United States
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Service

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# Final Environmental Impact Statement

## Three Trails Off-Highway Vehicle Project and Forest Plan Amendments

**Crescent Ranger District, Deschutes National Forest**
**Klamath County, Oregon**

Townships 23, 24, 25, 26 South and Ranges 6, 7, 8, 9 East
Willamette Meridian

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# Three Trails OHV Project
# Environmental Impact Statement
# Klamath County, Oregon

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**Abstract:** The Crescent Ranger District on the Deschutes National Forest has analyzed a designated Off-Highway Vehicle (OHV) trail system and staging areas in the vicinity of Walker Mountain, Two Rivers North subdivision, and Crescent Lake Junction. It focuses on areas that are currently being most heavily visited by riders and the alternatives direct the use to the most suitable and sustainable places on the landscape within the 93,016 acre Three Trails OHV project area. This proposal would provide approximately 143 miles of interlinking trails that would vary in skill level and density to match the terrain, design of the staging areas, and to provide an opportunity for beginner through advanced riding experiences. In addition, the proposal would close roads, rehabilitate unneeded trails, and generally locate trails generally away from water.

The proposed action (Alternative B) provides 100-130 miles of interlinking trails, including nine miles of roads converted to trails that would provide a variety of skill levels and density to match the terrain. Upon further detailed analysis utilizing Geographical Information System (GIS) data and on the ground information, the total trail mileage in Alternative B was determined to be approximately 143 miles. It would close/rehabilitate 56 miles of user-created trails located in inappropriate places or are redundant. Three alternatives to the proposed action were developed (Alternatives C, D, and E). Alternative C was developed to offer riders a more enhanced recreational experience and to separate use as much as possible along a two mile section of the Metolius-Windigo Equestrian Trail. It offers longer rides with shorter loops back to three hubs. This is the only alternative that would build a bridge over the Little Deschutes River, designed especially for ATVs. This alternative has approximately 153 miles of trails (including) 53 miles of roads converted to trails and 90 miles of user-created trails to be rehabilitated. Alternative D was developed to provide more effective mule deer and elk summer range, calving/fawning areas, and migration corridors, to dampen noise by moving trails away from residences and closing Muttonchop Butte play pit, and to separate use as much as possible along a two mile section of the Metolius-Windigo Equestrian Trail. This alternative is characterized as having more tightly concentrated loops away from the big game migration routes and private property. There would be 109 miles of engineered trails and 42 miles of roads converted to trails for a total of 151 miles. 95 miles of user-created trails located in inappropriate places or that are redundant would be closed/rehabilitated. Alternative E was a blend of several key issues and it provides a balance using elements from Alternatives C and D, and to separate use as much as possible along a two mile section of the Metolius-Windigo Equestrian Trail. In Alternative E, there would be 142 miles of trail including 21 miles of engineered trails for jeeps and other

4-wheel drive vehicles and 94 miles of user-created trails to be rehabilitated. **Alternative E is the selected alternative**.

The 45-day appeal period begins the day following the date the legal notice of this decision is published in *The Bulletin*, Bend, Oregon, the official newspaper of record. The Notice of Appeal must be filed with the Reviewing Officer at:

***Appeal Deciding Officer,***
***Pacific Northwest Region, USDA Forest Service***
***Attn. 1570 Appeals***
***333 S.W. First Avenue***
***PO Box 3623***
***Portland, OR 97208-3623***

Appeals can also be filed electronically at: appeals-pacificnorthwest-regional-office@fs.fed.us, FAX to 503-808-2339**,** or hand-delivered to the above address between 7:45 AM and 4:30 PM, Monday through Friday except legal holidays. The appeal must be postmarked or delivered within 45 days of the date the legal notice for this decision appears in *The Bulletin* newspaper. The publication date of the legal notice in the newspaper is the exclusive means for calculating the time to file an appeal and those wishing to appeal should not rely on dates or timeframes provided by any other source.

Electronic appeals must be submitted as part of the actual e-mail message or as an attachment in Microsoft Word (.doc), rich text format (.rtf), or portable document format (.pdf) only. E-mails submitted to e-mail addresses other than the one listed above, in other formats than those listed, or containing viruses will be rejected.

It is the responsibility of those who expressed an interest during the comment period and wish to appeal a decision to provide the Regional Forester sufficient written evidence and rationale to show why my decision should be changed or reversed. The appeal must be filed with the Appeal Deciding Officer (§ 215.8) in writing. At a minimum, an appeal must include the following:

1. Appellant's name and address (§ 215.2), with a telephone number, if available;
2. Signature or other verification of authorship upon request (a scanned signature for electronic mail may be filed with the appeal);
3. When multiple names are listed on an appeal, identification of the lead appellant (§ 215.2) and verification of the identity of the lead appellant upon request;
4. The name of the project or activity for which the decision was made, the name and title of the Responsible Official, and the date of the decision;
5. The regulation under which the appeal is being filed, when there is an option to appeal under either this part or part 251, subpart C (§ 215.11(d));
6. Any specific change(s) in the decision that the appellant seeks and rationale for those changes;
7. Any portion(s) of the decision with which the appellant disagrees, and explanation for the disagreement;
8. Why the appellant believes the Responsible Official's decision failed to consider the comments and;
9. How the appellant believes the decision specifically violates law, regulation, or policy.

