dispersed camping under general or special provisions in Alternative 2.

Table 3-149. Large wildfires on the Deschutes and Ochoco National Forests from 2004 to 2007. Fires names highlighted with bold text have burned in areas open to motorized access for dispersed camping and/or areas open to motorized access for dispersed camping

Fire Name	Year	Acres Reported	District
Deschutes National Forest			
GW	2007	7357	Sisters
Woodside Ranch	2007	589	Bend Fort Rock
Lake George	2006	5550	Sisters
Cave	2005	652	Bend Fort Rock
Black Crater	2006	9400	Sisters
Ochoco National Forest			
Buck Butte	2002	105	Crooked River NG
Geneva 3	2006	480	Crooked River NG

Fire Name	Year	Acres Reported	District
890	2006	382	Crooked River NG
Mill	2005	29	Lookout Mountain
Maxwell	2006	7145	Lookout Mountain

Pre - 2004 - This grouping of projects has occurred long enough ago that, depending upon site conditions, change from the vegetative conditions in place immediately following the treatment may have occurred. During this time period, 560,116 and 189,696 acres of ground, respectively, on the Deschutes and Ochoco National Forests, received some sort of planned vegetation treatment that may result in forest conditions more conducive to motorized access. Approximately 51% (285,605 acres) and 84% (159,739 acres), respectively, on the Deschutes and Ochoco National Forests, are currently open to motorized access for dispersed camping and 79% (441,512 acres) and 95% (180,932 acres), respectively, of these treated areas on the Deschutes and Ochoco National Forests, are currently open to motorized access for dispersed camping. The conditions resulting from these planned vegetation treatments and wildfires prior to 2004 are reflected in the 2004 satellite imagery which is used in support of the analysis of the vegetative conditions for this EIS for other resource specialties (e.g., Wildlife), and are therefore not presented in the body of this chapter. Appendix B-4.3.3 includes a detailed list of the wildfires and acres treated that were considered as contributing to this existing condition prior to 2004.

Motorized Access & Road Management Decisions

Past actions and decisions that have contributed to the existing conditions affecting motorized access include establishment of Congressionally Designated Areas such as Wilderness, Wild and Scenic Rivers, and the Newberry National Volcanic Monument; and associated Forest Land and Resource or Travel Management Plans that have limited motorized access to differing degrees. A description of the existing condition of motorized access is included in the description of the amount of area open to different types of motorized access in Alternative 1 in Chapter 2 and 3. Approximately 1300 miles of open roads have been closed or decommissioned on the Deschutes and Ochoco National Forests since 1990.

Present and Reasonably Foreseeable Future Actions

Vegetation Management Activities

For the purpose of this analysis, reasonably foreseeable future vegetation management activities are those that are “in-progress” or “completed”, in terms of status in the NEPA planning process (as opposed to status of implementation on the ground) in fiscal year 2009 (October 1, 2008 – September 30, 2009). Explicit planned treatment acreage is available for “completed” projects only. In the reasonably foreseeable future, approximately 36,822 and 266 acres on the Deschutes and Ochoco National Forests are planned to be treated under NEPA completed in fiscal year 2009. These projects may fall within areas proposed to be open to motorized access for dispersed camping under either general or special provisions in Alternative 2 that would lead to additional acreage that is more conducive to motorized access than many untreated areas. See Chapter 3 “Vegetation Management Activities and Wildfire” for more detail related to these projects.

Motorized Access Decisions
The Forests surrounding the Deschutes and Ochoco National Forest include the Fremont-Winema, Umpqua, Malheur, and Willamette. The Umpqua, Malheur and Willamette are anticipated to publish their Motor Vehicle Use Maps in December of 2009 and the Fremont-Winema is anticipated to publish their Motor

Vehicle Use Map in March of 2010. All National Forests in the Pacific NW Region are anticipated to have their Motor Vehicle Use Maps completed by the end of 2010.

Road Management Activities
Based on the current Schedule of Proposed Actions, 300-400 miles of existing designated open roads are currently being proposed for closure or decommissioning through a variety of projects. However, final decisions on these projects have not been completed.

Proposed Motorized Trails Projects

The Three Trails and Lava Rock Motorized Trails Projects, as currently proposed, could include nearly 400 miles of additional proposed motorized trails for different classes of vehicles. The Ochoco Summit Motorized Trail Project and the Meadow Lakes Restoration Project are currently too early in the development process to have specific proposals for miles of trails.

ANALYSIS OF CUMULATIVE EFFECTS

The National Forests surrounding the Deschutes and Ochoco National Forest and in the entire Pacific NW Region are in the process of implementing the Travel Management Rule or have existing travel management plans that are generally resulting in fewer opportunities for motorized access off of designated routes (cross-country travel), and fewer open routes for OHV use. This is also a trend being seen on private industrial timberlands that are within or adjacent to the National Forests. Alternatives 2 and 3 would both contribute equally to this cumulative effect locally, regionally, and nationally by actions proposed on the Deschutes and Ochoco National Forests.

Although not as clearly a trend, motorized access for dispersed recreation is also cumulatively limited as a result of the overall limits on motorized access off of designated routes and the restriction of the Travel Management Rule to motorized access solely for dispersed camping within a limited area adjacent to open designated roads. The cumulative effect on motorized access on open roads and trails is less clear than that effect on motorized access off of designated routes.

Nationally, there has been since 2000, and continues to be an increasing emphasis on completing analyses to identify a “minimum transportation system” that is ecologically, socially, and economically sustainable. Given the high road densities and increasingly reduced road maintenance budgets on the Deschutes and Ochoco National Forests, trends for open road closures and decommissioning are also likely to continue. Alternatives 2 and 3 would contribute to the cumulative effects of reducing areas available to motorized access for dispersed camping by limiting motorized access for dispersed camping to areas adjacent to existing designated open roads, and by establishing special provisions for motorized access for dispersed camping that further restrict motorized access to the area adjacent to open designated roads. Alternative 3 would have a greater potential for cumulative effects than Alternative 2 by establishing special provisions for motorized access for dispersed camping everywhere that motorized access for dispersed camping would be allowed.

The Three Trails and Lava Rock Motorized Trails Projects, as currently proposed, and the Ochoco Summit Motorized Trail Project as currently being developed, all have the potential to increase the amount of designated motorized routes, staging areas (which often include areas for motorized access for dispersed camping), areas designated as open to motorized access off of designated routes (cross-country travel), and miles of road that would be open to motorized mixed use. Cumulatively, this would reduce to some degree the potential adverse effects of the actions proposed in this DEIS on motorized recreational trail opportunities on the Deschutes and Ochoco National Forests. The proposed trail systems would provide a mix of new motorized trail opportunities, however, the exact amount or location of these proposed trails is

either unknown or unpredictable at this stage of the analysis. These actions also have the potential to change the location and amount of open roads within the project areas that are available for motorized access for dispersed camping, either to increase or decrease the cumulative amount that could be anticipated under Alternative 2 and 3.

It is reasonable to say that OHV opportunities are being reduced cumulatively by travel management decisions on National Forest and other public and private lands throughout the Pacific Northwest. It is known that these reductions in opportunities would displace some users from currently accessed areas, roads, and trails. What is not known is whether the overall amount of OHV use either locally, regionally, or nationally would be reduced as a result of the reduced opportunities or if current use would just be concentrated into the smaller areas where OHV opportunities continue or are developed in the future. It is also uncertain how fuel prices could affect this use into the future. If the overall use is reduced, the magnitude of the reduction is not known nor is it known where these reductions might occur. Without this knowledge, it is not possible to make reliable predictions about the social and economic cumulative effects based on reduced use.

Areas that are more conducive to motorized access because of vegetation management activities or wildfire conditions could cumulatively result in an increase of the areas that may actually be available to motorized access for dispersed camping in Alternative 2. When considering past conditions and future proposed actions, the cumulative effect of these actions when combined with the proposed actions in Alternative 2 could result in as much as 38,573 acres on the Deschutes and 12,199 acres on the Ochoco National Forest where conditions within 300 feet of open designated routes could be more conducive to motorized access than if these other activities had not taken place. There would be no potential for cumulative effects from these actions or conditions in Alternative 3, because motorized access for dispersed camping would be limited to presently existing or future designated or defined sites.

Other Required Disclosures

Climate Change

Executive Summary

The Forest Service is currently investing in considerable research and study of the potential effects of forest management on climate change.[87] Past Forest Service Chief Abigail Kimbell organized, and current Chief Tom Tidwell has continued, an agency-wide response to climate change and direction for the agency to concentrate on 16 priorities for action. While many of these priorities and much of this information is generally not applicable at the project level, we have consulted much of this research (Loewen 2008).

On January 16, 2009, the Washington Office of the Forest Service released guidance to Forest Service units regarding the incorporation of climate change science into project-level NEPA documents (USDA 2009d). This guidance document provides that units should consider two kinds of climate change effects. First, units may, where appropriate, consider the effect of a project on climate change. Second, units may, where appropriate, consider the effect of climate change on a proposal. This latter category may include the effect of changed snowfall regimes on special use permit issuance for ski areas or the effect of rainfall changes on reforestation following a timber sale. Because potential changes in climate will have no effect on the designation of motorized routes, this second category of effects was not considered further.

Understanding and documenting the effects of Forest Service decisions on climate change is an important priority for the agency under Chief Tidwell. The Washington Office has issued guidance to units outlining procedures for assessing the effect of proposals on the climate. Following that guidance, the Interdisciplinary Team considered the potential direct effect of route designation on the emission of GHG and determined that it would have no direct effect. The Interdisciplinary Team also considered the indirect effect of potential emissions causing changes in the climate due to increased atmospheric gases and concluded that there are no measurable indirect effects from route designation.

General Effects of Projected Climate Change

The Atmospheric-Ocean General Circulation Model (AOGCM) projects a general warming with the magnitude projected to increase almost linearly over time. Warming in the USA is projected to exceed 2ºC (3.6ºF) by nearly all models and to exceed 4ºC (7.2ºF) by more than 5 AOGCMs out of 21 by the turn of the next century. Christensen et al. (2007) in Table S11.2 indicate that by the turn of the next century December through January temperatures in Western North America (WNA) could increase 3.7ºC (6.7ºF) and precipitation increase by 7 percent based on the 50 percentile probability on a normal distribution bell curve using Tebaldi et al.'s method. June through August temperatures are projected to increase 3.6ºC (6.5ºF) and precipitation decrease 4 percent. This much of a temperature increase would probably move the transitory snow line to near 6,000 feet based on an adiabatic lapse rate of 250 feet per 1ºF (half way between dry and usual saturated above freezing lapse rate).

The following projected climate changes in the hydrologic cycle are presented in Climate Change and Water – Perspective from the Forest Service (2008):

- Warmer air temperatures
- Warmer stream and reservoir water temperatures
- More rain and less snow with earlier snowmelt

[87] See http://www.fs.fed.us/climatechange/.

- Earlier spring runoff with larger flood peaks. Less summer stream flow with smaller headwater stream networks
- More precipitation in the Pacific Northwest with greater inter-annual variability
- More intense storms with more flooding and extreme winds
- More evapotranspiration. Dryer vegetation and soils. More severe droughts. Increased wildfires and area burned.

Peak Flow

Increased rain-on-snow events would increase extreme runoff contributing to more severe flood events. Peak flows from snow melt would occur earlier in the spring. High discharges from intense summer thunderstorms would also increase.

Base Flow

Increased rainfall over snowfall, warmer winter temperatures, and the increase in the transitory snow zone will result in lower snow packs. The onset of earlier spring snowmelt will shift the bulk of the hydrograph to earlier in the season. This will result in less summer stream flow and an increase in intermittent and spatially intermittent stream flow (less perennial stream miles).

Water Quality

Higher peak flows resulting from rain on snow events and high intensity summer thunderstorms could result in increased surface and channel erosion especially in the scab stringer country.

Temperature

Higher air temperatures and decreased summer stream flows would result in higher water temperatures.

Analysis of Environmental Effects

Agency direction defines the emission of greenhouse gases (GHG) as the direct climate change effect of a project. Further, the interaction of emissions with atmospheric concentrations of GHG such that they impact the climate is defined as the potential indirect climate change effect.

Under this definition, there is no direct effect associated with any of the proposed actions considered in Alternative 2 and 3. These alternatives do not authorize the emission of GHG; the action alternatives do not limit the emission of GHG; the action alternatives are unlikely to change the emission of GHG as compared to the no action alternative. GHG emissions from motorized travel are not directly affected by the designation of routes.

Alternatives 2 and 3 may have a slight beneficial effect on climate change by restricting motorized vehicles to designated routes and protecting forest resources from damaging traffic. Forest Service direction on climate change consideration notes, “[i]t is possible, and in some projects likely, that proposals may meet the Agency’s mission while also enhancing the resilience or adaptive capacity of resources to the potential impacts of climate change. For example, projects designed to restore the health, resilience, and productivity of forested ecosystems may also improve the capability of the stands or landscape to withstand climate change stresses” (USDA 2009c). While these proposed actions are not specifically designed to reduce the emission of GHG, it may have a slight benefit associated with enhancing the resilience and productivity of forested ecosystems.

Regarding indirect effects, Agency direction states, “[b]ecause greenhouse gases mix readily into the global pool of greenhouse gases, it is not currently possible to ascertain the indirect effects of emissions from single or multiple sources (projects). Also, because the large majority of Forest Service projects are extremely

small in the global atmospheric CO_2 context, it is not presently possible to conduct quantitative analysis of actual climate change effects based on individual projects" (USDA 2009c). Alternatives 2 and 3 do not have measurable indirect effects as compared with the no action alternative.

Because the proposed actions have no quantifiable direct or indirect effect on climate change, there are no anticipated cumulative effects.

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).

This chapter and the specialist reports prepared for this project provide the required disclosure of effects from anticipated use associated with the motorized access allowed under the current condition (Alternative 1) and as modified by Alternatives 2 and 3.

As detailed in this chapter, Alternative 1 would allow the most motorized access and thus the highest level short-term uses of natural and depletable Forest resources of the three alternative considered in detail, and it would also result in the greatest potential impact to long-term productivity. The action alternatives provide varying amounts of motorized opportunities, and they have varying impacts to the short-term uses of the Forest. All action alternatives reduce the existing and potential impacts to long-term productive when compared to the existing condition.

Unavoidable Adverse Effects

Beneficial and adverse effects on the human environment that might result from implementation of the alternatives considered in detail are analyzed earlier in this Chapter. The National Environmental Policy Act requires disclosure of "…any adverse environmental effects which cannot be avoided should the proposal be implemented…." (40 CFR 1502.16).

The proposed actions would prohibit motorized access for dispersed camping and modify the conditions under which motorized access for dispersed camping would be allowed. These actions would be, for the most part, beneficial to physical and biological resources. Actions associated with past decisions – including the establishment of existing designated roads and trails – are not included in this discussion as they are not a part of this proposed action.

There would be unavoidable adverse effects to people's ability for motorized access to some areas of the National Forests and Grassland when compared to the current management direction. This is a social effect rather than an effect on the natural resources of the environment.

The designation of rock pits as areas that would be open motorized access off designated routes (cross country travel) in Alternatives 2 and 3 would represent a high-level of risk for the spread of invasive plants.

However, Alternatives 2 and 3 would significantly reduce the risk of invasive plant spread currently present in Alternative 1 across the two forests by eliminating motorized access off designated routes from most interior areas and rock pits. Changing the conditions of motorized access for dispersed camping would also significantly reduce, but not eliminate the potential for spread of invasive plants. Invasive plants sources come from outside of the National Forest, and cannot therefore be completely mitigated with any action confined to Forest Service authority.

Irreversible and Irretrievable Commitments of Resources

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

The proposed actions would not make any new commitment of resources to designated motorized routes and areas. All routes analyzed in this EIS currently exist on the ground and have been designated by past administrative actions. The proposed actions would designate some mineral material sources as open to motorized access off designated routes (cross-country travel), but these areas have already been committed to extractive use by past actions. The use of these areas are primarily for mineral material sources, and are secondarily being made available for motorized use with this decision.

Areas that would prohibit motorized access off designated routes or prohibit motorized access for dispersed camping under Alternatives 2 and 3 would be an irretrievable loss of opportunity to access those areas that currently allow such access.

Incomplete and Unavailable Information

The Council on Environmental Quality's implementing regulations for the National Environmental Policy Act requires, "When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking." (40 CFR 1502.22)

The primary potentially reasonably foreseeable significant adverse effects associated with the proposed actions identified in this DEIS are related to the effect of changing how people can access the two National Forests with a motor vehicle, and how that might affect people's activities or uses. As noted in the Social and Economic analysis in this Chapter, how or even if people's motorized uses will change as a result of these proposed actions either singly or when combined with other National Forest's implementation of the Travel Management Rule is incomplete or unavailable information. It is not feasible to be able to collect this information at a scale or in a manner that could help to better inform the decision-maker than what has already been collected and presented here. In addition, the Deschutes and Ochoco National Forest and the adjacent lands managed by the Bureau of Land Management provide some of the most premier off-road vehicle designated trail systems in the state. There are many other opportunities within a day's drive of central Oregon. Therefore, even though information is lacking to be able to accurately predict how all motorized users may be affected by these proposals, the
Motorized access opportunities, uses and trends that have been presented and summarized in this EIS provide sufficient information about both motorized and non-motorized future uses to make a reasonable choice between the alternatives.

Energy Requirements

Energy Requirements of Alternatives

Managing for motor vehicle uses on the on the Deschutes and Ochoco National Forests and promoting recreation use in general, under all the alternatives would result in the consumption of energy. For environmental impact statements, NEPA requires a discussion of the energy requirements and conservation potential of proposed alternatives and mitigation measures [40 CFR 1502.18 (e)]. The following addresses these topics.

The area of analysis for this issue, the affected environment, is at least regional in scope and cannot be defined solely for an individual national forest. There are numbers of vehicles that drive on state and local highways that pass through the two forests as they travel to other destinations, commute, or vacation in the region. There are numbers of vehicles that drive to Deschutes or Ochoco National Forest access sites or drive on Forest Roads to access recreation opportunities, and there are motor vehicles (OHVs, motorcycles, RVs, SUVs, etc.) that use the Forest Roads, trails, and areas.

The Deschutes and Ochoco National Forest and the other national forests and public lands in the area attract many visitors every year and the amount of energy use associated with this travel has increased. Likewise, the numbers of highway vehicles and recreational motor vehicles that use the two forests have been increasing, although there is no quantifiable estimate of the numbers of these vehicles.The categories of energy-consuming activities directly or indirectly connected with recreational use of the forests include: motor vehicle traffic that passes through the forestson state and local highways, motor vehicle traffic to access forest sites or drive on Forest Roads, and recreational motor vehicles that use the forests.

The first category of use cannot be considered as being affected by the proposed actions considered in the Deschutes and Ochoco National Forests Travel Management DEIS, even though the users could be enjoying the scenery as they are traveling through the forests and they would be counted as visitors to the national forest. None of the actions proposed in this DEIS would affect this category of travel. The second and third categories of use would be affected to some degree by the alternatives considered in this DEIS because the proposed actions would include reducing the miles of roads available to non-highway legal vehicles, would propose to prohibit motorized access off designated routes to over 98% of the area of the two forests that currently do not prohibit such access, and by changing the conditions of motorized access for dispersed camping along existing designated open routes. Changing the mileage available to non-highway legal vehicles is unlikely to affect the energy consumption within the area, and, it is uncertain the degree to what degree that motorized use off designated routes would be altered to use designated routes or whether that use would be displaced to other areas. Therefore, the effects on energy consumption resulting from these possible changes in use patterns cannot be reasonably predicted. However, recreation use is predicted to increase regardless of the alternative selected. Currently, there are plans being proposed to increase non-motorized or public transit options between the primary urban centers and the forests.

Prime Farmlands, Range Land, and Forest Land

Actions proposed under any of the alternatives would have no impact on farm land, range land, or forest land inside or outside the national forest.

Effects on Laws, Regulations, Plans, Policies, and Procedures

The National Environmental Policy Act at 40 CFR 1502.25(a) directs “to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with …other

environmental review laws and executive orders." This section includes a brief summary of those laws, policies, and executive orders that are relevant to the proposed actions considered in this EIS.

Travel Management: Designated Routes and Areas for Motor Vehicle Use; CFR 212, 251, 261, and 295

Alternative 1 would not be consistent with the Travel Management Rule. Alternatives 2 and 3 would both meet the intent of the Travel Management Rule.

National Forest Management Act Forest Management Act

The National Forest Management Act (NFMA) directs all action taken on National Forests to be consistent with the Forest Land and Resource Management Plans prepared in accordance with the regulations of the NFMA. A brief description of relevant findings related to Forest Plan consistency for the actions proposed in this DEIS follows.

Forest Plan Consistency
Deschutes & Ochoco National Forests

Travel Management Plans

Currently, the Deschutes and Ochoco National Forest Plans have a variety of Standards and Guidelines that restrict some or all motorized access within certain Management Areas. This guidance has been translated into Travel Plan maps that have been published for summer and winter in the past. For the Deschutes, the Forest Plan specifically requires, "The Forest will prepare and periodically update a Forest Travel Plan which will identify areas, roads, and trails which are open or closed." (Deschutes National Forest Land and Resource Management Plan (LRMP) page 4-33, TR-8).

The Motor Vehicle Use Map (MVUM) published after the release of the Record of Decision for this EIS in Alternatives 2 and 3 would function as the new Travel Map for the Deschutes and Ochoco National Forests, and Crooked River National Grassland, for non-winter use. The previously published Travel Plan maps would continue to provide motorized access information for winter use. Although the Ochoco National Forest Plan (LRMP) has no similar specific Forest Plan requirement, publication of the Motor Vehicle Use Map meets the requirement of a Forest Travel Plan and will become part of the management direction of the Forest Plans replacing the current plans (maps).