**Contact Persons**
For additional information concerning the specific activities authorized with the decision, you may contact: Joan Kittrell, Interdisciplinary Team Leader, at the Crescent Ranger District, P.O. Box 208, Crescent, OR 97733 @ (541) 433-3200.

**Send Comments to:**

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# Summary

The Crescent Ranger District on the Deschutes National Forest has analyzed a designated Off-Highway Vehicle (OHV) trail system in the vicinity of Walker Mountain, Two Rivers North subdivision, and Crescent Lake Junction. This proposal would provide approximately 143 miles of interlinking trails that would vary in skill level and density to match the terrain, design of the staging areas, and to provide an opportunity for beginner through advanced riding experiences. In addition, the proposal would close roads, rehabilitate unneeded trails, and develop staging areas within the 93,016 acre Three Trails OHV project area. The analysis area and the 5th field watershed are the same; and it is located about 50 miles south of Bend, Oregon, in Township 23S, Range 6 and 7 East; Township 24 South, Range 6 and 7 East; Township 25 South, Range 7, 8, 9 East and Township 26 South, Range 7, 8, and 9 East. The entire analysis area lies within Klamath County. Approximately one-third of the analysis area (32,044 acres) is within the boundary of the Northwest Forest Plan, with about 20,043 acres in the Matrix allocation. The remaining two-thirds lie within the direction that is provided by the Deschutes Land and Resource Management Plan.

Basically, the project directs existing use to places on the landscape that are suitable for motor vehicle travel while sustaining important watershed functions such as water quality and wildlife habitat for an array of species. Cross-country travel in the project area would be prohibited except in the designated play areas.

The interdisciplinary team worked locally and traveled to communities such as Eugene, Klamath Falls, McMinnville, and Prineville to connect with riders and other concerned citizens between August 2008 and February 2009. Over 100 people have participated in shaping this proposal into a sustainable system.

The Notice of Intent (NOI) was published in the Federal Register on February 25, 2009. The NOI asked for public comment on the proposal from February 25, 2009 – March 25, 2009. In addition to the NOI, the Crescent Ranger District requested feedback on the alternatives in an August 5, 2009 letter updating the interested parties about the progress of Three Trails.

Key issues that drove the alternatives addressed riders experience (Key Issue #1); big game habitat effectiveness (Key Issue #2); noise created by motorized use ( Key Issue #3); and the potential incompatibility with shared use on the Metolius-Windigo Horse Trail (Key Issue #4).

These issues led the agency to develop three alternatives to the proposed action, for a total of four alternatives. The following is a summary of the alternatives:

**Alternative A: No Action**
Under the No Action alternative, no specific management actions would be authorized as a result of this analysis. Enforcement of existing restrictions found in the Deschutes National Forest Plan and site-specific decisions would continue.

Alternative A would maintain the status quo within the project area. Although typical user-created trail systems do not remove trees and take advantage of existing areas of disturbance, herbaceous cover would continue to be removed as trail systems and parking areas expand. It is estimated the user-created trail system has expanded at least two to five miles on a yearly basis.

**Alternative B: The Proposed Action**
The Proposed Action would provide approximately 100-130 miles of trails in three main areas (Junction, Rivers, and Walker) with associated staging areas. Upon further detailed analysis utilizing Geographical

Information System (GIS) data and on the ground information, the total trail mileage in Alternative B was determined to be approximately 143 miles. The trail system would vary in skill level and density to match terrain and the design of the staging areas, it would be linked to shared use roads, it would include a railroad crossing, and a underpass on Highway 97 near the Highway 58 junction. Where redundant access exists or user-created trails are in sensitive areas (riparian or desired wildlife habitat), closure and rehabilitation/restoration would occur. The trail system would be implemented in phases and a general season of use would be May 1 through October 31.

The proposed action would provide trail systems for all three classes of OHVs. They are classified into three standard categories:

**Class I: (**ATVs, three-wheelers and quads) vehicles 50 inches wide or less and dry weight of 800 pounds or less, have a saddle or seat, and travel on three or four tires.
**Class II:** vehicles (jeeps or other 4-wheel drive vehicles) more than 50 inches wide or having a dry weight of more than 800 pounds, but less the 8,000 pounds.
**Class III:** vehicles (motorcycles) riding on two tires with a dry weight of less than 600 pounds.

***Alternative B Associated Actions***
In order for Alternative B to be implemented, the following are associated actions:

- About five miles of currently closed Maintenance Level 1 roads would be opened and used for OHV routes for all classes of vehicles.
- About 41 miles of currently open Maintenance Level 2 roads (changed to Maintenance Level 1) would be closed to offset effects of the designated trail system. All Maintenance Level 1 roads would remain open for administrative access.
- About 12 miles of Maintenance Level 1 and 2 roads would be converted to trail for Class I and III vehicles and eight miles for Class II vehicles.
- About 56 miles of user-created trails that are either located in inappropriate areas and/or are redundant would be closed and rehabilitated.
- About 56 miles of shared use roads for all classes of vehicles.
- An underpass for Highway 97 that links the Rivers and Walker segments.
- A new wildlife guzzler installed on Walker Mountain.
- Railroad crossing south of 5825 road.

**Alternative C:**
Alternative C would provide approximately 153 miles of trails. It responds to Key Issue #1 by providing greater emphasis on rider's recreational experience. Ten miles of additional trail was added in more interesting terrain that accesses play areas at Black Rock and Muttonchop Butte Pits, as well as providing scenic vistas on Little Odell Butte, Black Rock, Royce Mountain, Railroad Ridge, Muttonchop Butte, and Walker Mountain. It offers longer rides with shorter loops back to the three hubs. This is the only alternative that includes a bridge designed for ATVs or motorcycles where riders can traverse the Little Deschutes River. Non-motorized users can access the bridge as well. This alternative has approximately 153 miles of trails (including) 53 miles of roads converted to trails[1], 118 miles of shared use[2] routes, and 327 miles of Maintenance Level 2 roads (for high clearance vehicles) available for motorized use. Total route miles including shared use and engineered trails is 271 miles.

***Alternative C Associated Actions***

[1] Conversion of a road into an engineered trail uses the entire prism of the roadbed to engineer more of a trail experience by narrowing the track and creating meanders and topographic relief with an undulated surface.
[2] Shared use roads are those routes shared by licensed and non-licensed motor vehicles and they have been specifically identified and designated in the Three Trails OHV trail system.

In order for Alternative C to be implemented, the following are associated actions:

- About five miles of currently closed Maintenance Level 1 roads would be opened and used for OHV routes for all classes of vehicles.
- About 108 miles of currently open Maintenance Level 2 roads would be closed (changed to Maintenance Level 1) to offset the effects of a designated trail system. All Maintenance Level 1 roads would remain open for administrative access.
- About 53 miles of Maintenance Level 1 and 2 roads would be converted to trail; 33 miles would be converted for Class I and III vehicles and 20 miles for Class II vehicles.
- About 90 miles of user-created trails that are either located in inappropriate areas and/or are redundant would be closed and rehabilitated.
- About 118 miloes of shared use roads for all classes of vehicles.
- Motorized and non-motorized uses would be separated as much as possible except in wet areas (riparian reserves/RHCA) of the two-mile stretch of the Metolius-Windigo trail, by paralleling wherever possible. Equestrians, hikers, mountain bikers, and motorized users would continue to share portions of the trail due to limited options caused by terrain, land ownership, and proper riparian function of the wet areas. Signing would be used to encourage respectful behavior by all users.
- An underpass for Highway 97 that links the Rivers and Walker segments.
- A new wildlife guzzler installed on Walker Mountain.
- A day use parking area with non-motorized trail to the Little Deschutes River.
- Railroad crossing south of 5825 road.
- A new ATV bridge that crosses the Little Deschutes River.

**Alternative D:**

Alternative D was developed in response to Key Issue #2 by providing more effective mule deer and elk summer range, calving/fawning areas, and migration corridors. It also responds to Key Issue #3 by prohibiting motor vehicle use in the Muttonchop Butte play pit and moving trails to dampen potentially related noise to adjacent residences. This alternative is characterized as having more tightly concentrated loops away from the big game migration routes and private property. There would be 109 miles of engineered trails and 42 miles of roads converted to trails for a total of 151 miles. In addition there are 56 miles of shared use roads for a total 207 route miles.

***Alternative D Associated Actions***

In order for Alternative D to be implemented, the following are associated actions:

- About three miles of currently closed Maintenance Level 1 roads would be opened and used for the OHV routes for all classes of vehicles.
- About 114 miles of currently open Maintenance Level 2 roads would be closed (changed to Maintenance Level 1) to offset the effects of a designated trail system. All Maintenance Level 1 roads would remain open for administrative access.
- About 43 miles of Maintenance Level 1 and 2 roads would be converted to trail; 35 miles would be converted for Class I and III vehicles and eight miles for Class II vehicles.
- About 95 miles of user-created trails that are located in inappropriate areas and/or are redundant would be closed and rehabilitated.
- About 56 miles of shared use roads for all classes of vehicles.
- Motorized and non-motorized uses would be separated as much as possible except in wet areas (riparian reserves/RHCA) of the two-mile stretch of the Metolius-Windigo trail, by paralleling wherever possible. Equestrians, hikers, mountain bikers, and motorized users would continue to share portions of the trail due to limited options caused by terrain, land ownership, and proper riparian function of the wet areas. Signing would be used to encourage respectful behavior by all users.

- An underpass for Highway 97 that links the Rivers and Walker segments.
- A new wildlife guzzler installed on Walker Mountain.
- A day use parking area with non-motorized trail to the Little Deschutes River.
- Railroad crossing south of 5825 road.

**Alternative E:**
Alternative E responds to Issue #1 by incorporating most of the design features that the riders requested (longer loops, interconnected trail systems, access to public goods and services) as in Alternatives C and D, but it also blends Issue #2 by providing some tighter loops in some areas and avoiding an extensive trail system where big game migration corridors are more likely to occur. The total trail miles equals 142; plus 80 miles of connecting high clearance roads for a total 222 route miles. This includes 21 miles of trails engineered for Jeeps and other 4-wheel drive vehicles.