Motorized Travel off Designated Routes (Cross-Country Travel)

Cross-country travel on the Deschutes National Forest has largely been regulated by Forest Plan Standards and Guidelines that prohibit or restrict motorized access in certain areas, or other federal actions that have applied specific motorized access restrictions in certain areas. There are no area-specific Standards and Guidelines that designate areas as "open" to cross-country travel. In general, this use has been allowed unless specifically prohibited or otherwise regulated. Implementation of any of the Alternatives would therefore be consistent with the Deschutes National Forest Plan because there would be no new Standards and Guidelines required by the Travel Management Rule in order to prohibit motorized access off designated routes, and no amendments to existing Standards and Guidelines required to be consistent with existing prohibitions.

The Ochoco National Forest Plan, while also not having any Standards and Guidelines that specifically designate any areas as "open" to cross-country travel, have one Forest Plan Standard and Guideline that is specific to motorized use related to routes and areas that would be amended in Alternative 2 and 3:

"Motorized use encouraged on designated routes and areas and restricted to designated routes only in riparian areas. Motorized use restricted to designated routes on sensitive soils including highly erodible slopes over 30% during wet weather from Dec 1 to May 1. Motorized use on scablands restricted to designated routes and existing two-track non-system roads." This Standard and Guideline would be eliminated for the Ochoco National Forest, except on the Emigrant Creek Ranger District[88].

Alternative 1 would be consistent with current Forest Plan management direction.

Motorized access for dispersed camping

Similar to motorized access off designated routes, there is little specific direction that prohibits or otherwise specifically designated regulation of motorized access for dispersed camping. For the Crooked River National Grassland, The Ochoco Forest Plan would be amended to allow motorized access for dispersed camping under the both general and special provisions described in Alternative 2 and 3 in the General Forage and Dispersed Recreation Management Areas.

Endangered Species Act

Effects to Threatened, Endangered species are evaluated in the Fisheries, Native Plants, and Wildlife sections of Chapter 3 of this EIS. The Endangered Species Act of 1973 requires that actions of federal agencies do not jeopardize or adversely modify critical habitat of federally-listed species. A Biological Evaluation has been completed for threatened endangered and sensitive fishery, plant, and terrestrial species. Consultation with the USFW under Section 7 of the Endangered Species Act has been initiated on the preferred alternative.

Clean Water Act

The objective of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of all waters to protect the Beneficial Uses as documented according to Oregon Department of Environmental Quality (ODEQ) criteria. A beneficial use is a resource or activity that would be directly affected by a change in water quality or quantity and are defined on a basin scale in the Oregon Administrative Rules for water quality. The beneficial uses for this project were derived from the four basins encompassed by the two Forests and Grassland.

The beneficial uses in the Travel Management project area include fish and aquatic life, fishing, wildlife and hunting, livestock watering, water contact recreation, boating, irrigation, public water supply, private domestic water supply, hydro power, and aesthetic quality.

[88] The Emigrant Ranger District, formerly the Snow Mountain District of the Ochoco National Forest was renamed, combined with the Burns Ranger District, and is administered by the Malheur National Forest.

Under Section 319 of the 1987 Clean Water Act Amendments, states are required to determine those waters that will not meet the goals of the Clean Water Act, determine those non-point source activities that are contributing pollution, and develop a process on how to reduce such pollution to the "maximum extent practicable." Section 303(d) of the Clean Water Act requires that a list be developed of all impaired or threatened waters within each state. The ODEQ is responsible for compiling the 303(d) list, assessing data, and submitting the 303(d) list to the Environmental Protection Agency (EPA) for federal approval.

There are 96 303(d) listed streams and water bodies in the Travel Management project area. Only water temperature, sediment, and turbidity would reasonably be expected to be potentially effected by proposed actions in this project. There are 19 streams listed for water temperature on the Deschutes National Forest and 73 on the Ochoco National Forest and Crooked River National Grassland. The Deschutes River between Wickiup Reservoir and Bend on the Deschutes National Forest is listed for sediment and turbidity. Eight streams on the Ochoco National Forest are listed for sediment in the Trout Creek Sub Basin.

Both action alternatives would comply with the Clean Water Act.

Executive Orders

11644 of February 8, 1972
Use of Off-road Vehicles on the Public Lands
As amended by Executive Order 11989 of May 24, 1977.

Executive Order (EO) 11644, as amended, provides direction for federal agencies to establish policies and procedures to control and direct the use of OHVs on public lands to: 1) protect the resource of those lands; 2) promote the safety of all users of those lands; and 3) minimize conflicts among various users of those lands. In response, the Forest Service developed regulations at 36 CFR 216, 219, and 295. Under these regulations OHV use can be restricted or prohibited to minimize: 1) damage to soil, watershed, vegetation, or other resources of the public lands; 2) harm to wildlife or wildlife habitats; or 3) conflicts between the use of OHVs and other types of recreation.

The Deschutes and Ochoco National Forests and Crooked River National Grassland have restricted motorized travel to designated routes in some areas since the late 1970s. As described under the Forest Plan Consistency section, the two Forests have also issued Travel Maps that defines travel opportunities and restrictions on Forest roads and trails. The Deschutes and Ochoco National Forest and Crooked River National Grassland.
Each of the action alternatives analyzed in this EIS makes substantial improvements in reducing and minimizing resource impacts and use conflicts as required by EO 11644.

11988 & 11990 of May 24, 1977
Protection of Floodplains and Wetlands

Executive Order 11988 requires the Forest Service to provide leadership and to take action to (1) minimize adverse impacts associated with occupancy and modification of floodplains and reduce risks of flood loss, (2) minimize impacts of floods on human safety, health, and welfare, and (3) restore and preserve the natural and beneficial values served by floodplains. Executive Order 11990 requires the Forest Service to take action to minimize destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

Hydrology: The Forest Service is proposing to reduce the amount of motorized access within the riparian influence zone in every alternative except Alternative 1, where motorized access would be allowed in areas currently open to motorized access off designated routes and allowed without changed conditions for motorized access for dispersed camping.

Aquatic Biota: Alternative 1 could result in an increase in impacts from motorized access within floodplain areas where floodplain areas are currently open to motorized access off designated routes and where motorized access for dispersed camping is not prohibited. Alternatives 2 and 3 would result in a decrease of impacts within floodplain areas, through the elimination of motorized access off designated routes and by modifying the conditions under which motorized access for dispersed camping would be allowed. Thus, all alternatives ultimately comply with the intent of Executive Order 11988.

All action alternatives would result in a decrease of impacts within floodplains, wetland and riparian areas, by prohibiting motorized access off designated routes and changing the conditions under which motorized access for dispersed camping is allowed. Thus, all alternatives ultimately comply with the intent of Executive Order 11990.

13186 of January 10, 2001, and the Migratory Bird Treaty Act
Responsibilities of Federal Agencies to Protect Migratory Birds

Executive Order 13186, signed January 10, 2001, directs federal agencies to protect migratory birds by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practical, adverse impacts on migratory birds' resources when conducting agency actions. This order directs agencies to further comply with the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and other pertinent statutes. This analysis is compliant with the National Memorandum of Understanding between the USDA Forest Service and the U.S. FWS to promote the conservation of migratory birds (USDA 2008g).

13443 of August 16, 2007
Facilitation of Hunting Heritage and Wildlife Conservation

This order directs federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

This DEIS and the associated specialist reports have considered the management of wildlife habitats trends in and effects on hunting opportunities, and economic and recreational values of hunting. Resource specialists have considered the programs and plans of other state and federal wildlife agencies, have worked collaboratively with them in their professional roles, and have coordinated with them in development of this travel management plan. These other agencies have been kept abreast of these proposed actions. The Deschutes and Ochoco National Forests currently have in place various cooperative seasonal motorized use closures, including winter range motorized closure areas and the so-called "Green Dot" hunting season road closures. These concepts have been adopted year-round in the proposed actions. Alternatives 2 and 3 incorporate seasonal use periods for routes established by these cooperative agreements and prohibit motorized access off designated routes except where motorized access for dispersed camping is allowed within 300' of open designated routes. According to comments received during scoping on this and other projects, Oregon Department of Fish and Wildlife supports prohibiting motorized access off designated routes.

12898 of February 11, 1994

Environmental Justice in Minority Populations and Low-income Populations

Executive Order 12898 directs the agency to identify and address, "...as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations...." The intent of the order is to assure the fair treatment and meaningful involvement and consideration of all people. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from the execution of a federal actions. Outreach and public involvement for this project has been extensive and at various scales within various communities of interest. This included meeting individually with tribal staff and members of the Cultural and Heritage Committee for the Confederated Tribes of the Warm Springs, as well as including the tribal newspaper and radio station in news releases prior to all of our public meetings, and with periodic updates as the planning process progressed. A similar outreach effort was made with local Hispanic radio and news media outlets. Flyers and posters were distributed in all local communities prior to public meetings to reach all members of the local communities. As a result of these outreach and scoping (public involvement) processes, there were no potentially disproportionately high and adverse human-health, environmental, or social effects to minority or low-income populations identified. Based on the social and economic analysis presented in Chapter 3, there is no known potential for disparate or disproportionate effects on minority or low-income populations.

USDA Civil Rights Policy

The Civil Rights Policy for the USDA, Departmental Regulation 4300-4 dated May 30, 2003, states that the following are among the civil rights strategic goals; (1) managers, supervisors, and other employees are held accountable for ensuring that USDA customers are treated fairly and equitably, with dignity and respect; and (2) equal access is assured and equal treatment is provided in the delivery of USDA programs and services for all customers. This is the standard for service to all customers regardless of race, sex, national origin, age, or disabilities.

Disparate impact, a theory of discrimination, has been applied to the travel management planning process in order to reveal any such negative effects that may unfairly and inequitably impact beneficiaries regarding program development, administration, and delivery.[89] The objectives of this review and analysis are to prevent disparate treatment and minimize discrimination against minorities, women and persons with disabilities and to ensure compliance with all civil rights statutes, Federal regulations, and USDA policies and procedures.

Persons with Disabilities

Some comments received during the travel management planning process expressed concern that changes to motorized access would prevent future access to National Forest system lands for those with disabilities. In response to these comments, note that a review of the project alternatives has been conducted to ensure that they apply equally to all groups. Therefore, the travel management plan is not discriminatory towards persons with disabilities, because it applies equally to all groups.

Under section 504 of the Rehabilitation Act of 1973, no person with a disability can be denied participation in a Federal program that is available to all other people solely because of his or her disability. There is no legal requirement to allow people with disabilities use of motor vehicles on roads, trails, or other areas that are closed to motor vehicles. Restrictions on motor vehicle use that are applied consistently to everyone are not discriminatory. A more detailed description of the study area demographics is included in the Social and Economic section of Chapter 3.

[89] For more information on disparate impact theory, see The Evolution of Disparate Impact Theory of Discrimination, *Harvard Journal of Legislation, vol. 44 2007* (http://www.law.harvard.edu/students/orgs/jol/vol44_2/gordon.pdf)

Civil Rights Monitoring and Evaluation

It is the responsibility of the Deputy Chiefs for National Forest Systems to ensure that decision-makers are aware of this Civil Rights Impacts Analysis and that the alternatives and mitigations are considered. Any future travel management projects will be implemented only after an appropriate level of NEPA is completed and the decision documented. This project-level NEPA will be completed with adequate public involvement that will consider access and concerns from minorities, women, persons with disabilities, and low income populations. Continue to consult early and often with Oregon Tribal Governments regarding Special Areas of Historic Tribal Significance for implementation of travel management plans.

Continue to design travel management planning and public involvement opportunities that consider access concerns from minorities, women, persons with disabilities, and low income populations.

Determination that a CRIA is not needed

On May 16, 2008, the Deschutes and Ochoco National Forests embarked on a proposed action to improve management of motorized vehicle use on NFS lands within the Deschutes and Ochoco National Forests in accordance with regulations at 36 CFR Parts 121, 251, 261, and 295, and as described in Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule (2005).
The Notice of Intent (NOI) initiating the scoping process was published in the Federal Register on May 16, 2008.

A summary of the comments received during the scoping process, the issues raised, and how they were addressed related to this EIS are included in Chapter 1. A comprehensive description of the community collaboration used to help develop the proposed action is also available on our website (http://www.fs.fed.us/r6/centraloregon/travel-mgmt/index-projdocs-06-08.shtml) People have self-selected to participate in the public meetings, and to provide written comments and were not required to provide any information concerning individual demographic information.

Groups and classes of persons have been reviewed within the social analysis section of the EIS. No groups or classes or persons were found to be disproportionately negatively affected by this travel management decision. This travel management decision applies equally to all members of the public, and therefore is not discriminatory to any person or group.

CHAPTER 4. CONSULTATION AND COORDINATION

Preparers and Contributors

The project development phase was a collaborative effort involving many individuals representing Federal, State, and local agencies. The following sections will list those involved in the consultation and coordination process of the project. The Interdisciplinary Team member section will name all specialists involved in the preparation process of this DEIS and describe the education and experience of each member. Also listed below are the Provincial Advisory Committee and Working Group members who were first chartered for developing the strategy for implementing the rule.

INTERDISCIPLINARY TEAM MEMBERS

Mollie Chaudet, USDA Forest Service, Deschutes National Forest, Supervisor's Office,

Position/Contribution: Project Manager; Social and Economic Impact Analysis

Education: A.S., Forest Technology, Central Oregon Community College

Experience: 30 years of experience with the Forest Service and BLM. Forest Litigation Coordinator 2005-present; Associate Area Manager; Supervisory Interdisciplinary Planner; 2000-2005; Environmental Coordinator and National Environmental Analysis Instructor, 1990-2000; Project Planner, 1982-1989. Timber Sale Preparation 1978-1981

Peggy Fisher, PE; USDA Forest Service, Deschutes National Forest, Supervisor's Office

Position/Contribution: Transportation Program Manager/Project Manager

Education: M.S., Civil Engineering, Oregon State University

Experience: 8 years with the Forest Service as Transportation Program Manager, Deschutes/Ochoco National Forests; One year as Project Team Leader, Deschutes National Forest, 8 years as Geotechnical Engineer, Ochoco National Forest; and 3 years as Geotechnical Engineer, Willamette National Forest

Laurel Skelton, USDA Forest Service, Ochoco National Forest, Supervisor's Office,

Position/Contribution: Recreation Planner

Education: B.S., Forestry and Recreation Planning, Oregon State University

Experience: 4 years with the Ochoco & Deschutes National Forest working on special projects, including Travel Management. 7 years with the Ochoco NF as Recreation Program Manager, seven years with the Crooked River National Grassland as District Recreation and Special Uses Program Manager, 3 years on the Mt. Hood National Forest, and 1 year on the Winema National Forest as program lead for developed, dispersed, wilderness and trails programs.

Mose Harris IV, USDA Forest Service, Deschutes National Forest, Supervisor's Office, Planner

Position/Contribution: Writer-editor

Education: B.S., Environmental Science, Tuskegee University, 2005

Experience: 4 years permanently with the US Forest Service, Deschutes National Forest. Seasonal work since 2000 including positions in Silviculture, Fire/Fuels, and Planning.

Bruce Wright, USDA Forest Service, Deschutes National Forest, Supervisor's Office,

Position/Contribution: GIS Analyst

Education: B.S., Electrical Engineering

Experience: Forest Service Geographic Information Systems 1991-present, Wildland fire suppression 1986-1991, Outside Plant Engineer United Telephone 1978-1986, Smokejumper Redmond Air Center 1971-1978, Hotshot Redmond Air Center 1970.

Caroline Gordon, USDA Forest Service, Ochoco National Forest, Supervisor's Office,

Position/Contribution: Geologist

Education: B.A., Geology, Central Washington University, 1977, Ellensburg, WA

Experience: 16 years with the Forest Service as Forest Geologist, Ochoco National Forest/Crooked River National Grassland; 5 years as geologist, Siuslaw National Forest; and 3 years as a geologist, Coconino National Forest in Arizona.

Peter Sussmann, USDA Forest Service, Deschutes National Forest, Supervisor's Office,

Position/Contribution: Soil Scientist

Education: B.S., Agronomy/Soils University of Illinois, 1986

Experience: USDA Forest Service Soil Scientist, Deschutes National Forest, 1992-1998. Field Soil Scientist, Interagency Riparian Classification, 200-2002. Soil Scientist, Deschutes National Forest, 2002-2004.

Christopher Yamasaki, USDA Forest Service, DRM, Deschutes National Forest, Supervisor's Office,

Position/Contribution: GIS/Data Services Specialist, Geospatial Datasets and Map Products

Education: B.S., Environmental Science, University of Oregon, Professional GIS Certificate, Certificate in GIS Application Programming, Central Oregon Community College.

Experience: 2 years with the Forest Service as a GIS/Data Services Specialist, Deschutes/Ochoco National Forests, and five years as a seasonal Fisheries Tech in Oregon, Southeast Alaska, and California.

Dorothy Thomas, USDA Forest Service, Deschutes National Forest, Supervisor's Office,

Position/Contribution: GIS Coordinator, Creation of polygon maps and data queries for project analysis and geodatabase data

Education: A.A., Geographic Information Systems, Central Oregon CC, 1996. B.S. Environmental Sciences: Natural Resource Management, Oregon State University, 2000.

Experience: 11 years professional experience in GIS systems

James Seymour, USDA Forest Service, Ochoco National Forest, Supervisor's Office,

Position/Contribution: Hydrologist

Education: B.S., Watershed Science (concentration in hydrology), Colorado State University, 1980

Experience: 29 years experience with the Forest Service in hydrology, planning, and water quality monitoring

Katie Grenier, USDA Forest Service, Deschutes National Forest, Supervisor's Office,

Position/Contribution: Botanist, Native Plant and Invasive Species

Education: M.S., Biology in Botany, Humboldt State University

Experience: 10 years with the Forest Service as Botany Program Manager, Deschutes/Ochoco National Forests; 5 years as Botany Program Manager, Siuslaw National Forest; and 9 years as a seasonal botanist in Wyoming, Idaho, Utah, and California

Lauren Miller, USDA Forest Service, COFMS (Central Oregon Fire Management Services- serves Deschutes NF , Ochoco NF, and Prineville BLM), Deschutes National Forest, Supervisor's Office,

Position/Contribution: Fire and Fuels Planning Support / Fire, Vegetation Management, and Air Quality

Education: B.S., Resource Ecology and Management, University of Michigan; M.S., Forestry, University of Idaho

Experience: Experience: <1 year with the Forest Service supporting Fire and Fuels Planning, COFMS; 2 years with the Forest Service as Fire Ecologist, Uinta-Wastach-Cache National Forests; 3 years with the Forest Service in Student Career Experience Program for Fire Ecology, Wenatchee-Okanogan NF and Adaptive Management Services Enterprise Team, Tahoe National Forest; 1 year with the State of Arizona, Ecological Restoration Institute as a Research Technician; and 1 year with the US Geological Survey as a biological science technician at the Sequoia & Kings Canyon National Park and Las Vegas Field Stations

Dan Rife, USDA Forest Service, Deschutes National Forest, Supervisor's Office,

Position/Contribution: Fisheries Biologist

Education: B.S., Fisheries Biology, Humboldt State University, CA

Experience: 25 years of experience with the Forest Service. Forest Fisheries Program Manager - Deschutes and Ochoco NF, 2000-present; District Fisheries Biologist, Wenatchee NF, 1991-2000; Assistant District Fisheries Biologist, Wentachee NF, 1989-1991; Assistant District Fisheries Biologist, Mt. Hood NF, 1986-1989; Stream Surveyor, Mt. Hood National Forest, 1984-1985.

Lauri Turner, USDA Forest Service, Deschutes National Forest, Supervisor's Office,

Position/Contribution: Wildlife Biologist

Education: B.S., Biology with a Wildlife Emphasis, Kearney State College, Kearney, NE 1989

Experience: Forest Wildlife Biologist, Deschutes NF since 2005. District Wildlife Biologist, Deschutes NF 1998-2005. Wildlife Biologist, Willamette NF 1991-1998. Biological Technician, Willamette NF 1990. Working as a professional Wildlife Biologist for 19 years, Willamette and Deschutes National Forests.

Paul Claeyssens, USDA Forest Service, WO Enterprise Program, Heritage Stewardship Group, Bend, OR

Position/Contribution: Heritage Resource Specialist; Archaeological, Historic and Tribal Resources

Education: BA, Anthropology, University of California, San Diego; MS, Anthropology, University of Oregon

Experience: 1 year as a Forest Service WO Enterprise Program business unit lead for a unit offering historic preservation services, 19 years with the Forest Service as a heritage program manager on the Ochoco and Deschutes National Forests, 8 years as a district archaeologist on the Willamette National Forest, and 2 years as a research technician, teaching assistant and field archaeologist on university and private sector heritage projects.

Patrick Nelson, USDA Forest Service, Deschutes National Forest, Supervisor's Office,

Position/Contribution: Cartographic Technician Student Temporary Employment Program (STEP)

Education: A.A.S., Geographic Information Systems Central Oregon Community College Bend, OR BS Geographic Information Science (to be completed Dec. 2009) Northern Arizona University Flagstaff, AZ

Experience: 3 years professional GIS experience between the FS, BLM, and nonprofit environmental organizations

Rick Collins, P.E., USDA Forest Service, Deschutes and Ochoco National Forests, Deschutes NF Supervisor's Office,

Position/Contribution: Forest Road Manager and Transportation Planner / Transportation Planning & Analysis

Education: M.S., Civil Engineering, Oregon State University. B.S. Forest Engineering, Oregon State University

Experience: 23 years with the Forest Service in Transportation Planning and Road Management.