***Alternative E Associated Actions***
In order for Alternative E to be implemented, the following are associated actions:

- About five miles of currently closed Maintenance Level 1 roads would be opened and used for OHV routes for all classes of vehicles.
- About 115 miles of currently open Maintenance Level 2 roads would be closed (changed to Maintenance Level 1) to offset effects of designation of motorized trails. All Maintenance Level 1 roads would remain open for administrative access.
- About 43 miles of currently open Maintenance Level 2 roads would be converted to trails; of those 32 miles would be for Class I and III vehicles and 11 miles for Class II vehicles.
- About 94 miles of user-created trails that are located in inappropriate areas and/or are redundant would be closed and rehabilitated.
- About 80 miles of shared use roads for all classes of vehicles.
- Motorized and non-motorized uses would be separated as much as possible except in wet areas (riparian reserves/RHCA) of the two-mile stretch of the Metolius-Windigo trail, by paralleling wherever possible. Equestrians, hikers, mountain bikers, and motorized users would continue to share portions of the trail due to limited options caused by terrain, land ownership, and proper riparian function of the wet areas. Signing would be used to encourage respectful behavior by all users.
- An underpass for Highway 97 that links the Rivers and Walker segments.
- A new wildlife guzzler installed on Walker Mountain.
- A day use parking area with non-motorized trail to the Little Deschutes River.
- Railroad crossing south of 5825 road.

A Comparison of Alternatives section in table form is available in Chapter 2.

**Forest Plan Amendments**
There are four site-specific amendments to the Deschutes National Forest Land and Resource Management Plan (Forest Plan) for Alternatives B-E:

1, 2. Management Area MA-11 (Intensive Recreation) to include motorized recreation around an existing Sno-Park and on designated trails.

3. Management Area MA-15 (Old Growth) - would change the Old Growth designation from Muttonchop Butte to a large block of mixed conifer habitat better suited for focal species goshawk and American marten. Total number of Old Growth designated acres would remain the same.

4. Key Elk area-(WL-45) the fourth amendment would shift the boundaries of a Key Elk area away from a subdivision and into wetter, less roaded area that would provide more solitude which is better suited for elk. The overall acreage of the Key Elk area would stay the same.

**Major conclusions include:**

***Recreation***

The National Forests are lands where the public enjoys many forms of recreation motorized or non-motorized. This EIS does not attempt to break out the resource by motorized versus non-motorized because 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.

Sound from motorized vehicles travels and can be considered an annoyance. District personnel conducted on the ground sound testing during analysis at Muttonchop Butte Pit and proposed OHV trails. Sound from OHVs dissipates over distance and at 0.89 miles damps to a quiet rural sound as stated in literature. The primary goal of the designated trail system is to allow OHVs a place to recreate. Hikers or those seeking a more quiet form of recreation would be able to view the OHV designated trail system maps and the Motor Vehicle Use Map and plan their quiet recreation accordingly.

There is a two mile stretch of the Metolius-Windigo Equestrian Trail west of the Junction Sno-Park that is currently being shared by horses, unauthorized OHVs, hikers, and mountain bikers. Alternatives C, D, and E would separate users on the two mile stretch where possible except in wet areas (riparian reserves/RHCA) by paralleling where possible and sharing the rest due to limited options caused by terrain, land ownership, and proper riparian function of the wet areas. This section of the trail contains the only safe crossing of Hwy 58, via underpass, to access the Crescent Lake Junction businesses.

The Three Trails OHV project area does not construct or designate OHV trails in Inventoried Roadless Areas, the Oregon Cascade Recreation Area, Wilderness, or Potential Wilderness Areas.

There are three rivers within the Three Trails OHV planning area that are part of the National Wild and Scenic Rivers System. They are Big Marsh Creek, Crescent Creek, and the Little Deschutes River comprising 37 river miles. All activities have been found to be consistent with the Deschutes Land and Resource Management Plan as amended by the Wild and Scenic Management Plans. Also, activities overlapping the Crescent Creek Wild and Scenic are consistent with Management Area M-17 Interium Standards and Guidelines. Also, Outstandingly Remarkable Values are maintained. All activities are subordinate to the landscape.

***Soils***

All activities have been designed to meet Forest Plan and Regional Standards. All areas where active management is to occur would continue to function as productive sites.

***Forested Vegetation***

Converting roads to trails may affect future forested vegetation management by increasing the distance from open roads to treatment areas. This could potentially increase administrative time and contract costs by as much as 25 percent in some areas, because of increased time required to access sites on foot and loss of mechanized equipment like masticators for grinding small trees and slash.

***Fire and Fuels***

The entire Three Trails OHV analysis area is within the Walker Range Community Wildfire Protection Plan and several small communities are embedded.

***Wildlife***
Mule deer and Rocky Mountain Elk are not only popular big game species, they are considered Management Indicator Species for the Deschutes National Forest and elk, in particular, can act as a barometer for species sensitive to human disturbance. Road densities and increased disturbance from motorized and mechanized recreation can alter migration patterns, affect hiding cover, residential development, and poaching. With the designation of a trail system open road densities on National Forest system lands only would drop from a current 3.8 mi/mi$^2$ in Alternative A to a range of 1.9 to 2.2 mi/mi$^2$ for Alternatives B, C, D, and E. Likewise road and motorized trail densities combined would also drop from an existing 4.3 mi/mi$^2$ in Alternative A to a range of 2.5 to 2.8 mi/mi$^2$ on National Forest system lands as measured across the entire 161, 993 acre analysis area bringing them inline with the Land and Resource Management Plan target density for roads of 2.5 mi/mi$^2$ for big game.

Alternatives B, C, D, and E would reduce the overall amount of open roads and motorized OHV use would be confined to a designated trail system. Alternatives B, C, D and E would result in a determination of **"May Effect, Not Likely to Adversely Affect"** the northern spotted owl and northern spotted owl critical habitat. Alternatives B C, D, and E would have **"No Impact"** on the Oregon spotted frog. Alternatives B, C, D, and E would result in a determination of **"Beneficial Impact"** for the Pacific fisher.

***Fisheries and Water Quality***
The determination in the Biological Assessment was that implementation of this project would have **"No Effect"** on fisheries or their aquatic habitat.

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. Alternatives B, C, D, and E maintains water quality by moving trails away from water and restoring user-created trails in inappropriate areas. All activities have been designed to be consistent with the Aquatic Conservation Strategy and Inland Native Fish objectives.

The Little Deschutes River is listed on the Oregon Department of Environmental Quality's (DEQ) 2002 303(d) list as "Water Quality Limited" for elevated summer stream temperatures from river mile 54 to river mile 78. Crescent Creek, throughout its length is listed on the 303(d) list as "Water Quality Limited" by the Oregon Department of Environmental Quality for temperatures exceeding State guidelines. This is mainly due to impoundment and flows released from the dam. Water quality standards cannot be met without restoring streamflows. No actions associated with this project would change the condition of any waterway or water body within the analysis area.

Crescent Creek, throughout its length is listed on the 303(d) list as "Water Quality Limited" by the Oregon Department of Environmental Quality for temperatures exceeding State guidelines. This is mainly due to impoundment and flows released from the dam. Water quality standards cannot be met without restoring streamflows. Due to the remote nature of a considerable segment of Crescent Creek, there are very few user-created trails or dispersed camps that have potential to affect these parameters.

***Invasive Plants***
Based on the vectors and proposed activity, Alternative A was determined to have the greatest risk rating for introduction and spread of existing populations of invasive plants. Alternatives B, C, D, and E would limit riders to the designated trail system providing a greater opportunity to identify and eradicate weeds before they become established.

This project would use prevention as the main strategy to manage invasive plant species (R6 Invasive Plant EIS Standard #7). Actions conducted or authorized by written permit (contracts) that operate

outside the limits of the road prism, require clean equipment prior to entering National Forest System Lands. All active gravel, fill, sand stockpiles, quarry sites, and borrow material will be inspected for invasive plants before use and transport. Only weed-free gravel, fill, sand, and rock would be used.

***Economic and Social***

This project is designed to maintain motorized recreation and riders experience on the Crescent Ranger District. It places the trail system in a sustainable place while connecting to local businesses. This includes avoiding the most potential matsutake mushroom habitat. Input from the Alliance of Forest Workers and Harvesters and historical records from the District were taken into consideration when designing the trail system. Hunting also plays a big part in the local economy. In Klamath County, hunting for deer on Walker Rim, both bow and arrow and rifle (eight weeks total) brings a potential economic boost every fall, not only from the hunting license fees but food, gas, motels, and other amentities. Economically, the Three Trails OHV designated trails system would benefit the small communities of Crescent, Gilchrist, and Crescent Lake that are growing more dependent on the revenue from outside recreationists. A well thought out and maintained trail system for OHVs would boost summer community revenue.

# List of Acronyms

| | |
|---|---|
| ACS - | Aquatic Conservation Strategy |
| ATV - | All Terrain Vehicle |
| BA - | Biological Assessment |
| BBS - | Breeding Bird Surveys |
| BCC - | Birds of Conservation Concern |
| BCR - | Bird Conservation Region |
| BE - | Biological Evaluation |
| BEMA - | Bald Eagle Management Area |
| BI - | Beneficial Impact |
| BLM - | Bureau of Land Management |
| BMP - | Best Management Practices |
| BO - | Biological Opinion |
| BOR - | Bureau of Reclamation |
| CEQ- | Council on Environmental Quality |
| CFR - | Code of Federal Regulations |
| CHU- | Critical Habitat Unit |
| COHVOP | Central Oregon Combined Off-Highway Vehicle Operations |
| CSA - | Conservation Support Areas |
| CWPP - | Community Wildfire Protection Plan |
| DEQ - | Oregon Department of Environmental Quality |
| EA - | Environmental Assessment |
| EIS - | Environmental Impact Statement |
| EPA - | Environmental Protection Agency |
| ESA - | Endangered Species Act of 1973 |
| FRCC - | Fire Regime Condition Class |
| FS - | Forest Service |
| FSH - | Forest Service Handbook |
| FSM - | Forest Service Manual |
| GIS - | Geographical Information System |
| GNN - | Gradient Nearest Neighbor |
| HIM - | Harvest Improvement Cut |
| HRV - | Historic Range of Variability |
| HTH - | Harvest Thinning Cut |
| HUC - | Hydrologic Unit Code |
| INFISH - | Inland Native Fish Strategy |
| IWMP - | Deschutes National Forest Integrated Weed Management Plan |
| LAP - | Land Analysis Process |
| LRMP - | Deschutes National Forest Land and Resource Management Plan (1990) |
| LSR - | Late Successional Reserve |
| MIS - | Management Indicator Species |
| MIIH - | May Impact Individuals or Habitat but Would Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species |
| MOCA- | Managed Owl Conservation Areas |
| MOU - | Memorandum of Understanding |
| MSA - | Magnuson-Stevens Fishery Conservation Act |
| MSL - | Mean Sea Level |
| MVUM - | Motor Vehicle Use Map |
| NEPA - | National Environmental Policy Act |
| NFMA - | National Forest Management Act |