Sarah Barnett, USDA Forest Service, Deschutes National Forest, Supervisor's Office,

Position/Contribution: Civil Engineer Tech, Travel Routes/Data Management

Education: B.S., Interdisciplinary Studies

Experience: Over 10 years of Information Technology experience and working with Data Management.

Steve Gibson, USDA Forest Service, Ochoco National Forest, Supervisor's Office,

Position/Contribution: Range Management Specialist

Education: A.A., Biological Science, Central Oregon Community College; B.A., Rangeland Science, Oregon State University

Experience: 14 years ranch experience, 19 years Forest Service experience. Acting Forest Range Program Manager, 2009; National Grassland Natural Resource Team Leader, 2004 - present; Zone Supervisory Range Management Specialist, 1999 - 2004; Acting Forest Range Program Manager, 2000; Range Management Specialist/Resource Assistant, 1992 - 1999; Range Management Specialist/Minerals Technician, 1991 - 1992; Range Technician/Range Conservationist, 1990 - 1991.

Mark Christiansen, USDA Forest Service, Deschutes National Forest, Supervisor's Office,

Position/Contribution: Recreation Program Manager

Education: B.S., Forest Management, Northern Arizona University, 1975

Experience: 34 years Forest service experience. Timber Sale Administration, Recreation, Lands, & Minerals, Tongass NF, 1976 – 1980; Timber Sale Preparation & Administration, Gallatin NF, 1980 – 1983; Recreation Program Manager, Gallatin NF, 1984 – 1988; Recreation Staff, Toiyabe NF, 1989 – 1991; Recreation Staff, Arapaho Roosevelt NF, 1992 – 1999; Forest Recreation Program Manager, Deschutes NF, 1999 – present.

Vicki Ramming, USDA Forest Service, Deschutes National Forest, Supervisor's Office,

Position/Contribution: Program Manager Central Oregon OHV Operations (COHVOPS)

Experience: 30 years of experience with the Forest Service. COHVOPS Program Manager 2005-present; Special Use Permit Administrator 1995-2005; Recreation Manager 1991-1995; Timber Sale Administrator 1988-1991; Timber Sale Appraiser 1980 - 1988; Dispatcher 1978-1980

Paul C. Cuddy, USDA Forest Service, Ochoco National Forest, Supervisor's Office,

Position/Contribution: Forest Environmental Coordinator/Planner

Education: B.S., Social Sciences, Providence College; M.S., Forest Management, Utah State University

Experience: 32 years of Forest Service experience; Salmon, Wasatch-Cache, Bridger-Teton, Siskiyou, and Ochoco National Forests.

Gery Ferguson, USDA Forest Service, Deschutes National Forest, Supervisor's Office,

Position/Contribution: Assistant Forest Planner

Education: B.S., Wildlife, Michigan State University

Experience: 28 years of Forest Service experience; Colville, Umpqua, Ochoco and Deschutes National Forests

Ken Kittrell, USDA Forest Service, Deschutes National Forest, Crescent Ranger District

Position/Contribution: District Engineer

Education: B.S., Fisheries Biology, University of Idaho

Experience: 32 years of Forest Service experience; Engineering Survey Technician, Nezperce NF, 1974 – 1978; Project Engineer, Gifford Pinchot, Willamette, and Malheur NF, 1979 – 1994; District Watershed Specialist/Transportation Plannner, Malheur NF, Winema NF, 1994 – 2000; District Engineer, Deschutes NF, 2000- present

Rob Tanner, USDA Forest Service, Deschutes and Ochoco National Forests, Supervisor's Office

Position/Contribution: Hydrologist

Education: B.S., Environmental Studies and General Science, University of Oregon; M.S., Hydrology, Oregon State University

Experience: 2 years hydrology work with Eugene BLM. 9 years as a hydrologist for the Deschutes and Ochoco NF with support to the Crooked River and Upper Deschutes Watershed Councils.

FEDERAL, STATE, AND LOCAL AGENCIES

The Deschutes and Ochoco National Forests worked with a chartered federal advisory committee to develop a strategy for implementing the rule. Their recommendations were used to lay the framework for how the proposed action would be developed. The members of the Provincial Advisory Committee are listed in Table 4-1, and the members of the Travel Management Working Group are listed in Table 4-2

Table 4-1 Deschutes Provincial Advisory Committee (PAC)

Name	Organization
John Allen	**Designated Official, Deschutes Forest Supervisor**
Glen Ardt*	**Habitat Biologist, Oregon Department of Fish and Wildlife**
Chuck Burley	**Forest Products Industry - American Forest Resource Council, State Representative**
Dennis Carlson	**“At Large”, Hood River County Forestry Dept.**
Roy Epperson*	**Crook County Natural Resources Committee**
Garth Fuller	**Environmental Advocacy, The Nature Conservancy, Eastern Oregon Director**
Don Gentry	**Klamath Tribe**
Nancy Gilbert*	**US Fish and Wildlife Service**
Peter Gutowsky*	**Deschutes County – Senior Planner**
Teresa Kubo	**Environmental Protection Agency**
Bonnie Lamb	**Oregon Department of Environmental Quality**

James Larsen*	**“At Large” Homeowner**
Tim Lillebo*	**Environmental Advocacy - Oregon Wild**
Kreg Lindberg*	**Recreation and Tourism – Oregon State University Associate Professor**
Dave McClain	**“At Large”, Private Consultant**
Chuck McGrath	**Grazing permittee**
John Morgan*	**Forest Products Industry – resource manager for Ochoco Lumber Co.**
Dennis Oliphant*	**Recreation and Tourism - Sun Country Tours, Inc**
Clay Penhollow*	**Confederated Tribes of the Warm Springs Reservation of Oregon – Natural Resources Department**
Name	Organization
George Ponte	**Oregon Department of Forestry**
Boyd Wickman*	**Scientist Emeritus, US Forest Service Research, Pringle Falls Experimental Forest**

* Denotes member of the Deschutes Provincial Travel Management Subcommittee.

Table 4-2 Deschutes Provincial Advisory Committee Travel Management Subcommittee and Working Group.

Name	Interest
Kate Beardsley	Equestrian
Bruce Bowen	Non-Motorized Recreation- Hiker/Mtn. Biker
Steve Doane	Small Business Owner
Tim Van Domelen	Ranger, OR Hunters Assoc.
Joani Dufourd	Motorized Recreation
Bob Flint	Motorized Recreation- Class I & III
Margie Gregory	Oregon Equestrian Trails
Tom Landis	Non-Governmental Organization, Friends of the Metolius
Marilyn Miller	Juniper Group, Sierra Club
Ron Ore	Small Business Owner- Motorized Rec.
Ed Putnam	Non-Motorized, Recreation-Bow Hunting
Jon & Patti Pyland	Motorized Recreation- Class II
Jesse Rudelitsch	Central Oregon Rocks, Inc.
Eric Sorenson	Central Oregon Rocks, Inc.
John Wainwright	Equestrian

The Deschutes and Ochoco National Forests has given several presentations on the Travel Management Rule to various groups at several different venues. Comments received along with issues and concerns raised from these groups were then incorporated into the information provided from the public to our chartered federal advisory committee and the Internal Interdiscipinary Team. These comments, issues and concerns were then used to develop a strategy for implementing the rule. These recommendations were used to lay the framework for how the proposed action would be developed and modified. These various presentations and groups have been listed below.

Oregon Hunters Association

Oregon Bow Hunters

Oregon Equestrian Club

Citizens of Crescent Junction

Central Oregon Motorcycle & ATV Club

Ochoco Trail Riders

Deschutes County 4-Wheelers

Crescent Community Action Team

Crook County Natural Resource Committee

Klamath County Commissioners

Quiet Recreation Summit in Idaho

Willamette National Forest – Eugene Public Meeting

Mt Hood National Forest – Public Meeting

2006 thru 2008 – Deschutes County Fair

2006 thru 2009 Central Oregon Sportsman Show

2006 Central Oregon Public Workshop Series – Forest Service Lead

2007 Central Oregon Public Workshop Series – Forest Service Lead

2008 Central Oregon Public Workshop Series – Forest Service Lead

OTHERS

TRIBES:

Traditional Cultural Sites, Tribal Relations, and Treaty Rights

Traditional cultural properties (TCPs) are a type of historic site reviewed under the NHPA, as well as other tribal legislation and policy. Traditional cultural properties are defined as cultural resource sites that are significant for the role they play in a living culture or community's historically rooted beliefs, customs, religion or cultural practices (National Register Bulletin 38). Traditional cultural properties represent a linkage of lifeway values that connect the landscape to a group by continued and 'traditional' use.

American Indians and Alaska Natives are recognized as people with distinct cultures and traditional values. They have a special and unique legal and political relationship with the Government of the United States as defined by history, treaties, statutes, executive orders, court decisions, and the U.S. Constitution. It is the policy of the U.S. Government to implement programs in ways that are knowledgeable and respectful of, and sensitive to Tribal sovereignty (Clinton 1994). There is an emphasis on government-to-government relationships with *federally-recognized* tribes, including consultation in order to identify rights and concerns during the development of plans, projects, programs and activities (USDA Forest Service 1997).

The Forest Service also consults with non-federally recognized tribes, organizations, and individuals. These groups may have many of the same concerns or issues as federally recognized groups, but do not enjoy the same legal status or required agency protocol.

Tribal governments have considerable powers that are usually separate from State and local governments. Individual treaties, statutes--such as the American Indian Religious Freedom Act (AIRFA), and executive orders—such as those addressing sacred sites or tribal consultation--often reserve specific rights and/or address traditional interests relative to the use of federal lands. Reserved resource rights and privileges associated with treaties and other Indian agreements generally include activities such as hunting, fishing, grazing, subsistence, access to and the gathering of forest resources. In addition, land and resources hold a special and unique meaning in the spiritual and everyday lifeways of many Indians. National Forest lands and resources represent cultural and sometimes economic values to Indian people. Federally recognized Tribes and other Indian groups often look to the National Forests for traditional resource, religious, and contemporary uses, and as part of their ancestral homeland.

The Deschutes and Ochoco National Forests, including the Crooked River National Grassland maintain tribal relations with the following: Confederated Tribes of the Warm Springs Reservation of Oregon, The Burn Paiute Tribe and the Klamath Tribes. In general all cultural resources are of interest to the tribes as well as areas on public lands were traditional activities take place such as gathering of wild foods and other forest resources, including game and fish. The Confederated Tribes of Warm Springs have ceded land rights granted under The Treaty of Middle Oregon 1855 (Treaty of Wasco, Columbia River, Oregon Territory with the Taih, Wyam, Tenino, & Dock-Spus Bands of the Walla-Walla, and the Dalles, Ki-Gal-Twal-La, and the Dog River Bands of the Wasco, June 25, 1855, 12 Stat., 963., Ratified Mar. 8, 1859, Proclaimed Apr. 18, 1859) covering parts of the Deschutes and Ochoco National Forests and the Crooked River National Grassland, which convey to them the right to exercise their treaty rights on public lands in common with other citizens. The Burns Paiute and Klamath Tribes also exercise such practices on their traditional territories including lands and resources of the two Forests. In addition pictograph sites are known to be a type of site that is “sensitive” to Indian Tribes. These sites may or may not be indicative of traditional use, and are abundant in certain drainages of the analysis area. The pictograph sites are addressed as archaeological sites elsewhere in this document (Chapter 3).

Indian Treaties and portions of the Indian Claims Commission map covering Oregon indicate that only “reserved resource rights” (e.g., treaty rights) exist for the Confederated Tribes of the Warm Springs Reservation.

These three tribes, the Confederated Tribes of the Warm Springs Reservation of Oregon, The Burn Paiute Tribe and the Klamath Tribes are within the ‘sphere of influence’ for the Travel Plan analysis and were contacted during the initial stages of planning (need more specifics about Warm Springs involvement with the group). Tribal members were informed of the different public scoping meetings through various public announcements. The tribes received hard copies of the DEIS when it was released and they received an update letter on May 20, 2009. No written comments or responses were received from the tribes.

Based on information supplied during the initial travel planning by the Deschutes and Ochoco National Forests and special interest groups, the Confederated Tribes of the Warm Springs Reservation was acknowledged as having an interest in Travel Management Planning, its effects on the landscape and/or

locations for their traditional practices. Forest Service representatives (Line Officer and Heritage Staff) personally contacted the appropriate tribal cultural resource delegate, both by phone and through personal visitation at the Tribal Offices. No concerns were brought forward by the Confederated Tribes of the Warm Springs Reservation.

Distribution of the Draft Environmental Impact Statement

The Forest Service will be distributing this document to given the opportunity to commentith or received project comments from the following individuals, agencies, tribes, and non-Forest Service persons during the development of the draft environmental impact statement.

FEDERAL, STATE, LOCAL AGENCIES AND INDIVIDUALS

State Government

Oregon Department of Fish and Wildlife

Federal Agencies

US Environmental Protection Agency

US Fish and Wildlife Service

Advisory Council on Historic Preservation

Office of Civil Rights

National Marine Fisheries Service

U.S. Air Force

Army Corps of Engineers

U.S. Navy

U.S. Army

U.S. Department of the Interior

Federal Highway Administration

Tribes

Confederated Tribes of the Warm Springs Reservation of Oregon

The Burn Paiute Tribe

The Klamath Tribes

OTHERS

A complete list of all individuals that have commented on this project is available upon request.

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GLOSSARY

Access Management. Management of the ingress and egress of people on National Forest System lands. Generally used to describe motorized use allowed.

Access Rights. A privilege or right of a person or entity to pass over or use another person's or entity's travel way. (36 CFR 212.1, FSM 5460.5 – Rights of Way Acquisition, FSM 7700 – Transportation System)

Activity – a measure, course of action, or treatment that is undertaken to directly or indirectly produce, enhance, or maintain forest and rangeland outputs or achieve administrative or environmental quality objectives (Deschutes LRMP)

Adaptive Management. A type of natural resource management that implies making decisions as part of an on-going process. Monitoring the results of actions will provide flow of information that may indicate the need to change a course of action. Scientific findings and the needs of society may also indicate the need to adapt resource management to new information.

Administrative unit. A National Forest, a National Grassland, a purchase unit, a land utilization project, Columbia River Gorge National Scenic Area, Land Between the Lakes, Lake Tahoe Basin Management Unit, Midewin National Tallgrass Prairie, or other comparable unit of the National Forest System. (Such as a Ranger District)

Administrative Use. Motorized use of a road, trail, or area for limited administrative use by the Forest Service; Use of any fire, military, emergency, or law enforcement vehicle for emergency purposes; Authorized use of any combat or combat support vehicle for national defense purposes; Law enforcement response to violations of law, including pursuit; and, Permitted Use and occupancy of National Forest System lands. (USDA-Forest Service. 2004. 36 CFR Part 212, 251, 261, and 295. Travel Management; Designated Routes and Areas for Motor Vehicle Use.)

Affected Environment. The natural environment that exists at the present time in an area being analyzed.

Air Shed. A geographical area that, because of topography, meteorology, and climate, shares the same air.

All Terrain Vehicle (ATV) - Any motorized, off-highway vehicle 50 inches or less in width, having a dry weight of 600 pounds or less that travels on three or more low-pressure tires with a seat designed to be straddled by the operator. Low-pressure tires are 6 inches or more in width and designed for use on wheel rim diameters of 12 inches or less, utilizing an operating pressure of 10 pounds per square inch (psi) or less as recommended by the vehicle manufacturer (FSH 2309.18). In this document the term ***ATV trail*** is often used to discuss a motorized trail that can be used for motorcycles also.

The Forest Service does not classify as ATVs the new “golf cart” sized light off-road utility vehicles as they usually have a wider track and overall length than ATVs.

Allotment (Range Allotment). The area designated for use by a prescribed number of livestock for a prescribed period of time. Though an entire Ranger District may be divided into allotments, all land will not be grazed, because other uses, such as recreation or tree plantings, may be more important at a given time.

Alternative. One of several policies, plans, or projects proposed for decision-making.

Analysis Area. See "Regional Analysis Area."

Animal Unit Month (AUM). The amount of forage required by one calf and her cow or 1 horse or 5 sheep for one month.

Annual Maintenance. Work performed to maintain serviceability, or repair failures during the year in which they occur. Includes preventive and/or cyclic maintenance performed in the year in which it is scheduled to occur. Unscheduled or catastrophic failures of components or assets may need to be repaired as a part of annual maintenance. (Financial Health – Common Definitions for Maintenance and Construction Terms, July 22, 1998)

Aquatic Ecosystem. The stream channel, lake or estuary bed, water, biotic communities and the habitat features that occur therein.

Aquatic Habitat Types. The classification of instream habitat based on location within channel, patterns of water flow, and nature of flow controlling structures. Riffles are divided into three habitat types: low gradient riffles, rapids, and cascades. Pools are divided into seven types: secondary channel pools, backward pools, trench pools, plunge pools, lateral scour pools, dammed pools, and beaver ponds. Glides possess attributes of both riffles and pools and are characterized by moderately shallow water with an even flow that lacks pronounced turbulence.

Aquatic Influence Zone. Used in the context of a land management prescription, the area encompassing aquatic and riparian ecosystems and adjacent lands which directly affect the hydrologic, geomorphic, and ecological processes, controlling aquatic and riparian ecosystem health and function.

Archaeological. A term used to describe any cultural resources deposited on or in soil strata from past human activity. However, these cultural deposits generally must be at least 50 years old to be considered archaeological.

Area. A discrete, specifically delineated space that is smaller, and in most cases much smaller, than a Ranger District.

Arterial Road. A forest road that provides service to large land areas and usually connects with other arterial roads or public highways. (FSH 7709.54 - Forest Transportation Terminology Handbook, no longer in print)

Big Game. Those species of large mammals normally managed for sport hunting.

Bio-accumulation. The process whereby living plants or animals incorporate a substance into their tissues, thus introducing the substance into the food chain. Often refers to hazardous substances.

Biological Control. The use of natural means to control unwanted pests. Examples include introduced or naturally occurring predators such as wasps, or hormones that inhibit the reproduction of pests. Biological controls can sometimes be alternatives to mechanical or chemical means.

Biological Diversity. The number and abundance of species found within a common environment. This includes the variety of genes, species, ecosystems and ecological processes that connect everything in a common environment.

Biological Growth-Potential. The average net growth attainable in a fully stocked natural forest stand.

Biological Potential. The maximum possible resource output limited only by inherent physical and biological characteristics.

Biota. The plant and animal life of a particular region.

BMP (Best Management Practices). Practices designed to prevent or reduce water pollution. Also referred to as Soil and Water Conservation Practices (SWCPs).

Borrow Source. An area from which sand, gravel, or stone is taken for use in another area.

Bridge. A road or trail structure, including supports, erected over a depression or obstruction such as water, a road, trail or railway and having a deck for carrying traffic or other loads.

Buffer. A land area that is designated to block or absorb unwanted impacts to the area beyond the buffer. Buffer strips along a trail could block views that may be undesirable. Buffers may be set aside next to wildlife habitat to reduce abrupt change to habitat.

Capability. The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils and geology, as well as the application of management practices, such as silviculture or protection from fire, insects and disease.

Capital Improvement. The construction, installation, or assembly of a new fixed asset, or the significant alteration, expansion, or extension of an existing fixed asset to accommodate a change of purpose. (Financial Health – Common Definitions for Maintenance and Construction Terms, July 22, 1998)

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Capture (input). One of the ways functions are described; resources (organisms, materials, and energy) brought into the system (i.e., photosynthesis, migration, onto summer range, pollution brought in by wind or water.)

Channel Depth. The average depth of channel from mean high water mark to mean high water mark used to define stream type, instream flow calculations and riparian management.

Channel Gradient. The slope of the stream channel expressed on a percent of rise per unit length. A measure of the drop in water surface elevation per unit length of channel. The difference in water surface or streambed elevation of two study sites on a stream divided by the distance between the study sites.

Channel Roughness. A measurement used to determine energy losses and velocities of natural stream channels by using water energy slope (channel slope), velocity and hydraulic radius.

Channel Stability Rating. A rating of stream channels resistance capacity to the detachment of bed and bank materials.

Chemical Control. The use of pesticides and herbicides to control pests and undesirable plant species.

Classified Road. Road wholly or partially within or adjacent to National Forest System lands that are determined to be needed for long-term motor

vehicle access, including State roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service that is designated for motor vehicle use pursuant to 36 CFR 212.51 on a Motor Vehicle Use Map (MVUM). (36 CFR 212.1, FSM 7705 – Transportation System). A road under Forest Service jurisdiction.

Clean Air Act. (42 U.S.C. 7609) Section 309 provides authority for the Environmental Protection Agency to review other agency environmental impact statements.

Closed Road. Roads on the Forest Transportation system available for motorized administrative or emergency use, but not open to public motorized use. Also called long-term intermittent and is classified as a Level 1 maintenance road. . (Local definition by Ogden Ranger District used for clarity in communication with this analysis.)

Collector Road. A forest road that serves smaller land areas than an arterial road. Usually connects forest arterial roads to local forest roads or terminal. (FSH 7709.54 – Forest Transportation Terminology Handbook, no longer in print)

Concentrated Use Area. An area identified by the Forest Service characterized by recurring frequent and relatively dense dispersed recreation and where some continuing site impacts have been recorded. Concentrated Use Areas are inventoried and monitored by the Wasatch-Cache National Forest. Sites of this type may need specific site management plans, law enforcement patrolling, or some site-hardening (gravel, pavement, site management signing, or trash removal) to keep sites within acceptable standards. (Local definition by Ogden Ranger District used for clarity in communication with this analysis.)

Concern. (Also management concern.) An issue, problem or condition which constrains the range of management practices identified by the Forest Service in the planning process.

Connectivity (of habitats). The linkage of similar but separated vegetation stands by patches, corridors or "stepping stones" of like vegetation. This term can also refer to the degree to which similar habitats are linked.

Construction (new). The erection, construction, installation, or assembly of a new fixed asset. (Financial Health – Common Definitions for Maintenance and Construction Terms, July 22, 1998)

Corridor. Elements of the landscape that connect similar areas. Streamside vegetation may create a corridor of willows and hardwoods between meadows where wildlife feed.

Cost-efficiency. The usefulness of specified inputs (costs) to produce specified outputs (benefits). In measuring cost efficiency, some outputs, including environmental, economic, or social impacts, are not assigned monetary values but are achieved at specified levels in the least cost manner. Cost efficiency is usually measured using present net value, although use of benefit-cost ratios and rates-of return

may be appropriate.

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Council of Environmental Quality (CEQ). The Council issues regulations binding on all federal agencies, to implement the procedural provisions of the National Environmental Quality Act. The regulations address the administration of the NEPA process, including preparation of Environmental Impact Statements (EIS) for major federal actions which significantly affect the quality of the human environment.

Cover. Any feature that conceals wildlife or fish. Cover may be dead or live vegetation, boulders, or undercut streambanks. Animals use cover to escape from predators, rest or feed.

Critical Habitat. Areas designated for the survival and recovery of federally listed threatened or endangered species.

Critical Need. A requirement that addresses a serious threat to public health or safety, a natural resource, or the ability to carry out the mission of the organization. (Financial Health – Common Definitions for Maintenance and Construction Terms, July 22, 1998)

Cross-country Travel. Travel over terrain not on designated roads and/or trails.

Cultural Resource. An umbrella term used to describe a variety of resources, including archaeological or historic remains, folklore and oral traditions, and geographic areas traditionally ascribed to have historical significance to a given culture.

Cultural Sensitivity. Refers to the likelihood of encountering significant cultural volumes (quantity and/or quality) that may affect and may be affected by ground-disturbing activities.

Cumulative Effects or Impacts. The impact on the environment that results from the incremental impact of an action when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such other action. Cumulative effects or impacts can result from individually minor but collectively significant actions taking place over a period of time.

Decommission. Demolition, dismantling, removal, obliteration and/or disposal of a deteriorated or otherwise unneeded asset or component, including necessary cleanup work. This action eliminates the deferred maintenance needs for the fixed asset. Portions of an asset or component may remain if they do not cause problems nor require maintenance. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998)

Deferred Maintenance. Maintenance that was not performed when it should have been or when it was scheduled and which, therefore, was put off or delayed for a future period. When allowed to accumulate without limits or consideration of useful life, deferred maintenance leads to deterioration of performance, increased costs to repair, and decrease in asset value. Deferred maintenance needs may be categorized as critical or noncritical at any point in time. Continued deferral of noncritical maintenance will normally result in an increase in critical deferred maintenance. Code compliance (e.g. life safety, ADA, OSHA, environmental, etc.), Forest Plan Direction, Best Management Practices, Biological Evaluations other regulatory or Executive Order compliance requirements, or applicable standards not met on schedule are considered deferred maintenance. (Financial Health – Common Definitions for Maintenance and Construction Terms, July 22, 1998)

DEIS (Draft Environmental Impact Statement). The draft version of the Environmental Impact Statement that is released to the public and other agencies for review and comment.

Designated road, trail, or area. A National Forest System road, a National Forest System trail, or an area on National Forest System lands that is designated for motor vehicle use pursuant to § 212.51 on a motor vehicle use map.

Detrimental Soil Disturbance. Compacted, displaced, eroded or burned soil conditions incurred by management, recreational or natural activities that are capable of reducing the productivity of the soil resource.

Developed Recreation. Recreation that requires facilities that, in turn, result in concentrated use of the area. For example, skiing requires ski lifts, parking lots, buildings and roads. Campgrounds require roads, picnic tables and toilet facilities.

Dispersed Recreation. Recreation with few developed amenities such as structures, developed campsites, or toilets. Dispersed recreation is generally less directly constrained by management controls on movement or by enforcement activities, but must comply with posted orders or restrictions for areas under management. Dispersed campers, for instance, can choose to camp in places that are undeveloped, so long as they meet general posted rules for site protection. The term dispersed recreation usually implies lower visitor use densities. Dispersed recreation may be motorized or non-motorized. (Local definition by Ogden Ranger District used for clarity in communication with this analysis.)

Disturbance. Any event, such as a forest fire or insect infestation that alters the structure, composition, or function of an ecosystem.

Diversity. The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan. See also "Edge," "Horizontal Diversity," and "Vertical Diversity."

Ecological Type (Habitat Type). A category of land having a unique combination of potential natural community; soil, landscape, features, climate and differing from other ecological types in its ability to produce vegetation and respond to management. Used to define land capability.

Ecology. The interrelationships of living things to one another and to their environment, or the study of these interrelationships.

Ecosystem. An arrangement of living and non-living things and the forces that move among them. Living things include plants and animals. Non-living parts of ecosystems may be rocks and minerals. Weather and wildfire are two of the forces that act within ecosystems.

Ecosystem Management. The use of an ecological approach to achieve productive resource management by blending social, physical, economic and biological needs and values to provide healthy ecosystems.

Effects. Environmental consequences as a result of a proposed action. Included are direct effects, which are caused by the action and occur at the same time and place, and indirect effects, which are caused by the action and are later in time or further removed in distance, but which are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water

and other natural systems, including ecosystems.

Effects and impacts as used in this statement are synonymous. Effects include ecological (such as the effects on natural resources and on the components, structures and functioning of affected ecosystems), aesthetic quality, historic, cultural, economic, social or health whether direct, indirect or cumulative. Effects may also include those resulting from actions that may have both beneficial and detrimental effects; even if on balance the agency believes that the effects will be beneficial (40 CFR 1508.8).

Emergency Need. An urgent maintenance need that may result in injury, illness, or loss of life, natural resource, or property; and must be satisfied immediately. Emergency needs generally require a declaration of emergency or disaster, or a finding by a line officer that an emergency

exists. (Financial Health – Common Definitions for Maintenance and Construction Terms, July 22, 1998)

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Endangered Species. Any species of animal or plant that is in danger of extinction throughout all or a significant portion of its range. Plant or animal species identified by the Secretary of the Interior and endangered in accordance with the 1973 Endangered Species Act.

Endangered Species Act. The Act which requires consultation with U.S. Fish and Wildlife Service if practices on National Forest System lands may impact a threatened or endangered species (plant or animal).

Engineering Analysis. An analysis and evaluation conducted by a qualified engineer or under the supervision of a qualified engineer of an NFS road, road segment, or road system being considered for motorized mixed use. The analysis and evaluation may include recommended mitigation measures. The analysis may be simply documentation of engineering judgment or may be a more complex engineering report that includes many factors related to motorized mixed use.

Engineering Judgment. The evaluation of available information and the application of engineering principles, standards, guidance, and practices for the purpose of considering motorized mixed use of a road. Engineering judgment shall be exercised by a qualified engineer or by an individual who is working under the supervision of a qualified engineer and who is applying procedures and criteria established by the qualified engineer.

Engineering Report. A report that analyzes risk factors pertaining to a proposed designation of a road for motorized mixed use, that is signed by a qualified engineer, and that is presented to the responsible official. The report may identify alternatives, as well as risks associated with those alternatives, for mitigation of factors contributing to the probability and severity of crashes.

Environmental Analysis. An analysis of alternative actions and their predictable long and short-term environmental effects. Environmental Analyses include physical, biological, social and economic factors.

Environmental Assessment. A brief version of an Environmental Impact Statement.

Environmental Impact Statement (EIS). A statement of the environmental effects of a proposed action and alternatives to it. It is required for major Federal actions under Section 102 of the National Environmental Policy Act (NEPA) and released to the public and other agencies for comment and review. It is a formal document that must follow the requirements of NEPA, the Council on Environmental Quality (CEQ) guidelines, and directives of the agency responsible for the project proposal.

Ephemeral Streams. Streams that flow only as the direct result of rainfall or snowmelt. They have no permanent flow.

Ephemeral Streams. Streams that flow only as the direct result of rainfall or snowmelt. They flow for less than 30 days at any one time per year.

Erosion. The wearing away of the land surface by wind or water.

Escape Cover. Vegetation of sufficient size and density to hide an animal, or an area used by animals to escape from predators.

Evaluation Criteria. Standards developed for appraising alternatives. (See decision

Facilities. Transportation planning, road management and operation, fleet equipment, and engineering services (for example, administrative buildings, water and sanitation systems, sanitary landfills, dams, bridges and communication systems.

Fauna. The animal life of an area.

Forest Development Trails. Those trails wholly or partially within, or adjacent to and serving, the National Forests and other areas administered by the Forest Service that have been included in the forest development transportation plan. (36 CFR 212.1 and 261.2 (FSM 1013.4)

Fire Management. All activities required for the protection of resources from fire and the use of fire to meet land management goals and objectives.

Fisheries Classification. Water bodies and streams classed as either having a cold water or warm water fishery. Designation is dependent upon the dominate species of fish occupying the water.

Fisheries Habitat. Streams, lakes, and reservoirs that support fish, or have the potential to support fish.

Flood Plain. A lowland adjoining a watercourse. At a minimum, the area is subject to a 1% or greater chance of flooding in a given year.

Flora. The plant life of an area.

Forage. All browse and non-woody plants that are eaten by wildlife or livestock.

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Forb. A broadleaf plant that has little or no woody material in it.

Glossary--15

Forest Activity Tracking System (FACTS) - activity tracking system for all levels of the Forest Service

Forest Highway. A forest road under the jurisdiction of, and maintained by, a public authority and open to public travel. (USC: Title 23, Section 101(a)).

Forest Road. As defined in Title 23, Section 101 of the United States Code (23 U.S.C. 101), any road wholly or partly within, or adjacent to, and serving the National Forest System and which is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. (FSM 7705 – Transportation System)

Forest Road or trail. A road or trail wholly or partly within, or adjacent to, and serving the National Forest System and which is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. (FSM 7705 - Transportation System; Final Rule)

Forest Supervisor. The official responsible for administering National Forest lands on an administrative unit, usually one or more National Forests. The Forest Supervisor reports to the Regional Forester.

Forest transportation atlas. A display of the system of roads, trails, and airfields of an administrative unit.

Forest transportation facility. A forest road or trail or an airfield that is displayed in a forest transportation atlas, including bridges, culverts, parking lots, marine access facilities, safety devices, and other improvements appurtenant to the forest transportation system.

Forest transportation system. The system of National Forest System roads, National Forest System trails, and airfields on National Forest System lands.

Forest Transportation System Management. The planning, inventory, analysis, classification, record keeping, scheduling, construction, reconstruction, maintenance, decommissioning, and other operations undertaken to achieve environmentally sound, safe, cost-effective, access for use, protection, administration, and management of National Forest System lands. This inclues documentation with a Forest Transportation Atlas to display the system of roads and trails within the Wasatch-Cache National Forest. (FSM 7705 - Transportation System)

Forage Utilization. The proportion of current year's forage production that is consumed or destroyed by grazing animals. Forage is all browse and herbage that is available and acceptable to grazing animals.

Fragmentation. The splitting or isolating of patches of similar habitat, typically forest cover, but including other types of habitat. Habitat can be fragmented naturally or from forest management activities, such as clearcut logging.

Fuels - Vegetative matter, dead or alive, that burns in a fire. It is broadly characterized by the following categories: 1) **Surface or ground fuels** are within a foot or so of the ground surface, 2) **Ladder fuels** exist when you have a continuous vertical arrangement of fuel that allows fire to easily go from ground level into the tree canopy. 3) **Crown fuels** are the tree limbs and leave that can burn with enough heat and/or wind, or 4) **Live fuels** are the green (live) herbs and shrubs

Fuel break – a natural or man-made barrier that lacks sufficient fuel to maintain a fire that may facilitate containment during wildland fires (Agee 1993)

Fuel model –collections of fuel properties that are used to calculate fire danger indices or fire behavior potential (Anderson 1982)

Fuel Management. The treatment of fuels that would otherwise interfere with effective fire management or control. Fore instance, prescribed fire can reduce the amount of fuels that accumulate on the forest floor before the fuels become so heavy that a natural wildfire in the area would be explosive and impossible to control.

Fuel Treatment. Manipulation or removal of fuels to reduce the likelihood of ignition and/or lessen potential damage and resistance to control (e.g. lopping, chipping, crushing, piling, and burning).

Fuelwood. Wood cut into short lengths for burning.

Function. All the processes within an ecosystem through which the elements interact, such as succession, the food chain, fire, weather, and the hydrologic cycle.

Functional Class. The way a road services land and resource management needs, and the character of service it provides. (FSH 7709.54, Forest Transportation Terminology Handbook, no longer in print)

Game Species. Any species of wildlife or fish that is harvested according to prescribed limits and seasons.

Geographical Information System (GIS) GIS is a computer technology that uses a geographic information system as an analytic framework for managing and integrating data; solving a problem; or understanding a past, present, or future situation. (http://www.gis.com/whatisgis/index.html, 2006)

Goal. A concise statement that articulates a desired condition to be achieved sometime in the future. It is normally expressed in broad, general terms and is timeless in that it has no specific date by which it is to be completed. Goal statement form the principal basis from which objectives are developed.

Government-to-Government Consultation. The active and continuous process of contacting tribal leadership, soliciting their participation, involvement, comments, concerns, contributions, and traditional knowledge that will assist the agency in making informed decisions in planning, managing and decision-making actions.

Grazing Period. The period of time livestock use a specific pasture or unit within a grazing allotment.

Guidelines. An indication or outline (as by a government) of policy or conduct.

Habitat. The area where a plant or animal lives and grows under natural conditions.

Habitat Capability. The ability of a land area or plant community to support a given species of wildlife.

Habitat Diversity. A number of different types of wildlife habitat within a given area.

Habitat Diversity Index. A measure of improvement in habitat diversity.

Habitat Type. A way to classify land area. A habitat can support certain climax vegetation, both trees and undergrowth species. Habitat typing can indicate the biological potential of a site.

Hard Snag. See Snag.

Health and Safety Need. A requirement that addresses a threat to human safety and health (e.g. violations of National Fire Protection Association 101 Life Safety Code or appropriate Health Code) that requires immediate interim abatement and/or long-term permanent abatement. (Financial Health – Common Definitions for Maintenance and Construction Terms, July 22, 1998)

Heritage Resources. See Cultural Resources

Hiding Cover. The vegetation that will hide ninety percent of an elk from the view of a human at a distance of 200 feet or less. The distance which the animal is essentially hidden is called a sight distance.

High Clearance Vehicle. Generally a truck, pickup truck, SUV or ATV with a road clearance that allows travel on low standard roads without vehicle damage and greater than the clearance of a standard passenger vehicle. (Local definition by Ogden Ranger District used for clarity in communication with this analysis.)

Highway-Legal Vehicle. Any motor vehicle that is licensed or certified under state law for general operation on all public roads in the state. Operators of highway-legal vehicles are subject to state traffic law, including requirements for operator licensing.

Historic. A term used to describe the time period for which written records are available (post European contact times in America). However, when speaking of cultural resources, generally a resource must be at least 50 years old to be considered historic.

Historic Property. Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register of Historic Places criteria.

Hydric Soils. Soils indicative of wetland areas, usually characterized by high organic contents that decay slowly due to lack of oxygen. They frequently contain zones of marked discoloration of varying types due to altered or changing oxygenation conditions.

Hydrologically Disturbed. Changes in natural canopy cover (vegetation removal) or a change in surface soil characteristics (such as compaction) that may alter natural streamflow quantities and character. Acres of vegetation within a watershed that are in a non-stocked, seedling, sapling, or first entry category; acres in roads; acres from other types of mechanical treatments and burned acres are included in the calculation of hydrologically disturbed area.

Hydrology. The science dealing with the study of water on the surface of the land, in the soil and underlying rocks and in the atmosphere.

Hydrophytic (wetland) Vegetation. Plants that are adapted to wet conditions. Willows, sedges and rushes are common hydrophytic plants. Lists of plant species that occur in wetlands are at: http://www.nwi.fws.gov/plants.html

Indicator Species. A plant or animal species related to a particular kind of environment. Its presence indicates that specific habitat conditions are also present.

Indigenous (species). Any species of wildlife native to a given land or water area by natural occurrence.

INFRA. The INFRA database (ORACLE) used by the U.S. Forest Service. This database records attributes for every system road, trail, and other Forest Service infrastructure. (Local definition by Ogden Ranger District used for clarity in communication with this analysis.)

Initial Attack. The wildfire control efforts taken by resources that are first to arrive at a wildfire.

Integrated Pest Management. A process for selecting strategies to regulate forest pests in which all aspects of a pest-host system are studies and weighed. The information considered in selecting appropriate strategies includes the impact of the unregulated pest population on various resource values, alternative regulatory tactics and strategies, and benefit/cost estimates for these alternative strategies. Regulatory strategies are based on sound silvicultural practices and ecology of the pest/host

system and consist of a combination of tactics such as timber stand improvement plus selective use of pesticides. A basic principle in the choice of strategy is that it be ecologically compatible or acceptable.

Interdisciplinary Team. A team of individuals with skills from different disciplines that focuses on the same task or project.

Intermittent Stream. A stream that goes dry at some point each year but flows continuously at

least 30 days a year when it receives water, usually from a seasonal groundwater, but may also include some surface source more persistent than a rainstorm, such as melting snow.

Invasive Species. A plant species moving into areas outside of its former range.

Inventoried Roadless Area. (West of the 100th meridian) An area which meets the statutory definition of wilderness, does not contain improved roads maintained for travel by standard passenger-type vehicles, and meets one or more of the following criteria:

1. Contains 5,000 acres or more.

2. Contains less than 5,000 acres, but:

• Due to physiography or vegetation, is manageable in a natural condition.

• Is a self-contained ecosystem such as an island.

• Is contiguous to existing wilderness, primitive area, Administration-endorsed wilderness, or roadless area in other Federal ownership, regardless of size.

Irretrievable. Applies to losses of production, harvest or commitment of renewable natural resources. For example, some or all of the timber production from an area is irretrievably lost during the time an area is used as a winter sports site. If the use is changed, timber production can be resumed. The production lost is irretrievable, but the action is not irreversible.

Irreversible. Applies primarily to the use of nonrenewable resources, such as minerals or cultural resources, or to those factors that are renewable only over long time spans, such as soil productivity. Irreversible also includes loss of future options.

Issue. A point, matter or question of public discussion or interest to be addressed or decided through the planning process. *Preliminary issue* is an issue identified early in the scoping phase and is sometimes referred to as a tentative issue. *Significant issue* is an issue within the scope of the proposed action which is used to formulate alternatives in an Environmental Analysis (EA) or Environmental Impact Statement (EIS).

Jurisdiction. The legal right to control or regulate use of a transportation facility. Jurisdiction requires authority, but not necessarily ownership. The authority to construct or maintain a road may be derived from fee title, an easement, or some other similar method. (FSM 7705 – Transportation System)

Jurisdiction Over a Forest Transportation Facility. The legal right to control or regulate use of a forest transportation facility derived from title, an easement, an agreement, or other similar source.

Legal Notice. A notice of a decision which can be appealed that is published in the Federal Register or in the legal notice section of a newspaper of general circulation.

Lek. An area used habitually by grouse species where the males display for the females each spring. Number of males are counted on the lek each spring to establish general population trends.

Leasable Minerals. 2822.11 - Leasable Minerals With Public Domain Status. The 1920 Mineral Lands Leasing Act, as amended (30 U.S.C. 181--287), authorizes the leasing of coal, phosphate, sodium, potassium, oil, oil shale, gas, and (in Louisiana and New Mexico) sulphur. The 1970 Geothermal Steam Act added geothermal resources to the list of leasable resources. The 1920 and 1970 acts apply to minerals on the following lands:

1. Lands Reserved From Public Domain.

2. Lands Received in Exchange for Public Domain Lands or Timber. Under the General Exchange Act of March 20, 1922 (42 Stat. 465; 16 U.S.C. 485), or special exchange acts.

3. Lands With Minerals Reserved Under Special Authority. Mineral estates reserved to the United States in the original patent remain public land minerals and continue to be leasable under the 1920 act unless their status is changed by specific act of Congress (30 U.S.C. 182). Reacquisition of the lands does not change the public domain status of the minerals. The following acts require a reservation of all minerals or of specified minerals to the United States:

a. Acts of March 3, 1909, and June 22, 1910, as amended (30 U.S.C. 81, et seq.), providing for nonmineral entry of public lands (exclusive of Alaska) withdrawn, classified, or valuable for coal.

b. Act of April 23, 1912 (37 Stat. 90; 30 U.S.C. 77), providing for homestead entry of Alabama lands classified as coal lands.

c. Acts of July 17, 1914, as amended, and of March 4, 1933 (30 U.S.C., 121-124), providing for agricultural entry of lands withdrawn or classified as containing phosphate, nitrate, potash, oil, gas, asphaltic minerals, sodium, and/or sulphur. (Title to these minerals may pass with patent to mining claims located prior to February 25, 1920: Act of July 20, 1956 (70 Stat. 592; 30 U.S.C. 122).)

d. Stock Raising Homestead Act of December 29, 1916 (39 Stat. 864; 43 U.S.C. 299). Providing for stockraising homestead entry of certain lands, subject to a reservation of coal and other minerals.

e. Act of March 8, 1922 (42 Stat. 414; 43 U.S.C. 912), providing for disposal of forfeited railroad right-of-way land and related sites with reservations to the United States of all oil, gas, and other minerals.

f. Act of December 22, 1928, as amended (45 Stat. 1069; 43 U.S.C. 1068), authorizing sale of lands held under color of title; reserves coal and all other minerals with exceptions under certain conditions.

g. Act of February 23, 1932 (47 Stat. 53; 43 U.S.C. 178), authorizing sale of lands adjacent to Spanish or Mexican land grants in New Mexico, reserving to the United States coal and all other minerals.