| | |
|---|---|
| NHPA - | National Historic Preservation Act |
| NLAA - | May Affect, but Not Likely to Adversely Affect |
| NMFS - | National Marine Fisheries Service |
| NOI - | Notice of Intent |
| NSRE - | National Survey on Recreation and the Environment |
| NVUM - | National Visitor Use Monitoring |
| NWFP - | Northwest Forest Plan |
| OCRA - | Oregon Cascade Recreation Area |
| ODF - | Oregon Department of Forestry |
| ODFW - | Oregon Department of Fish and Wildlife |
| OEQC - | Oregon Environmental Quality Commission |
| OHV - | Off-Highway Vehicle |
| ORS - | Oregon Revised Statutes |
| ORV - | Outstanding Remarkable Value |
| PAG - | Plant Association Group |
| PDC - | Project Design Criteria from the 2006-2009 Programmatic Biological Assessment |
| PFA - | Post-Fledgling Area |
| R6 - | Region Six |
| RHCA - | Riparian Habitat Conservation Area |
| ROD - | Record of Decision |
| ROS - | Recreation Opportunity Spectrum |
| RR - | Riparian Reserve |
| SCORP - | Statewide Comprehensive Outdoor Recreation Plan |
| SHPO - | State Historic Preservation Office |
| SUV - | Sport Utility Vehicle |
| TES - | Threatened, Endangered and Sensitive Species |
| TM - | Travel Management |
| TMDL - | Total Maximum Daily Load |
| USDA - | United States Department of Agriculture |
| USDI - | United States Department of the Interior |
| USFS - | United States Forest Service |
| USFWS - | United States Fish and Wildlife Service |
| VQO - | Visual Quality Objective |
| WSR - | Wild and Scenic River |
| WQMP - | Water Quality Management Plan |
| WUI - | Wildland-Urban Interface |

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# Chapter 1. Purpose of and Need for Action

## Document Structure

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

- ***Chapter 1. Purpose and Need for Action****:* This chapter includes information on the history of the project proposal, existing conditions within the analysis area, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need.
- ***Chapter 2. Alternatives, including the Proposed Action****:* This chapter provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes mitigation measures. 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 environmental impact statement.
- ***Index****:* The index provides page numbers by subject.
- ***Appendices****:* The appendices provide more detailed information to support the analyses presented in the environmental impact statement. Appendix A describes the management areas and consistency with current laws and management direction.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Crescent Ranger District, Crescent, Oregon.

## Background and Existing Condition

The Crescent Ranger District on the Deschutes National Forest is proposing a designated Off-Highway Vehicle (OHV) trail system. In addition, the proposal would close roads, rehabilitate unneeded trails, and develop staging areas within the 93,016 acre Three Trails OHV project area (Figure 1).

The need for this site-specific proposal is basically a result of a much larger process all National Forests are implementing, the Travel Management Rule. In 2005, the Forest Service codified a national rule that prohibits motorized travel off of designated routes. The Deschutes National Forest is in the process of the finalizing an Environmental Impact Statement (EIS) that displays the environmental effects of implementing the Travel Management Rule. The Rule calls for implementing the decision in collaboration with national forest stakeholders and directs the Forest Service to designate routes (roads and trails) and areas open to motorized travel with some exceptions (exceptions include areas previously restricted to motorized travel (ie. Wilderness areas which are closed by statute). Over-the-snow vehicles are the only motorized use that is excluded from this rule.

Motorized travel in the Three Trails OHV Project area would be prohibited outside of 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. The Three Trails OHV Project would not

close any existing designated motorized trail system currently open for use, although non-highway licensed vehicles are proposed to be prohibited from some roads based on safety concerns. Currently, there are no designated OHV trails on the Crescent Ranger District.

## Purpose and Need for Action

*There is a need to provide for a designated trail system where there is some community support on the Crescent Ranger District in a suitable and sustainable[3] location while considering other forest uses.*
The Three Trails OHV area is used extensively by off-highway enthusiasts, as demonstrated by the many user-created trails. They also utilize other existing roads (closed and open) that may or may not be maintained for high clearance vehicles. Recognizing the effect to the OHV community once the Travel Management Rule is implemented, the Deschutes and Ochoco National Forests were proactive in identifying opportunities for a motorized trail system in suitable and sustainable locations. Through a working group of motorized and non-motorized participants, three areas were identified that had potential community support for a designated trail system. The Three Trails OHV Project is one of them.

While considering a trail system, the project would be designed around a wide range of forest resources and uses such as wildlife habitat, recreational experiences (hunting, fishing, bird-watching, hiking, horseback riding), utilities (powerlines, communication), extraction of forest products, highways, and urban interface with homes. The interdisciplinary team worked diligently to provide trail systems in areas where community support would be the highest, avoiding areas (wherever possible) such as: Late Successional Reserves, designated old growth, key elk habitat, riparian resources, Oregon Cascades Recreation Area, and Wild and Scenic River Corridors. Also, well distributed mule deer hiding cover would be provided to minimize harassment and allow migration across less fragmented trail areas (Rivers and Walker).

## Proposed Action

The proposed action is the implementation development of a trail system and staging areas for Off-Highway Vehicle (OHV) use in the vicinity of Walker Mountain, Two Rivers North subdivision, and Crescent Lake Junction. This proposal would provide approximately 100-130 miles of interlinking trails that would vary in skill level and density to match the terrain, design of the staging areas, and to provide an opportunity for beginner through advanced riding experiences. Upon further detailed analysis utilizing Geographical Information System (GIS) data and on the ground information, the total trail mileage in Alternative B was determined to be approximately 143 miles. The remaining area within the Three Trails OHV project would be closed to cross-country travel. Most roads not maintained for passenger car clearance (Maintenance Level 2 status) would remain open for travel. All other provisions for motor vehicle access, game retrieval, etc. would be the same as the proposed Travel Management Rule for the Deschutes National Forest (see Other Disclosures, Chapter 3).