<u>2822.12 - Leasable Minerals With Acquired Status.</u> The Mineral Leasing Act for Acquired Lands (Act of August 7, 1947) is the leasing authority for acquired federally owned deposits of coal, phosphate, sodium, potassium, oil, oil shale, gas, and sulphur. The 1970 Geothermal Steam Act added geothermal resources to the list of leasable resources. The 1947 and 1970 acts apply to the following lands:

1. Lands purchased under the provisions of the Weeks Law as amended, or received in exchange for such land or timber thereon (Act of March 1, 1911, 36 Stat. 962, as amended; 16 U.S.C. 515-516).

2. Lands donated under section 7 of the Clarke-McNary Act (Act of June 7, 1924, 43 Stat. 654; 16 U.S.C. 569).

3. Lands purchased or donated under the Act of March 3, 1925, as amended (43 Stat. 1133, 16 U.S.C. 555).

4. Lands purchased under any of the so-called receipts acts.

5. Acquired lands administered under Title III, Bank-head-Jones Farm Tenant Act (Act of July 22, 1937, 50 Stat. 525; 7 U.S.C. 1010-1012).

6. Lands received in exchange for public domain land under Title III, Bankhead-Jones Farm Tenant Act. Such lands attain "acquired land" status (Item 1, Executive Order 10175 of October 25, 1950).

7. Acquired lands added to the National Forest System by other acts of Congress.

8. Acquired lands transferred to the Department of Agriculture by other agencies for administration by the Forest Service.

9. Lands reacquired and added to the Carson and Santa Fe National Forests by the act of June 28, 1952 (66 Stat. 284) (formerly comprising the North Half Lobato Grant and the El Pueblo Tract). Applies to minerals reserved in the original patent.

10. Unpatented homestead or other entries purchased under the National Industrial Recovery Act (NIRA), the Emergency Relief Appropriation Act (ERA), or Title III of the Bank-head-Jones Farm Tenant Act and added to the Siuslaw National Forest by the act of November 25, 1940 (54 Stat. 1210).

Lentic. Wetlands that do not contain nor are affected by energy of flowing water, such as isolated ponds and wet meadows.

Local Road. A forest road that connects terminal facilities with forest collector, forest arterial or public highways. Usually forest local roads are single purpose transportation facilities. (FSH 7709.54 – Forest Transportation Terminology Handbook, no longer in print)

Locatable Minerals. Locatable minerals are those minerals that may be located and removed from Federal lands under the authority of the General Mining Law of 1872, as amended.

Low Standard Road. A road intended for travel by high clearance vehicles or ATVs, not standard passenger vehicles. (Local definition by Ogden Ranger District used for clarity in communication with this analysis.)

Maintenance. The act of keeping fixed assets in acceptable condition. It includes preventive maintenance normal repairs; replacement of parts and structural components, and other activities needed to preserve a fixed asset so that it continues to provide acceptable service and achieves its expected life. Maintenance excludes activities aimed at expanding the capacity of an asset or otherwise upgrading it to serve needs different from, or significantly greater than those originally intended. Maintenance includes work needed to meet laws, regulations, codes, and other legal direction as long as the original intent or purpose of the fixed asset is not changed. (Financial Health - Common

Definitions for Maintenance and Construction Terms, July 22, 1998)

Maintenance Level. Defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria. (FSH 7709.58, Sec 12.3 – Transportation System Maintenance Handbook)

Maintenance Level 1: Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed 1 year. Basic custodial maintenance is performed to keep damage to adjacent resource to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage

facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are "prohibit" and "eliminate". Roads receiving level 1 maintenance may be of any type, class or construction standard, and may be managed at any other maintenance level during the time they are open for traffic. However, while being maintained at level 1, they are closed to vehicular traffic, but may be open and suitable for non-motorized uses.

Maintenance Level 2: Assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level. Appropriate traffic management strategies are either (1) discourage or prohibit passenger cars or (2) accept or discourage high clearance vehicles.

Maintenance Level 3: Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material. Appropriate traffic management strategies are either "encourage" or "accept." "Discourage" or "prohibit" strategies may be employed for certain classes of vehicles or users.

Maintenance Level 4: Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated. The most appropriate traffic management strategy is "encourage." However, the "prohibit" strategy may apply to specific classes of vehicles or users at certain times.

Maintenance Level 5: Assigned to roads that provide a high degree of user comfort and convenience. Normally, roads are double-lane, paved facilities. Some may be aggregate surfaced and dust abated. The appropriate traffic management strategy is "encourage."

Management Concern. An issue, problem or a condition which constrains the range of management practices identified by the Forest Service in the planning process.

Management Direction. A statement of multiple-use and other goals and objectives, the associated management prescriptions, and standards and guidelines for attaining them.

Management Prescription. Management practices and intensity selected and scheduled for application on a specific area to attain multiple-use and other goals and objectives.

Mass Movement/Wasting. A general term for the dislodgement and downslope transport of soil and rock material under the direct application of gravitational body stresses. Mass wasting includes slow displacements, such as creep and solifluction and rapid movements such as rockfalls, rockslides and debris flows.

Mass Stability. The existing condition of the soil mantel related to the potential for land mass failure such as landslides, mud flows and debris slides.

Matrix. The least fragmented, most continuous pattern element of a landscape; the vegetation type that is most continuous over a landscape.

Mesic – characterized by or adopted to a wet environment

Mineral Soil. Soil that consists mainly of inorganic material, such as weathered rock, rather than organic matter.

MIS (management indicator species). A wildlife species whose population indicate the health of the ecosystem in which it lives and, consequently, the effects of forest management activities to that ecosystem. MIS are selected by land management agencies. (See indicator species.)

Mission Need. A requirement that addresses a threat or risk to carrying out the mission of the organization. Needs related to administration and providing services (transportation, recreation, grazing, etc.). Needs not covered by health and safety or natural resource protection. (Financial Health – Common Definitions for Maintenance and Construction Terms, July 22, 1998)

Mitigate/mitigation. To lessen the severity. Actions taken to avoid, minimize or rectify the impact of a land management practice.

Mixed Use Analysis. An evaluation done by the Forest Service to consider the probabilities and consequences of accidents associated with the use of licensed street legal vehicles and operators with vehicles and operators that are not licensed use, whether it be mixed use or sole use. (See FS Handbook 7709.52).

Monitoring. The determination of how well project or plan objectives have been met and how closely management practices should be adjusted. (See adaptive management.)

Motorcycle. A two-wheeled motor vehicle on which the two wheels are not side-by-side but in line.

Motorized Access for Dispersed Camping (MADC)

Motorized Mixed Use. Designation of an NFS road for use by both highway-legal and non-highway-legal motor vehicles.

Motorized Trail. A Forest development trail intended for use by motorized vehicles 50 inches or less in width, having a dry weight of 600 pounds or less that travels on three or more low-pressure tires with a seat designed for straddling by the operator. These trails may also be used by motorcycles and are open for use to non-motorized trail users. (Local definition by Ogden Ranger District used for clarity in communication with this analysis.)

Motor vehicle. Any vehicle which is self-propelled, other than: (1) A vehicle operated on rails; and (2) Any wheelchair or mobility device, including one that is batterypowered, that is designed solely for use by a mobilityimpaired person for locomotion, and that is suitable for use in an indoor pedestrian area.

Motor vehicle use map. A map reflecting designated roads, trails, and areas on an administrative unit or a Ranger District of the National Forest System.

Mountain Brush. Vegetation characterized by woody species usually found between

sagebrush/grasslands and coniferous forests at upper elevations. Prominent species include mountain mahogany, mountain maple, chokecherry, serviceberry, etc.

Multiple-Use. The management of all the various renewable surface resources of the National Forest System lands for a variety of purposes such as recreation, range, timber, wildlife and fish habitat, and watershed.

Municipal Watershed. A watershed that serves a public water system as defined in Public Law 93-523 (Safe Drinking Water Act); or as defined in State safe drinking water regulations. The definition does not include communities served by a well or confined ground water unaffected by Forest Service activities.

National Environmental Policy Act (NEPA). This is the basic national charter for protection of the environment. It establishes policy, sets goals and provides means for carrying out the policy.

National Forest Management Act (NFMA). These are rules that require an integration of planning for National Forests and Grasslands, including the planning for timber, range, fish and wildlife, water, wilderness, recreation resources, together with resource protection activities, such as fire management, and the use of other resources, such as minerals.

National Forest System (NFS) Land. Federal lands that have been designated by Executive Order or statute as National Forests, National Grasslands, Purchase Units, and other lands under the administration of the Forest Service, including Experimental Areas and Bankhead-Jones Title III lands.

National Forest System Road. A forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority. A classified forest road under the jurisdiction of the Forest Service. The term "National Forest System roads" is synonymous with the term "forest development roads" as used in 23 U.S.C. 205. (FSM 7705 - Transportation System)

National Forest System trail. A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority.

National Interagency Fire Management Integrated Database (NIFMID)- database that stores data on wildland fire occurrence from US Forest Service fire reports

Native Species. A species of flora or fauna occurring naturally in the United States and that not introduced by humans.

Natural Resource. A feature of the natural environment that is of value in serving human needs.

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Nest Survey. A way to estimate the size of a bird population by counting the number of nests in a given area.

New Road Construction. Activity that results in the addition of forest classified or temporary road miles. (36 CFR 212.1, FSM 7705 – Transportation System)

No Action Alternative. The No Action Alternative describes the current management direction related to motorized access off of designated routes and motorized access for dispersed camping that is *proposed to be changed* by Alternatives 2 and 3.

Nongame. Species of animals not managed for sport hunting.

Non-Highway-Legal Vehicle. Any motor vehicle that is not licensed or certified under state law for general operation on all public roads within the state. Operators of non-highway-legal vehicles are subject to state requirements, if any, for licensing and operation of the vehicle in question.

Non-motorized Trail. A Forest development trail intended for non-motorized users. These trails are also open to bicycles, except in areas recommended for Wilderness designation by the revised forest plan. (Local definition by Ogden Ranger District used for clarity in communication with this analysis.)

Nonnative Species. A species introduced into an ecosystem through human activities.

Nonpoint Source Pollution. Pollution whose source is not specific in location. The sources of discharge are dispersed, not well-defined, or constant. Rain storms and snow melt often make this type of pollution worse. Examples include sediments from logging activities, and runoff from agricultural chemicals.

Non-renewable Resource. A resource whose total quantity does not increase measurably over time, so that each use of the resource diminishes the supply.

Notice of Intent. A notice printed in the Federal Register announcing that an Environmental Impact Statement (EIS) will be prepared.

Noxious Weeds. A plant recognized by law as being especially undesirable, troublesome, and difficult to control.

NWI. National Wetlands Inventory, maintained by the US Fish and Wildlife Service and currently on the WWW at: http://www.nwi.fws.gov

Objective. A clear and quantifiable statement of planned results to be achieved within a stated time period. Something aimed at or striven for within a predetermined time period. An objective must be achievable, be measurable, have a stated time period for completion, be quantifiable, be clear and its results must be described.

Objective Maintenance Level. The maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns. The objective maintenance level may be the same as, or higher or lower than, the operational maintenance level. (FSH 7709.58, Sec12.3 - Transportation System Maintenance Handbook)

Off Highway Vehicle (OHV). Any motor vehicle designed for or capable of cross country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain. **"**OHVs include any snowmobile, ATV, motorcycle, or other off-highway vehicles capable of travel over unimproved terrain." (www.stateparks.utah.gov/ohv/faq.htm, 2004).

Off-Road Vehicles (ORV's). Vehicles such as motorcycles, all-terrain vehicles, four-wheel drive vehicles and snowmobiles.

Open for Public Travel. The road section is available and passable by four-wheeled standard vehicles, and open to the general public for use without restrictive gates, prohibitive signs, or regulation other than restrictions based on size, weight or class of registration, except during scheduled periods, extreme weather or emergency conditions. (23 CFR 460.2(c)). (Local definition by Ogden Ranger District used for clarity in communication with this analysis.)

Open Motorized Route Density (OMRD). Includes all open roads and open

motorized trails. Density may be displayed in miles per square mile for a specified analysis area.

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Operational Maintenance Level. The maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns. It defines the level to which the road is currently being maintained. (FSH 7709.58, Sec 12.3 - Transportation System Maintenance Handbook)

Opportunities. Ways to address or resolve public issues or management concerns in the land and resource management planning process.

Other System. Additional network(s) of travel ways serving a common need or purpose, managed by an entity with the authority to finance, build, operate and maintain the routes. (U.S.C. 101 23 CFR 660, FSM 7740.5 – Federal Lands Highway Programs)

Output. One of the ways functions are described; resources which leave a system, i.e., animals migrating out of an area, mass erosion, removal of commercial timber from an area.

Overland Flow. Surface flow resulting when rainfall (or snow melt) exceeds the infiltration rate and depression storage is filled. Often referred to as Horton or Hortonian overland flow.

Over-Snow Vehicle. A motor vehicle that is designed for use over snow and that runs on a track or tracks and/or a ski or skis, while in use over snow (36 CFR 212.1).

Palustrine. Palustrine systems include wetlands which lack flowing water. See **Lentic**.

Perennial Stream. A stream that flows throughout the year and from source to mouth.

Perlite. A volcanic glass containing water that expands or "pops" when heated to form a lightweight aggregate.

Permitted Grazing. Grazing on a National Forest range allotment under the terms of a grazing permit.

Permittee. A person or persons who utilize the National Forest System lands under a permit, usually a Special Use Permit or livestock grazing permit.

Personal Use. Normally used to describe the type of permit issued for removal of wood products (firewood, posts, poles, and Christmas trees) from National Forest land when the product is for home use and not to be resold for profit.

Plant association group - Plant communities can be classified by a variety of factors such as vegetation structure, site moisture, and overstory and understory plant species composition. Similar plant associations are aggregated and grouped by their climax species, site potential, and moisture similarities into Plant Association Groups

Plant Community. A group of one or more populations of plants in a common spatial arrangement.

Plant Species. The major subdivision of a genus or subgenus of a plant being described or measured.

Potential Natural Vegetation. The vegetation that would exist today if man were removed from the scene and if the plant succession after his removal were telescoped into a single moment. The time compression eliminates the effects of future climatic fluctuations, while the effects of man's earlier activities are permitted to stand.

Prescription. Management practices selected to accomplish specific land and resource management objectives.

Primitive Area. An area within the NFS classified as primitive on the effective date of the Wilderness Act, September 3, 1964 (36 CFR 261.2).

Primitive ROS (Recreation Opportunity Spectrum). A classification of wilderness and recreation opportunity. It is characterized by an essentially unmodified environment, where trails mail be present but structures are rare, and where

it is highly probable to be isolated from the sights and sounds of people. (See ROS.)

Private Road. A road under private ownership authorized by easement to a private party, or a road which provides access pursuant to a reserved or private right. (FS-643, Roads Analysis; Informing Decisions About Managing the National Forest Transportation System, August 1999.).

Programmatic Direction. Sideboards for management which are usually general in nature and designed to be applied over a large area. In the Forest Service, generally referring to Forest Plan direction.

Properly Functioning Condition (PFC). The condition of a resource or ecosystem at any temporal or spatial scale when they are dynamic and resilient to disturbances to structure, composition and processes of their biological or physical components.

Proposal. Exists at the stage in the development of an action when an agency is actively preparing to make a decision on one or more alternative means of accomplishing a goal and the effects can be meaningfully evaluated.

Proposed Action. A proposal by the Forest Service to authorize, recommend or implement an action.

Protocol. A specific way of conducting monitoring or analysis.

Public Access. An indication if the property is posted or restricted from public use.

Public Authority. A Federal, State, county, town or township, Indian tribe, municipal or other local government or instrumentality thereof, with authority to finance, build, operate or maintain toll or toll-free highway facilities. (23 CFR 460.2(b))

Public Forest Service Road. A designated public road under Forest Service jurisdiction that meets the definition of 23 U.S.C. Section 101.

Public Issue. A subject or questions of widespread public interest relating to management of the National Forest System.

Public Land. Land for which title and control rests with a government - federal, state, regional, county or municipal.

Public Participation. Meeting, conferences, seminars, workshops, tours, written comments, responses to survey questionnaires, and similar activities designed and held to obtain comments from the public about Forest Service planning and decision making.

Public Road. Any road or street under the jurisdiction of and maintained by a public authority and open to public travel. (23 U.S.C. 101(a), 23 CFR 460.2(a), FSM 7705 - Transportation System)

Pumice. A light-colored, lightweight volcanic rock consisting mostly of volcanic glass.

Purpose and Need. A statement which briefly specifies the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action.

Qualified Engineer. An engineer who by experience, certification, education, or license is technically trained and experienced to perform the engineering tasks specified and who is designated by the Regional Office Director of Engineering.

Quickflow. Quickflow is overland flow plus interflow that together forms storm flow. Comprises storm runoff to streams from both flow over the surface (Horton overland flow), and water that finds preferential pathways such as "pipes" and bedding planes in the shallow subsurface (interflow). Quickflow does not include infiltrating water that percolates further down to the water table and then travels to streams.

Range (Rangeland). Land on which the principle natural plant cover is composed of native grasses, forbs, and shrubs that area available as forage for big game and livestock.

Range Development. An activity or structure used to improve livestock distribution, rangeland conditions, or otherwise improve range management. Can be structural (fence, water development, etc.) or nonstructural (seeding, vegetation manipulation, etc.).

Range Management. The art and science of planning and directing range use intended to yield the sustained maximum animal production and perpetuation of the natural resources.

Ranger District. The administrative sub-unit of a National Forest that is supervised by a District Ranger who reports directly to the Forest Supervisor.

Raptor. A bird of prey, such as an eagle or hawk.

RARE II. *Roadless Area Review and Evaluation*. The national inventory of roadless and undeveloped areas within the National Forests and Grasslands.

Reclamation. The process of restoring disturbed areas, usually consisting of reshaping, replacing topsoil, and seeding the area.

Recreation Opportunities Spectrum (ROS). – A planning device used to describe and allocate (map) outdoor recreation settings. ROS identifies a number of classes of outdoor recreation settings along a spectrum ranging from Primitive (with almost no development or modification of natural settings - P) to Urban (with the highest possible developed character - U.) Other Classes in ROS from less to more developed include: Semi-Primitive Non- Motorized (SPNM), Semi-Primitive Motorized (SPM) Roaded Natural (RN) and Rural(R). (More detail on ROS can be found in the Wasatch-Cache National Forest Plan (2003) which has applied ROS in its planning.)

Recreation Types: *Developed Recreation*. The type of recreation that occurs where modifications (improvements) enhance recreation opportunities and accommodate intensive recreation activities in a defined area. *Dispersed Recreation*. That type of recreation use that requires few, if any, improvements and may occur over a wide area. This type of recreation involves activities related to roads and trails. The activities do not necessarily take place on or adjacent to a road or trail, only in conjunction with it. Activities tend to be day-use oriented and include hunting, fishing, berry picking, off-road vehicle use, hiking, horseback riding, picnicking, camping, viewing scenery, snowmobiling, and many others.

Regional Forester. The official of the USDA Forest Service responsible for administering an entire region of the Forest Service.

Regulations. Generally refers to the Code of Federal Regulations, Title 36, Chapter II, which covers management of the Forest Service.

Research Natural Area (RNA). Designated areas of land, usually more than 300 acres in size

having characteristics concerning ecological processes that are of scientific or educational interest. These areas are valuable for conducting observation and research activities on plant and animal succession, habitat

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requirements of species, insect and fungus depredations, soil microbiology, phenology, and other related subjects.

Resource Protection Need. A requirement that addresses a threat or risk of damage, obstruction, or negative impact to a natural resource. (Financial Health – Common Definitions for Maintenance and Construction Terms, July 22, 1998)

Responsible Official. The Forest Service employee who has been delegated the authority to carry out a specific planning action.

RHCA. Resource Habitat Conservation Area. Term used to describe riparian areas developed by the agency for INFISH and PACFISH. RHCA width definitions are mostly the same as the "default buffer widths" in the Revised Forest Plan.

Riffle. A shallow rapids where the water flows swiftly over completely or partially submerged obstructions to produce surface agitation, but standing waves are absent.

Right-of-Way. An accurately located strip of land with defined width, point of beginning, and point of ending. It is the area within which the user has authority to conduct operations approved or granted by the landowner in an authorizing document, such as a permit, easement, lease, license, or Memorandum of Understanding (MOU).

Riparian Area. They are along a watercourse or around a lake or pond.

Riparian Ecosystem. The ecosystems around or next to water areas that support unique vegetation and animal communities as a result of the influence of water.

Risk (Fire). The probability that potential harm or undesirable consequences will be realized.

Road. A motor vehicle route over 50 inches wide, unless identified and managed as a trail. A road may be classified, unclassified, or temporary. (36 CFR 212.1, FSM 7705 - Transportation System)

Road Construction or Reconstruction. Supervising, inspecting, actual building, and incurrence of all costs incidental to the construction or reconstruction of a road. Activity that results in a Road Improvement or Road Realignment of an existing classified road. (FSM 7700 - Transportation System)

Roadless Area (or inventoried roadless areas) – Areas of land on the Wasatch-Cache National Forest that have been inventoried and described and are presented in Appendix C of the FEIS for Wasatch-Cache National Forest Plan Revision (2003). Inventoried roadless areas have a number of recognized values and are generally over 5,000 acres

in extent. There is an absence of constructed roads or other imposing man-made features or structures in these areas.