The Interdisciplinary Team has collaborated locally and in the communities of Eugene and Klamath Falls to identify what a trail system should include.

Trail locations on the map are approximate to allow for site-specific design that would match the terrain to site-specific conditions. The analysis area contains three distinct areas with a focused trail system that would eventually be interconnected: Two Rivers North, Walker Mountain, and Crescent Lake Junction; it is located in all or parts of the following sections:
T23S, R6E, Sec. 36; T23S, R7E, Sec. 31-35;
T24S, R6E, Sec. 1, 2, 4-13, 24, 25, 36; T24S, R7E, Sec. 2-11, 12-24, 26-35;

[3] Sustainable locations are those in the least sensitive areas with larger tolerance to motorized use over time, such as upland/drier sites with the least resources that have a relatively low threshold to habitat modification.

T25S, R7E, Sec. 2-11, 12-24, 26-35; T25S, R8E, Sec. 19, 29-32; T25S R9E Sec. 20-23, 28-32; T26S, R7E, Sec. 1-4, 9-15, 24, 25, 36; T26S, R8E Sec 1-36; T26S, R9E, Sec 6.

## Decision Framework

The Responsible Official for this proposal is the Forest Supervisor of the Deschutes National Forest. The Responsible Official would make a decision and document it in a Record of Decision (ROD). The Responsible Official can decide to:

- Select the proposed action, an action alternative that has been considered in detail, modify an action alternative, or select the no-action alternative.
- Identify what Project Design Features and mitigation measures would apply.
- Determine what monitoring would be necessary.
- Amend the Forest Plan to move the Muttonchop Butte Old Growth area, modify a Key Elk boundary to provide for better habitat, and to allow a designated motorized trail system within an area designated for Intensive Recreation.

The Forest Supervisor would evaluate the alternatives by:

- Examining how well they meet the underlying purpose and need for action;
- Considering their responsiveness to the issues and concerns raised by the public and other agencies; and
- Reviewing their likely environmental effects.

**Figure 1. Three Trails OHV Project Area Locator Map**

# Chapter 2. Alternatives, Including the Proposed Action

## Introduction

This chapter describes public involvement and issue development that led to alternatives. It also compares the alternatives considered for the Three Trails Off-Highway (OHV) Project. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice by the decision maker. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social, and economic effects of implementing each alternative.

## Public Involvement

Motorized access to the National Forest lands is a subject of strong and often polarized public expression. The Three Trails Off-Highway Vehicle Project team held a series of public meetings in the central Oregon area and traveled to the communities of Eugene, Klamath Falls, McMinnville, and Prineville prior to and following the release of the proposed action to obtain feedback. The public scoping letter was mailed on January 27, 2009. Many ideas for trail routes from stakeholders were received and incorporated. Through these series of contacts, a cadre of potential volunteers was also identified to help design, maintain, and monitor a designated trail system in whatever form may result at the end of the public process and when a decision is made.

The Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for Three Trails OHV project was published in the *Federal Register* on February 25, 2009. In addition to the NOI, the Crescent District Ranger requested feedback on the alternatives in an August 05, 2009 letter updating interested parties about the progress of Three Trails.

Early in the process, a link from central Oregon forest website was established and maintained (http://www.fs.fed.us/r6/centraloregon/projects/units/crescent/index.shtml). Table 1 illustrates the public involvement effort for the Three Trails OHV project.

**Table 1. Public Involvement in the Three Trails OHV Planning Process**

| Date | Stakeholder | Format/Information |
|---|---|---|
| August 27, 2008 | Public | Article in the local paper *The Bulletin*: New off-road trails planned for Crescent region south of LaPine. |
| September 10, 2008 | Local Community | Public meeting at Gilchrist High School to introduce Three Trails OHV project and receive feedback. |
| September 17, 2008 | Local Community | Public meeting at Crescent Ranger District to introduce Three Trails OHV project and receive feedback. |
| September 27, 2008 | Mushroom harvesters and buyers, Alliance of Forest Workers and Harvesters | Public meeting at mushroom camp to find out areas of concern with mushroom harvesters and their main picking areas. |