Road Management Objectives (RMO). Defines the intended purpose of an individual road based on management area direction and access management objectives. Road management objectives contain design criteria, operation criteria, and maintenance criteria. (FSH 7709.55, Sec 33 - Transportation Planning Handbook)

Roads Analysis. A Forest Service evaluation of a roads system for transportation planning used to inform management decisions about the benefits and risks inherent in National Forest road systems. Roads analysis does not make decisions about building, decommissioning , closing or opening roads, but creates information for decision

makers to provide a more knowledgeable context on roads for decision making. The objective of roads analysis is to provide line officers with information to develop road systems that are safe, responsive to public needs and desires, affordable and efficiently managed, have minimal ecological impacts, and are in balance with available funding.

Roads Analysis: Informing Decisions about Managing the National Forest Transportation System. FS-643, August 1999.)

Road Decommissioning. Activities that result in the stabilization and restoration of unneeded roads to a more natural state. (36 CFR 212.1, FSM 7705 – Transportation System)

Road Density. The miles of road per square mile.

Road Improvement. Activity that results in an increase of an existing road's traffic service level, expands its capacity, or changes its original design function. (FSM 7705 – Transportation System)

Road Maintenance. The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective. (FSM 7705 – Transportation System)

Road Reroute or Realignment. Activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway. (FSM 7705 - Transportation System)

Road Subject to the Highway Safety Act. An NFS road that is open to public use in a standard passenger car, including a road with access restricted on a seasonal basis and a road closed during extreme weather conditions or for emergencies, but which is otherwise open to public travel.

Road System. An alpha code indicating primary systems designation where primary indicates the system under which principle funding and management criteria for operation and maintenance of a road is derived.

ROD. Record of Decision. An official document in which a deciding official states the alternative that will be implemented from a prepared EIS.

ROS. Recreation Opportunity Spectrum. The land classification system that categorizes land by its setting and the probable recreation experiences and activities it affords. (See Recreation Opportunity Class.)

Route. A road or trail that is signed and managed as a unique entity. Management can change along its length but it is singularly identified. This term is also used in GIS to denote a linear feature composed of one or more arcs or parts of arcs.

Route System. A GIS term for a collection of routes, representing a logical collection of linear features.

RPA. The Forest and Rangeland Renewable Resources Planning Act of 1974. Also refers to the National Assessment and Recommended Program developed to fulfill the requirements of this Act.

RS 2477. Revised Statute 2477; legislation that allows counties to assert that they have access rights on roads and/or trails that existed prior to the establishment of the Forest.

Run-off. The portion of precipitation that flows over the land surface or in open channels.

SaleableMinerals: Often referred to as mineral materials, are identified in the Materials Act of 1947 (30 USC 601) as petrified wood, common varieties of sand, gravel, stone, pumice, pumicite, cinders, clay, peat. They are used for:

Agricultural supply and animal husbandry (limestone)

Building materials (Flagstone, sandstone)

Abrasive materials (pumice)

Construction materials (cinders)

Landscaping materials (granite boulders)

36CFR 228.41 (c)

Scale. In ecosystem management, scale refers to the degree of resolution at which ecosystems are observed and measured.

Scoping. The on-going process to determine public opinion, receive comments and suggestions, and determine issues during the environmental analysis process. It may involve public meetings, telephone conversations or letters.

Sediment. Solid material, both mineral and organic, transported from its site of origin by air, water, gravity, or ice.

Sensitive Species. Plant or animal species which are susceptible to habitat changes or impacts from activities. The official designation is made by the USDA Forest Service at the Region level and is not part of the designation of Threatened or Endangered Species made by the U.S. Fish & Wildlife Service.

Service Life. The length of time that a facility is expected to provide a specified service. (FSH 7709.56b, Sec 05 – Transportation Structures Handbook)

Similar Actions. Actions, which when viewed with other reasonable foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as timing or geography.

Single-track Motorized Trail. A Forest development trail intended for use by motorized vehicles that produce a single track on the ground 18 inches or less in width, essentially motorcycles. These vehicles have a dry weight of 600 pounds or less with a seat designed for straddling by the operator. These trails are also open for use to non-motorized trail users. (USDA-Forest Service. 2004. 36 CFR Part 212, 251, 261, and 295. Travel Management; Designated Routes and Areas for Motor Vehicle Use.)

Slash. The residue left on the ground after timber cutting and/or accumulating there as a result of storm, fire, or other damage. It includes unused logs, uprooted stumps, broken or uprooted stems, branches, twigs, leaves, bark and chips.

Slump. A landslide characterized by a shearing and rotary movement of a generally independent mass of rock or earth along a curved slip surface (concave upward) and about an axis parallel to the slope from which it descends, and by a backward tilting of the mass with respect to that slope so that the slump surface often exhibits a reversed slope facing uphill.

Small Game. Birds and small mammals typically hunted or trapped.

Smoke Management. Application of fire intensities and meteorological processes to

minimize degradation of air quality during prescribed fires.

Snag. A standing dead tree important as habitat for a variety of wildlife species and their prey.

Soil Compaction. A physical change in soil properties that results in a decrease in porosity and increase in soil bulk density and soil strength.

Soil Cover. The type of cover on the soil surface, i.e. live vegetation, litter, rock, pavement, exposed.

Soil Displacement. The movement of the forest floor (litter, duff, and humus layers) and surface soil from one place to another by mechanical forests such as a blade used in piling or windrowing. Mining of surface soil layers by chopping, or bedding operation are not considered displacement.

Soil Erosion Type. A classification system that further defines erosion by running water, wind or gravitational creep that is used to determine watershed condition.

Soil Quality. Long term soil productivity and soil hydrologic function.

Soil Map Unit. A named portion of a landscape shown by a closed delineation and symbol on a soil map. Generally used to assess or monitor watershed condition, site productivity, and site capability.

Soil Puddling. A physical change in soil properties due to shearing forces that alters soil structure and porosity. Puddling occurs when the soil is at or near liquid limit.

Soil Structure. Structure is described by grade, class and type. Terms are used to describe the natural aggregates in the soil called peds in contrast to clods caused by disturbance, fragments by rupture of peds, and concentrations by local concentrations of compounds that irreversibly cement the soil grains together. The six structures, each with its own distinctive shape and arrangement, are: granular, platy, prismatic, columnar, angular blocky, sub-angular blocky, and structureless.

Soil Texture. Texture refers to the relative proportions of clay, silt and sand (less than 2mm in diameter). Clay particles are the smallest, silt particles are intermediate and sand particles are the largest. Loams contain various mixtures of the three basic particle sizes.

Soil and Water Conservation Practices (SWCPs). See BMP.

Soil Compaction. The reduction of soil volume. For instance, the weight of heavy equipment on soils can compact the soil and thereby change it in some ways, such as its ability to absorb water.

Soil Productivity. The capacity of a soil to produce a specific crop. Productivity depends on adequate moisture and soil nutrients, as well as favorable climate.

Special Forest Products. Non-timber renewable plant products such as mushrooms, berries, flowers, etc.

Special Use Permit. A permit issued to an individual or group by the USDA Forest Service for use of National Forest land for a special purpose. Examples might be a Boy Scout Jamboree or a mountain bike race.

Species at Risk. Species which demonstrate a potential for loss of resilience or sustainability if disturbed.

Stability. The resistance of a slope or embankment to failure by sliding or collapsing under normal conditions for which it was designed; e.g. bank stability, slope stability.

Standards and Guidelines. Requirements found in a Forest Plan which impose limits on natural resource management activities, generally for environmental protection.

State Air Quality Regulations. The legal base for control of air pollution sources in that State. Prescribed burning is generally covered under these regulations.

State Implementation Plan. A State plan that covers implementation, maintenance, and enforcement of primary and secondary standards in each air quality control Region, pursuant to section 110 of the Clean Air Act.

Stewardship. Caring for land and associated resources and passing healthy ecosystems to future generations.

Stream Channel. The defined bed and bank of a watercourse down which water travels.

Stream Order. A numbering scheme used to characterize the relative position of stream channels within a drainage. First-order streams are those which have no tributaries. Second-order streams are those which have as tributaries only first-order channels. Third-order streams are formed when two second-order channels come together. Stream order is used to analyze hydrologic response and fisheries.

Stream Type. Alpha-numeric identification given to reoccurring stream channel types based on measurable morphological features such as channel gradient, width/depth ratio, dominant particle size of bed and bank materials, entrenchment of channel and confinement of channel in valley, and landform features, soil erodibility, and stability.

Stream Width. The width of streams or rivers. Generally used to determine stream type, flood hazard, instream flows, and riparian management.

Streamflow. A measure of the volume of water passing a given point in a stream channel at a given point in time.

Subject to the Highway Safety Act. National Forest System roads that are open to use by the public for standard passenger cars. This includes roads with access restricted on a seasonal basis and roads closed during extreme weather conditions or for emergencies, but which are otherwise open for general public use. (FSM 7705 – Transportation System)

Subwatershed. A drainage delineated for one of the streams within a National Forest System (NFS) watershed, often to analyze the effects of a proposed action. The subwatershed chosen for analysis may depend on the size and anticipated effects of a proposal.

Succession. The natural replacement, in time, of one plant community with another. Conditions of the prior plant community (or successional stage) create conditions that are favorable for the establishment of the next stage.

Successional Stage. A stage of development of a plant community as it moves from bare ground to climax. The grass-forb stage of succession precedes the woody shrub stage and so on.

Surface Resources. Renewable resources that are on the surface of the earth, such as timber and forage, in contrast to ground water and minerals which are located beneath the surface.

Suspended Sediment. Sediment which remains in suspension in the water for a considerable period of time without contact with the bottom of the water source and is generally recorded in parts per million or milligrams per liter.

Sustainability. The ability of an ecosystem to maintain ecological processes and functions, biological diversity, and productivity over time.

Sustainable. The yield that a renewable resource can produce continuously at a given intensity of management is said to be sustainable.

Target. A National Forest's annual goal for accomplishment for natural resource programs. Targets represent the commitment of the Forest Service has with Congress to accomplish the work Congress has funded, and are often used as a measure of the agency's performance.

Temporary road or trail. A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road or trail and that is not included in a forest transportation atlas.

Terminal Facility. A transfer point between the forest transportation system and forest resources served by the system, or between different transportation modes, including parking areas, turnouts, boat ramps and docks, trailheads, marine access facilities, airfields, and heliports.

Terrestrial. Pertaining to the land.

Thermal Cover. Cover used by animals to ameliorate effects of weather; for elk, a stand of coniferous trees 40 feet or more tall with an average crown closure of 70 percent or more.

Threatened and Endangered Species Habitat. Those areas currently or potentially occupied or utilized by threatened and endangered species. T&E Species habitat generally falls into one of several categories: critical habitat, proposed critical habitat, occupied habitat, or potential habitat.

Threatened Species. Those plant or animal species likely to become endangered species throughout all or a significant portion of their range within the foreseeable future as designated by the U.S. Fish & Wildlife Service under the Endangered Species Act of 1973.

Total Maximum Daily Load (TMDL). From the Clean Water Act, an amount of a given pollutant that is allowed in a Water Quality Limited Stream.

Traditional Cultural Areas. Those areas of the forest used by Native American Indian tribes for traditional activities and often referred to as “religious use areas” or “sacred areas.” They may include areas traditionally used for gathering of special forest products.

Traffic Service Level. Describes the significant characteristics and operating conditions of a road. (FSH 7709.56, Ch 4 – Road Preconstruction Handbook, FSM 7705 – Transportation System)

Trail. A route 50 inches or less in width or a route over 50 inches wide that is identified and managed as a trail. A trail may be a forest trail, a temporary trail, or an unauthorized or unclassified trail. (Derived from FS Manual 2353.05, 2004 and FS Handbok 2309.18 – Trails Management, 1991.)

Transportation Facility Jurisdiction. The legal right to control or regulate use of a transportation facility derived from fee title, an easement, an agreement, or other similar method. While jurisdiction requires authority, it does not necessarily reflect ownership. (FSM 7705 – Transportation System)

Transportation System. All existing and proposed roads, trails, airfields, and other transportation facilities wholly or partly within or adjacent to and serving the National Forests and other areas administered by the Forest Service or intermingled private lands.

Travel management atlas. An atlas that consists of a forest transportation atlas and a motor vehicle use map or maps. (USDA-Forest Service. 2004. 36 CFR Part 212, 251, 261, and 295. Travel Management; Designated Routes and Areas for Motor Vehicle Use.)

Travelways. Term used to describe a variety of routes, trails, roads, and driveways. The term is generally used for motorized routes. (Local definition by Ogden Ranger District used for clarity in communication with this analysis.)

Treatment – A term used to broadly refer to the vegetative changes made to meet management objectives. It may include thinning, cutting of undesirable trees, prescribed fire, salvage, or any manipulation of the vegetative conditions (Five Buttes EIS).

Treaty Resource. A resource associated with the language in a specific treaty, usually interpreted to include collections or association of species; not limited to a single species. For example: “fish” may include all fish species (some treaties included rights to erect temporary houses for curing fish); “roots and berries” may include a wide variety of plants that will encompass the nature of the plants as they were used historically; grasses are necessarily included for the treaty reserved right to graze cattle or livestock. Hunting rights may include all species of animals hunted in historic and prehistoric times. As these apply to the FS, they are public natural resources on national forest lands, to which American Indian tribes have reserved certain rights for taking or gathering.

Trend. The direction of change in ecological status of a plant community usually expressed as moving "toward", "away from", or "not apparent".

Tribal Consultation. The designated process required for informing and consulting with all relevant Native American tribes prior to any undertaking on federal, state, or municipally owned lands.

Tribal/Treaty Resources. These resources include any cultural resources with ties to a given tribe, as well as current natural resources for which various Native American tribes have been granted specific rights under treaties with the U.S. government.

Tribe. Term used to designate any Native American Indian tribe, band, nation, or other organized group or community which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

Turbidity. A measure of the optical property that causes light to be scattered and absorbed rather than transmitted in straight lines.

Unauthorized road or trail. A road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas. (USDA-Forest Service. 2004. 36 CFR Part 212, 251, 261, and 295. Travel Management; Designated Routes and Areas for Motor Vehicle Use.) Also known as an unclassified road or trail. (Local definition by

Ogden Ranger District used for clarity in communication with this analysis.)

Unclassified Roads. Roads on National Forest System lands that are not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a trail; and those roads that were once under permit or other authorization and were not decommissioned upon the termination of the authorization (36 CFR 212.1, FSM 7705 – Transportation System). Unclassified roads are categorized into two types and recorded in the SYSTEM linear event. The two types are: UND – UNDETERMINED – Roads where long term purpose and need has yet to be determined NOT – NOT NEEDED – Roads not needed for long term management of national forest resources as determined through an appropriate planning document.

Upland Habitat. Habitat located outside of riparian areas or wetlands. Soils are not saturated throughout the growing season.

Unplanned Ignitions – a fire started at random by either natural or human causes, or a deliberate incendiary fire (Deschutes LRMP)

Vegetation Type. A plant community with distinguishable characteristics.

Vertebrate. Species having a backbone or spinal column.

Water Quality Limited Segment (WQLS). A stream or segment of a stream which has been listed by the State as water quality limited for one or more parameters such as temperature, sediment, contaminants, etc. Required by section 303(d) of the Clean Water Act.

Water Quality Limited Stream (WQLS). Water bodies (or segments of water bodies) listed by EPA as not meeting State water quality standards. They are to be monitored to determine if water quality standards are, or are not, being met. On those not meeting standards, TMDLs may be assigned.

Water Table. The upper surface of groundwater. Below it, the soil is saturated with water.

Water Uses. The status of water uses subject to State water laws that is used to determine the water uses and legal status of waters on the National Forests.

Water Yield. The run-off from a watershed, including groundwater outflow.

Watershed. The entire region drained by a waterway (or into a lake or reservoir). More specifically, a watershed is an area of land above a given point on a stream that contributes water to the stream flow at that point.

Wet Areas. Often referred to as "moist sites," they are very important components of elk summer range. These sites, often occurring at the heads of drainages, may be wet sedge meadows, bogs, or seeps.

Wetland. Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (USACE, 1987). Wetlands are mapped based on hydrologic indicators, hydric soils, and hydrophytic vegetation that are characteristic and indicative of frequently wetted areas.

Wetlands. Areas that are permanently wet or are intermittently covered with water.

Wilderness (Wilderness Area). Undeveloped federal land retaining its primeval character, without permanent human habitation or improvements; It is protected and managed to preserve its natural condition. Wilderness Areas are designated by Congress.

Wildland Fire. Any non-structure fire, other than agency- ignited Prescribed Fire, which occurs in the wildland. This includes Wildland Fire Use and Unwanted Wildland Fire.

Wildland Fire Use. The management of naturally ignited wildland fires to accomplish specific, pre-stated resource management objectives in predefined geographic areas outlined in Fire Management Plans.

Wildland/Urban Interface. The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. The area where humans and their development meet or intermingle with undeveloped wildland or vegetative fuels.

Wildlife Habitat Diversity. The distribution and abundance of different plant and animal communities and species within a specific area.

Windthrow. Trees that have been uprooted by the wind.

Xeric – characterized by or adopted to a dry environment (Deschutes LRMP)

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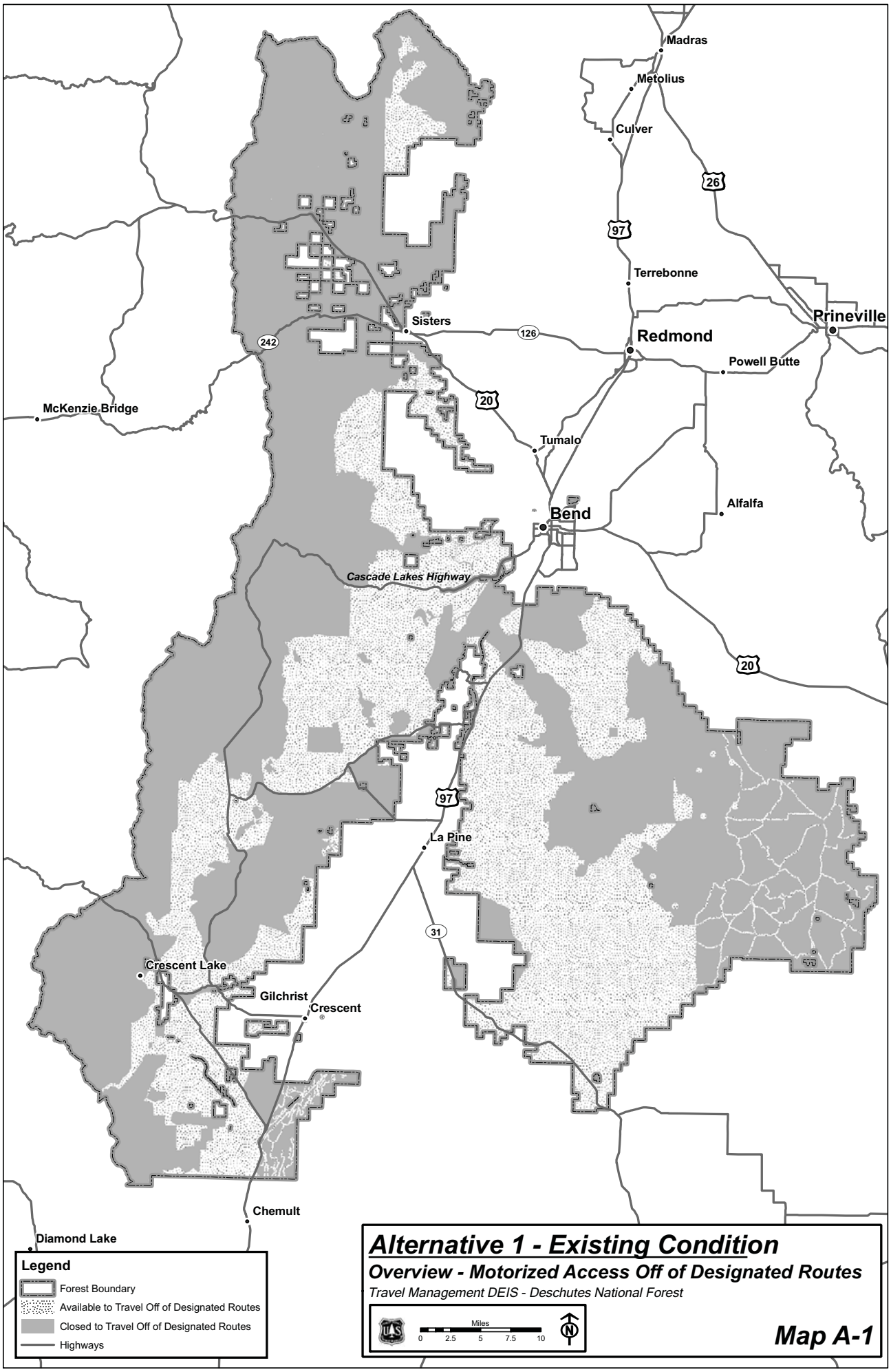
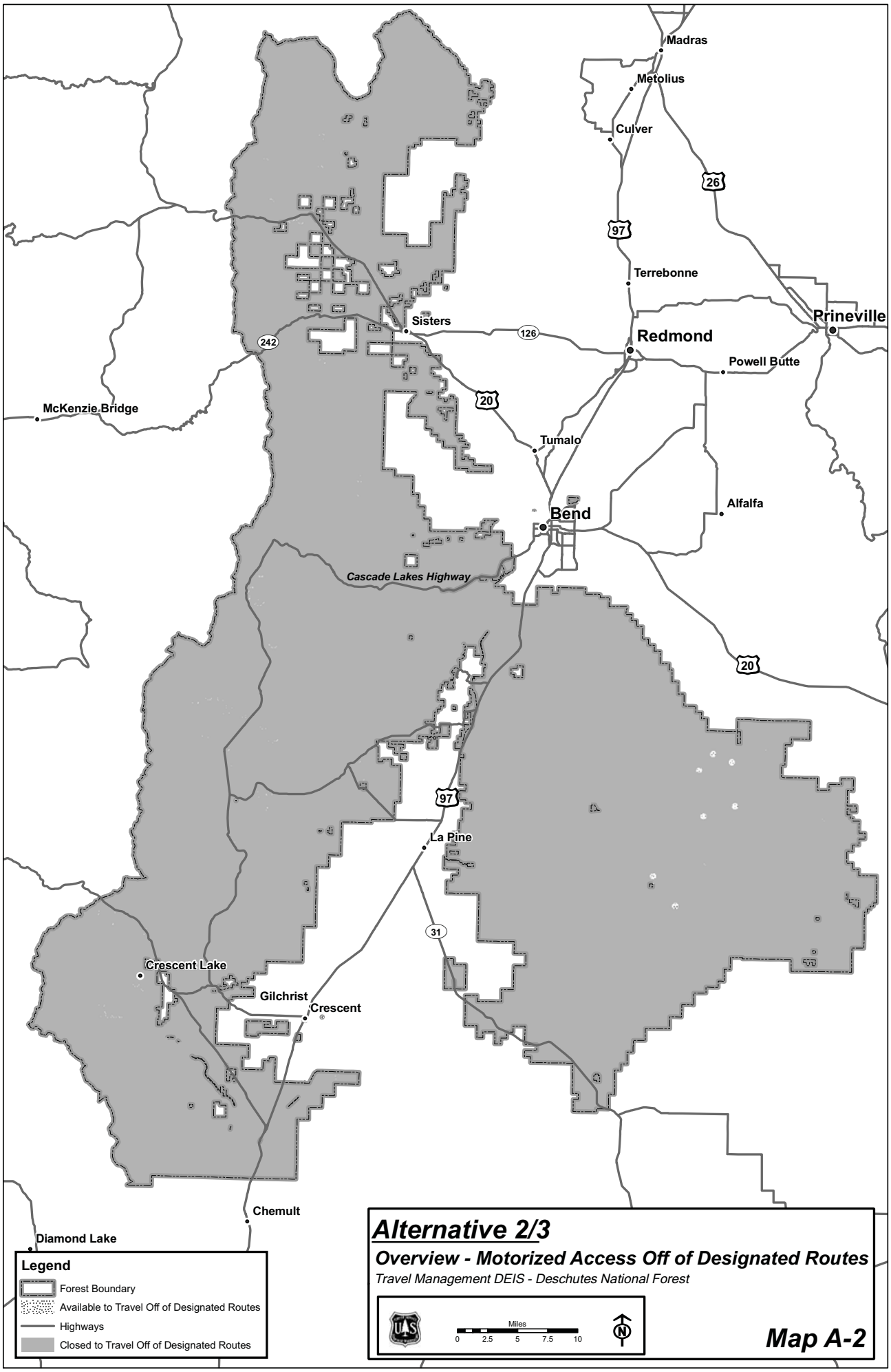


Alternative 1 - Existing Condition

Overview - Motorized Access Off of Designated Routes

Travel Management DEIS - Deschutes National Forest

Map A-1

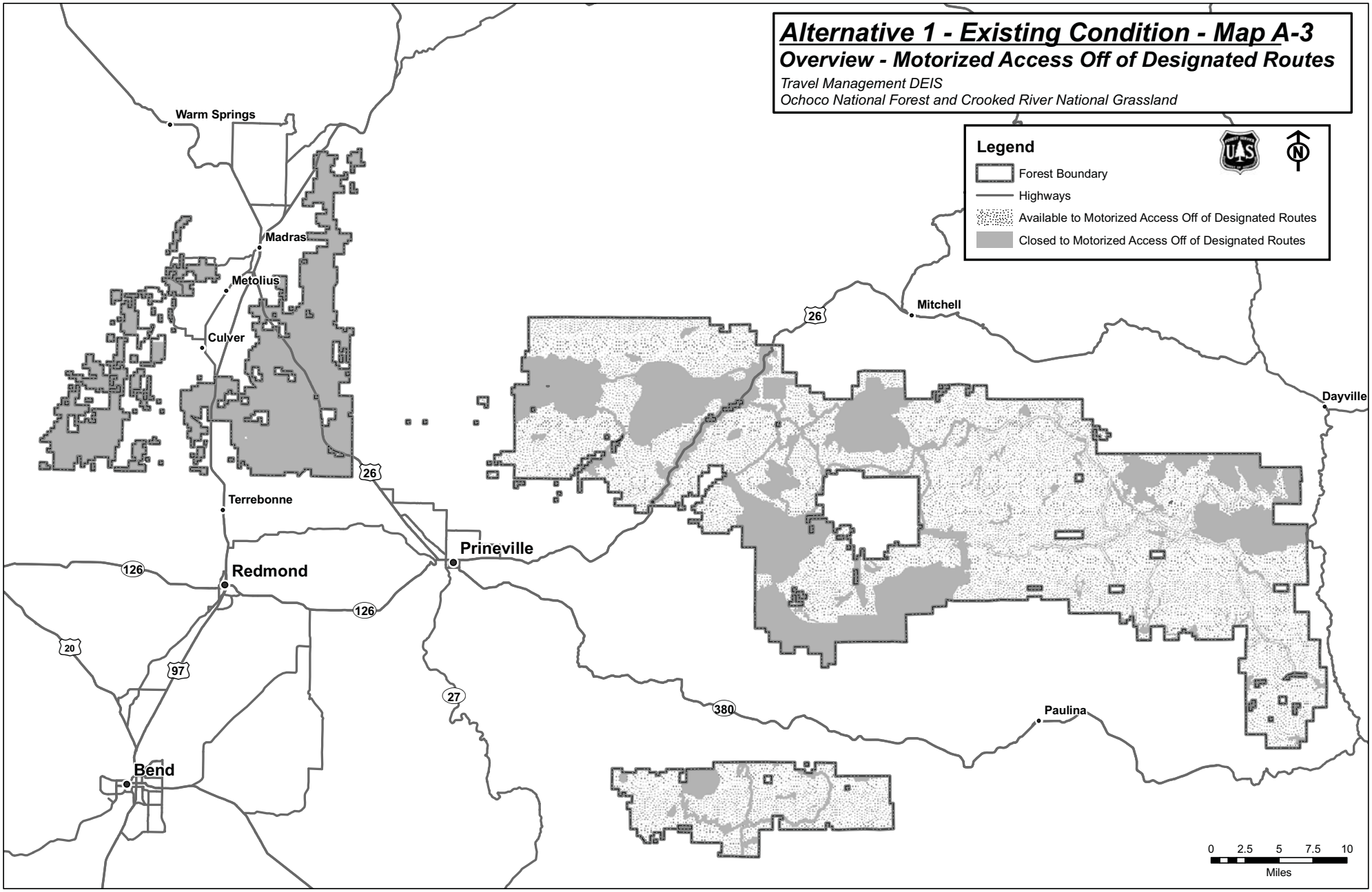


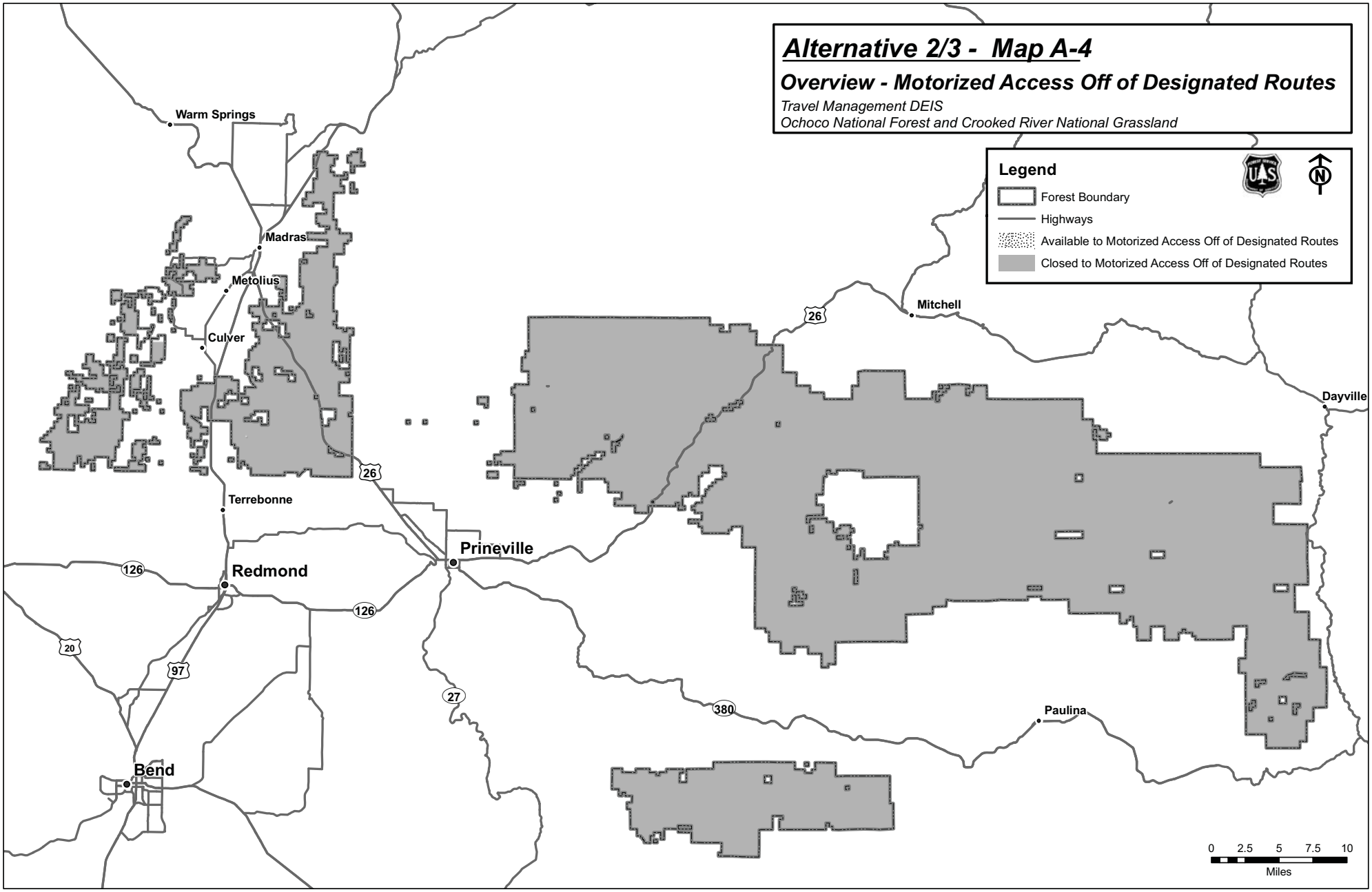
Alternative 2/3

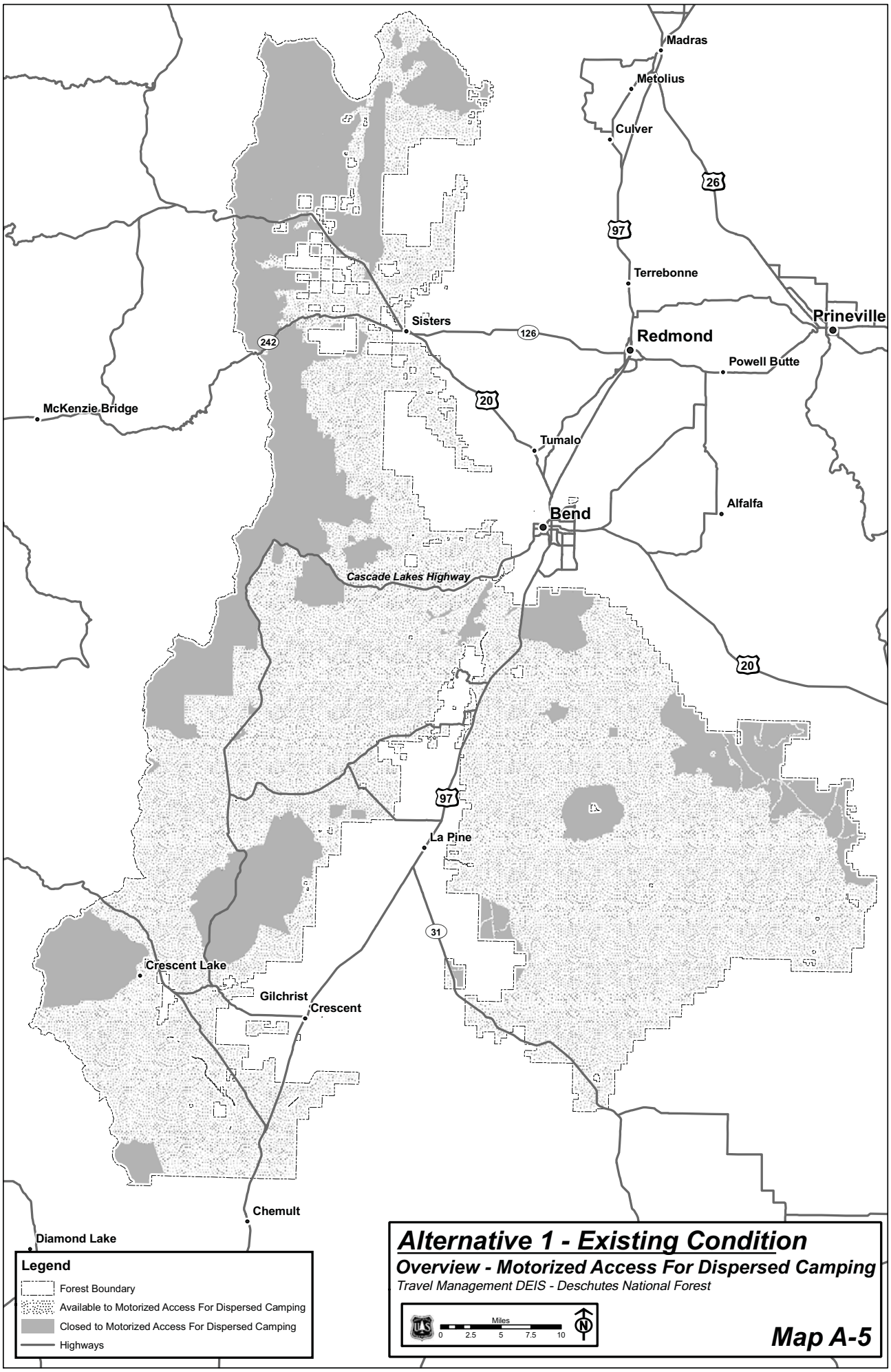
Overview - Motorized Access Off of Designated Routes

Travel Management DEIS - Deschutes National Forest

Map A-2


Alternative 1 - Existing Condition - Map A-3
Overview - Motorized Access Off of Designated Routes
Travel Management DEIS
Ochoco National Forest and Crooked River National Grassland
Legend
Forest Boundary
Highways
Available to Motorized Access Off of Designated Routes
Closed to Motorized Access Off of Designated Routes
Warm Springs
Madras
Metolius
Culver
Terrebonne
Redmond
Prineville
Bend
Mitchell
Dayville
Paulina
26
126
20
97
27
380
0 2.5 5 7.5 10
Miles


Alternative 2/3 - Map A-4
Overview - Motorized Access Off of Designated Routes
Travel Management DEIS
Ochoco National Forest and Crooked River National Grassland
Legend
Forest Boundary
Highways
Available to Motorized Access Off of Designated Routes
Closed to Motorized Access Off of Designated Routes
Warm Springs
Madras
Metolius
Culver
Terrebonne
Redmond
Prineville
Bend
Mitchell
Dayville
Paulina
26
126
20
97
27
380
0 2.5 5 7.5 10
Miles

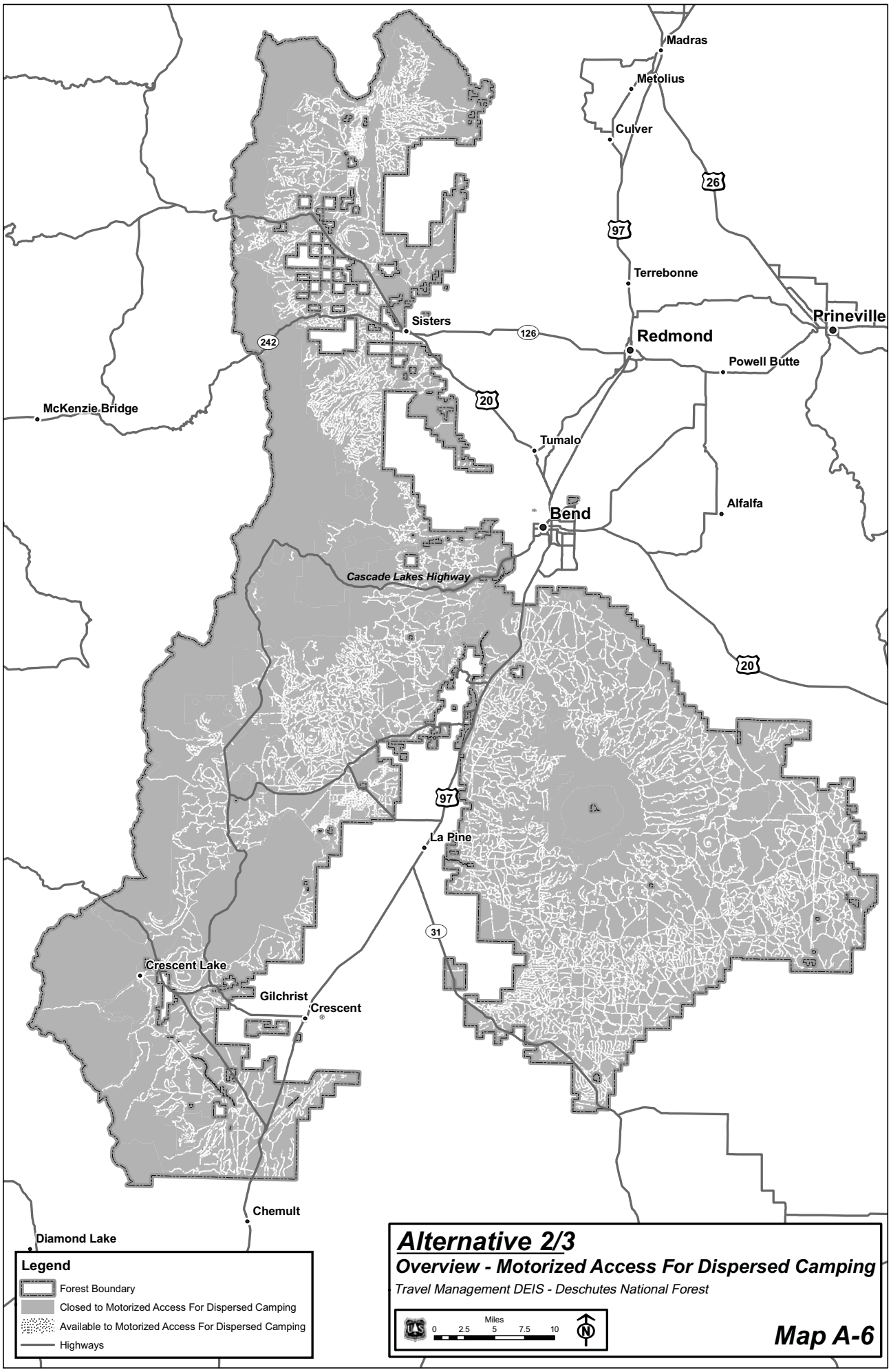


Alternative 1 - Existing Condition

Overview - Motorized Access For Dispersed Camping

Travel Management DEIS - Deschutes National Forest

Map A-5

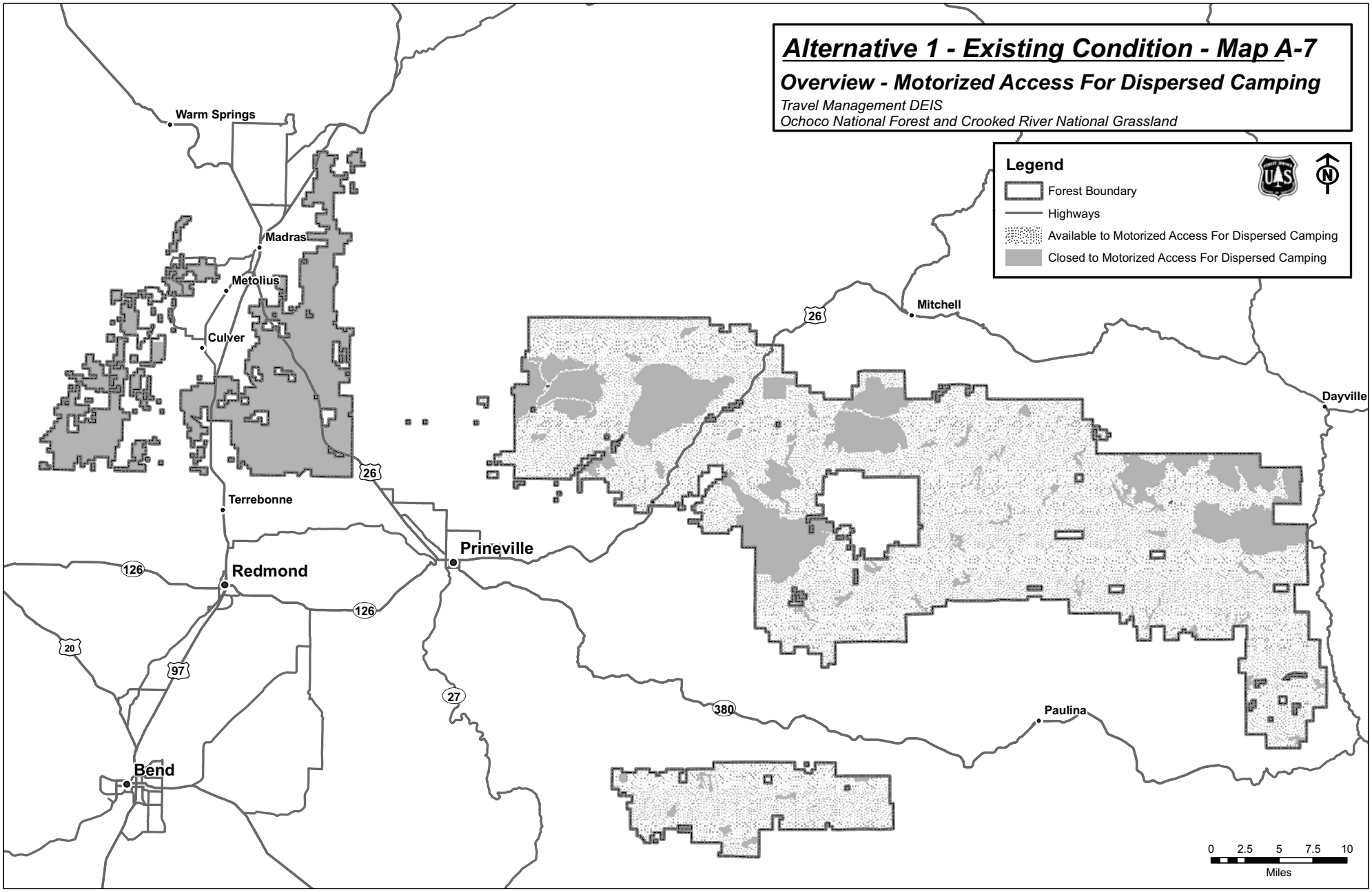


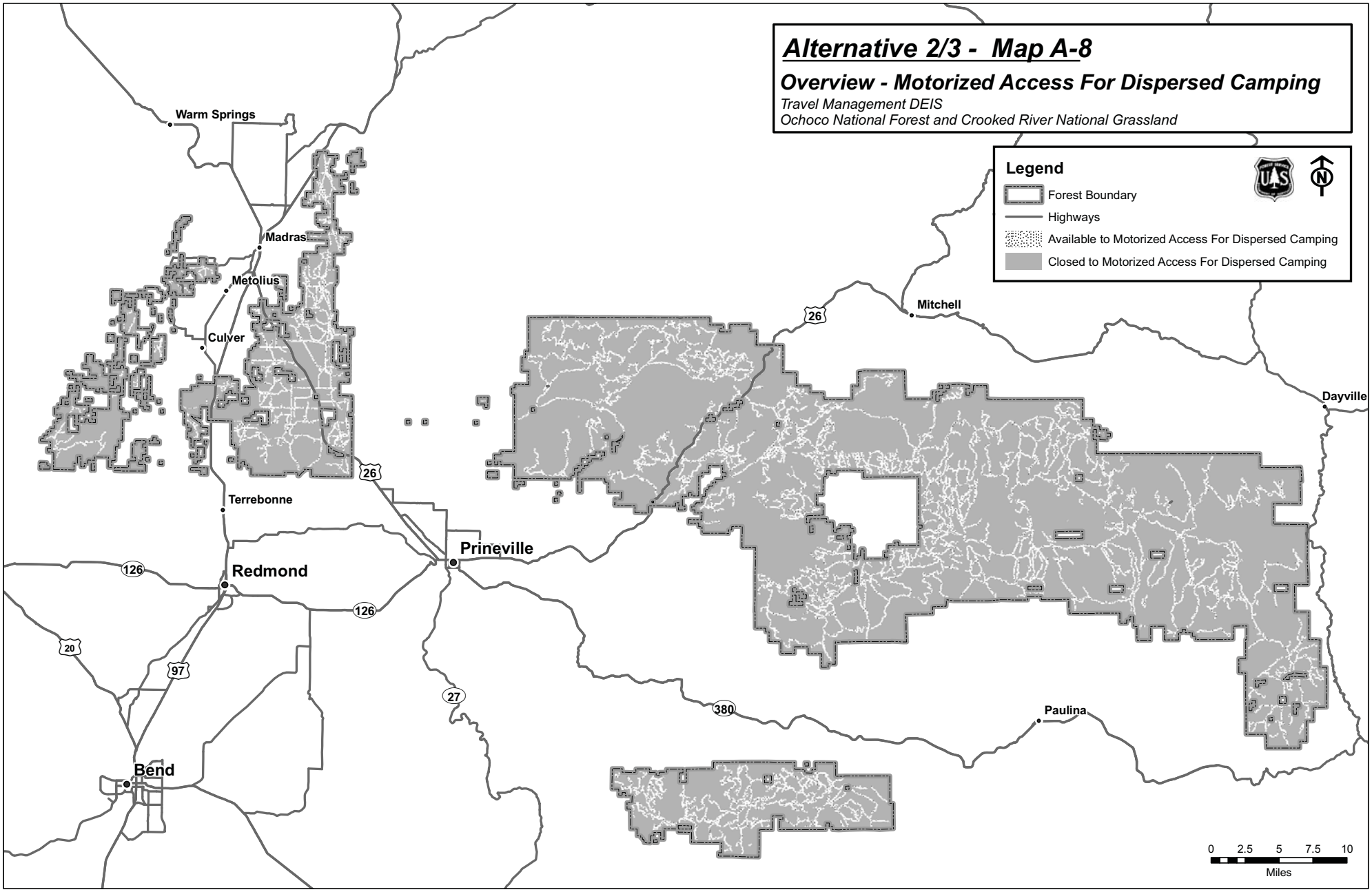
Alternative 2/3

Overview - Motorized Access For Dispersed Camping

Travel Management DEIS - Deschutes National Forest

Map A-6


Alternative 1 - Existing Condition - Map A-7
Overview - Motorized Access For Dispersed Camping
Travel Management DEIS
Ochoco National Forest and Crooked River National Grassland
Legend
Forest Boundary
Highways
Available to Motorized Access For Dispersed Camping
Closed to Motorized Access For Dispersed Camping
Warm Springs
Madras
Metolius
Culver
Terrebonne
Redmond
Prineville
Bend
Mitchell
Dayville
Paulina
26
126
20
97
27
380
0 2.5 5 7.5 10
Miles


Alternative 2/3 - Map A-8
Overview - Motorized Access For Dispersed Camping
Travel Management DEIS
Ochoco National Forest and Crooked River National Grassland
Legend
Forest Boundary
Highways
Available to Motorized Access For Dispersed Camping
Closed to Motorized Access For Dispersed Camping
Warm Springs
Madras
Metolius
Culver
Terrebonne
Redmond
Prineville
Bend
Mitchell
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Paulina
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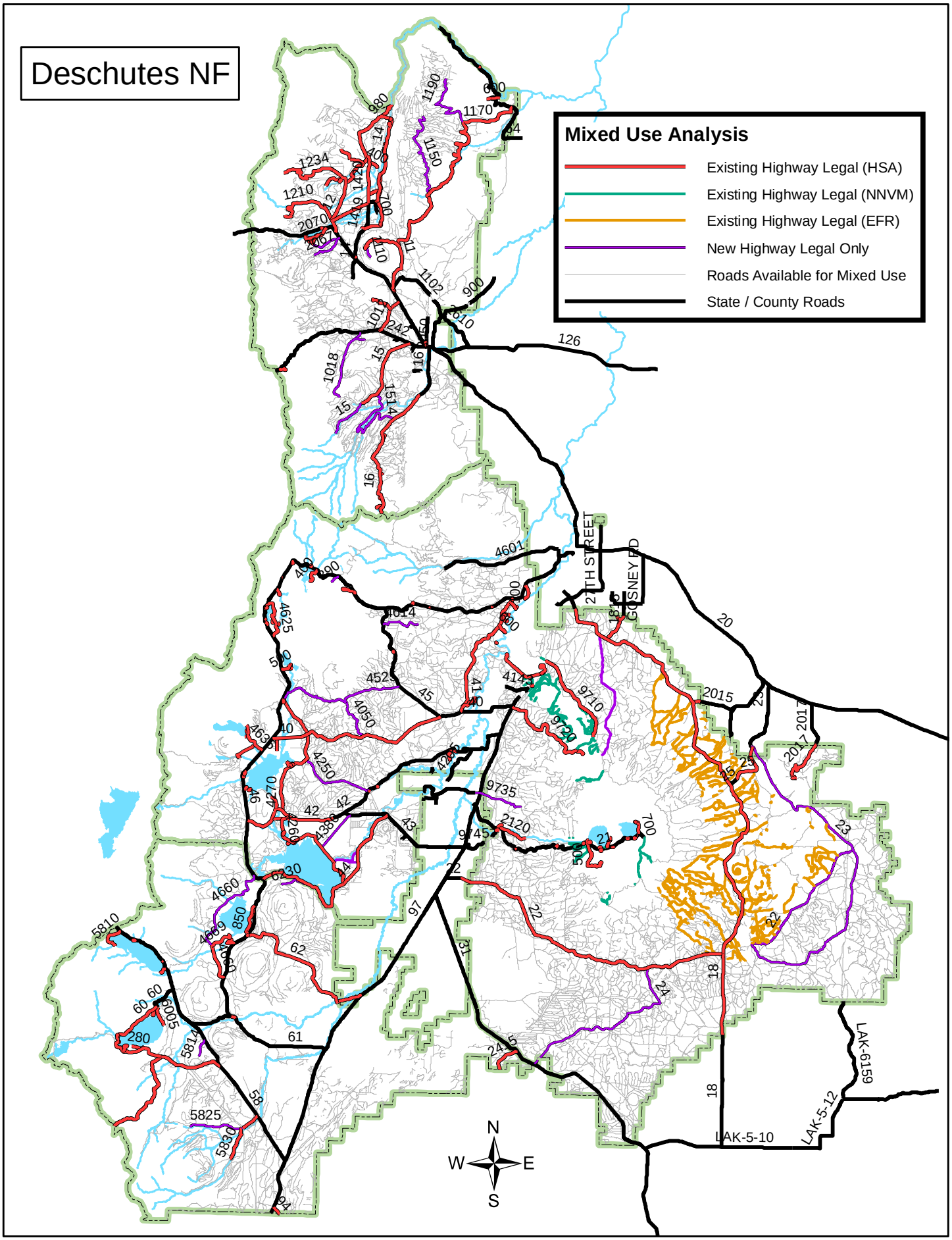
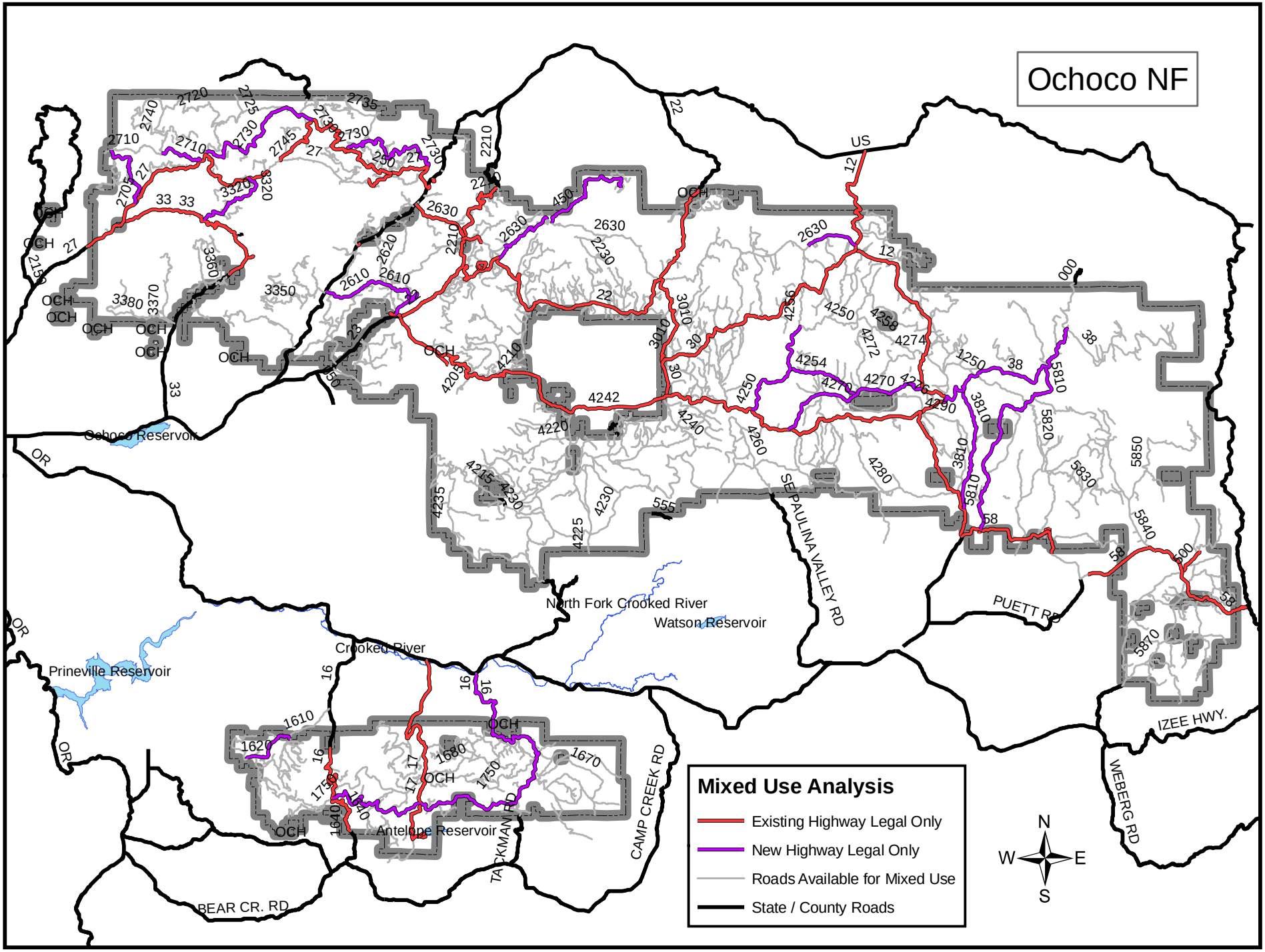
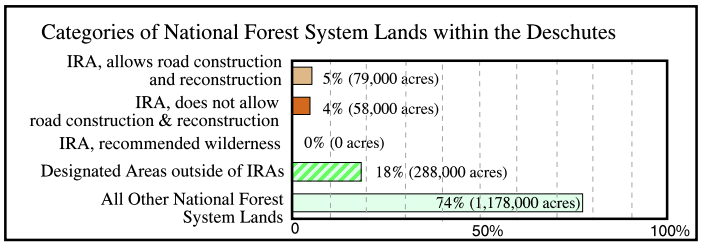
Miles


Deschutes NF
Mixed Use Analysis
Existing Highway Legal (HSA)
Existing Highway Legal (NNVM)
Existing Highway Legal (EFR)
New Highway Legal Only
Roads Available for Mixed Use
State / County Roads
2TH STREET
GOSNEY RD
LAK-6159
LAK-5-12
LAK-5-10
N
W
E
S


Ochoco NF
Mixed Use Analysis
Existing Highway Legal Only
New Highway Legal Only
Roads Available for Mixed Use
State / County Roads
N
W
E
S
Ochoco Reservoir
Prineville Reservoir
Crooked River
North Fork Crooked River
Watson Reservoir
Antelope Reservoir
SE PAULINA VALLEY RD
PUETT RD
IZEE HWY.
WEBERG RD
CAMP CREEK RD
TACKMAN RD
BEAR CR. RD
OR
US

Oregon

DESCHUTES NATIONAL FOREST
Inventoried Roadless Areas



Middle Santiam Wilderness
Mount Jefferson Wilderness
Metolius WSR
Mount Washington Wilderness
McKenzie WSR
Sisters
Redmond
Prineville
Crooked River N.G.
Willamette N.F.
Squaw Creek WSR
Prineville Lake
Bend
Ochoco N.F.
Three Sisters Wilderness
Deschutes N.F.
Newberry National Volcanic Monument
Waldo Lake Wilderness
Crane Prairie Reservoir
Deschutes WSR
Waldo Lake
Wickiup Reservoir
La Pine
Davis Lake
Diamond Peak Wilderness
Crescent Lake
Crescent
Mount Thielsen Wilderness
Umpqua N.F.
Winema N.F.
Fremont N.F.

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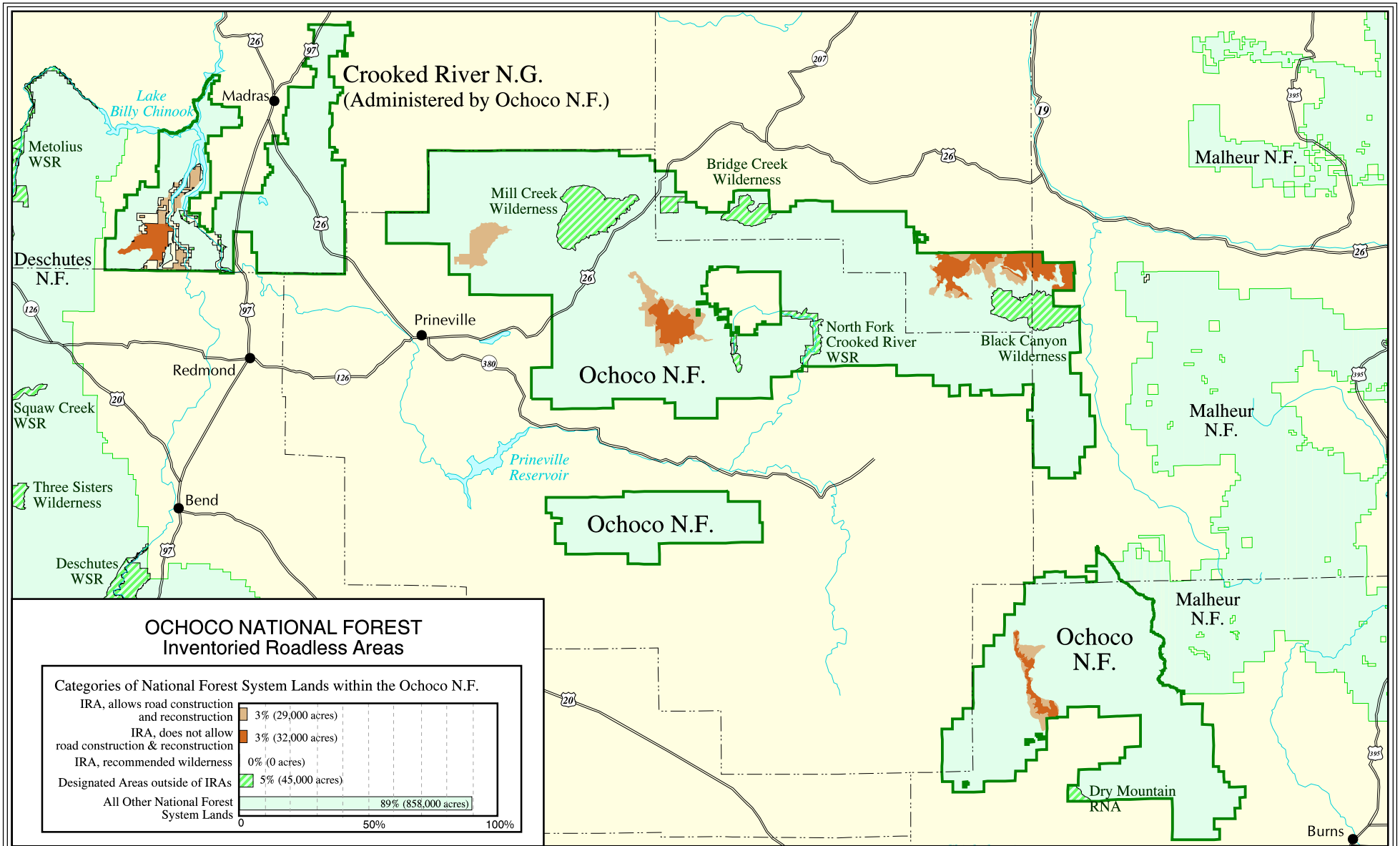
September 15, 2000
Data Supplied by Deschutes National Forest
Contact: Deschutes N.F.
1645 Highway 20 East
Bend, OR 97701
(541) 383-5300

SCALE in MILES
10 0 10 Miles

- Inventoried Roadless Area where road construction or reconstruction is allowed
- Inventoried Roadless Area where road construction or reconstruction is not allowed
- Inventoried Roadless Area where road construction or reconstruction is not allowed, and the forest plan recommends as wilderness
- Designated Areas outside of Inventoried Roadless Areas
- National Forest System lands outside of Inventoried Roadless Areas - not all private land is shown on the map

Interstate Highway
Other Highways
County boundaries

Deschutes National Forest



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September 15, 2000
Data Supplied by Ochoco National Forest
Contact: Ochoco N.F.
3160 NE 3rd Street, Box 490
Prineville, OR 97754
(541) 416-6500

Draft Environmental Impact Statement

Travel Management Project

Deschutes National Forest, Ochoco National Forest, and Crooked River National Grassland

Deschutes, Jefferson, Crook, Klamath, Lake, Grant and Wheeler Counties, Oregon

Spine Text