| Date | Stakeholder | Format/Information |
|---|---|---|
| October 14, 2008 | Two Rivers North Property Owners | Letter to homeowners introducing Three Trails OHV Project. |
| October 20, 2008 | Crescent-Gilchrist Community Action Team | Forest Service presented Three Trails OHV Project |
| October 23, 2008 | All OHV riders, public | Public meeting to introduce Three Trails OHV project and receive feedback. |
| November 5, 2008 | Deschutes County 4-wheelers Klamath Four Wheelers | Public meeting at Klamath Falls to introduce Three Trails OHV project and receive feedback. |
| February 7, 2009 | Oregon Equestrian Trail Riders and East Cascades Oregon Backcountry Horsemen | Presented the Three Trails OHV Project and received feedback in Bend, Oregon. |
| February 9, 2009 | Crescent Lake Junction Community Action Team | Forest Service presented Three Trails OHV Project and answered questions. |
| February 25, 2009 | All interested parties | Notice of Intent (NOI) *Federal Register* Vol. 74, No. 36. |
| February 28, 2009 | Oregon Equestrian Trail Riders | Meeting at McMinnville, Oregon to introduce Three Trails OHV project and receive feedback. |
| March 6, 2009 | Deschutes Provincial Advisory Committee Subcommittee Briefing | Public Meeting to update subcommittee members, talk about issues and receive feedback. |
| March 7, 2009 | East Cascades Backcountry Horseman | Meeting in Prineville, Oregon to introduce Three Trails OHV project and receive feedback. |
| March 25, 2009 | Central Oregon Motorcycle and ATV Club | The Forest Service attended the monthly meeting in Redmond, Oregon to present a project update and receive feedback. |
| April 16, 2009 | Emerald Trail Riders | Meeting in Eugene, Oregon to update club on Three Trails OHV Project |
| August 5, 2009 | Public | Update on Three Trails OHV Project and alternatives to interested citizens with request for feedback. |
| August 10, 2009 | Public | Update on Travel Management Rule and Three Trails OHV Project at Gilchrist High School. |
| April 2010 | Public | Article in *The Newberry Eagle* to update the public on status of Three Trails OHV project. |
| April 2010 | Public | Article in the Crescent Lake Community Action Newsletter, Volume 2: Issue 2 to update the public on the status of Three Trails OHV project. |
| July 2010 | Public | Article in *The Newberry Eagle* to update the public on status of Three Trails OHV project. |
| October 1, 2010 | All interested parties | Notice of Availability (NOA) *Federal Register* Vol. 75, No. 190. Friday October 1, 2010. |
| October 5, 2010 | All interested parties | Postcard to All Interested Parties that the DEIS is available and there would be an open house on October 21, 2010 at Crescent Lake. |

| Date | Stakeholder | Format/Information |
|---|---|---|
| October 7, 2010 | Public | Legal Notice in *The Bulletin*, Bend, Oregon for the opportunity to comment on Three Trails OHV DEIS. |
| October 21, 2010 | Public | Open House at Crescent Lake, Oregon to receive feedback/comment on the Three Trails OHV draft EIS. |
| November 2010 | Public | Article in *The Newberry Eagle* that the Three Trails OHV Project DEIS was available for public comment. |

**Consultation with American Indian Tribes**
The proposed action was presented in a letter dated January 28, 2009 (prior to general public release) to the Tribal Chairs and their Cultural Resource Program Managers. Although the Forest Service has received no response to solicited person to person contact and written documenatation, it was assumed The Klamath Tribes would have an interest in potential disturbance to sacred sites on Walker Rim and sounds that are considered intrusions to ceremonies held at those sites. To respond to this concern, the project design has avoided placement of a trail system in direct proximity to known sites and a distance of at least 0.89 miles[4] was used to dampen the sounds of engines on the designated routes.

**Consultation with Government Agencies**

Informal consultation and correspondence has occurred with the US Fish and Wildlife Service (USFWS) and the Environmental Protection Agency (EPA). At this time, collaboration with the USFWS is continuing and the conclusions would be disclosed in the final EIS and Record of Decision. The Environmental Protection Agency follow-up letter to the alternatives was supportive of the transparency with stakeholders and proposed closure of some user-created trails. Also, the agency favored alternatives that addressed noise and potential conflicts with other non-motorized users. They encouraged the Forest Service to address potential threats to adjacent wetlands. To respond, Project Design Features were added wherever the trail routes are adjacent to fens or wetlands. Structures such as split rail fencing or boulders would be utilized to define the boundaries of the designated trail system.

## Issues

Issues are points of discussion, debate, or dispute about environmental effects or competing uses of the resources that may occur as a result of the proposed action. Issues provide focus and influence alternative development, including development of mitigation measures to address potential environmental effects, particularly potential negative effects. Issues are also used to display differing effects between the proposed action and the alternatives regarding a specific resource element.

The project Interdisciplinary Team sorted the comments received during initial scoping into categories to help issue tracking and response. The issues are categorized as follows:

- **Key Issues**: These are issues that cannot be resolved without some consideration of the trade-offs involved and so are used to develop alternatives and design elements. Trade-offs can be

[4] Research and on-the-ground sound testing in the project area indicated that sound dampens at this distance from the source to a level that cannot be heard by most people. Reference the methodology and testing discussions in Recreation, Chapter 3 for more information.

more clearly understood by developing alternatives and displaying the relative effects of these alternatives.

- **Resources of Concern**: These are those resource values that are thought would be affected and desired to be considered in the analysis and decision. If issues were not used to develop alternatives and design elements, they relate to environmental components that are considered in the analysis in Chapter 3. These are important for providing the Responsible Official with complete information about the effects of the project.

**Key Issues**

The alternatives respond to the following key issues identified during initial project scoping. The key issues are specific to the proposed actions and the analysis area. Each issue contains a common attribute and measure of an environmental factor that can help evaluate how each of the alternatives addresses issues. Evaluations of each attribute and measure are provided later in this Chapter in the Comparison of Alternatives section.

**Key Issue #1:** ***The proposed action does not have the proper design to provide the recreational experience riders want.***

The proposed action reflected the interdisciplinary team's initial collaborative effort in trail design. In general, public meetings held around central Oregon, Eugene and Klamath Falls indicated many riders would be satisfied with a trail experience that focused more on existing roads and user-created trails, with the destination of a local business, or residence.

The identification of approximately 100 miles of designated trail focused in three inter-connected but separate areas with staging and access to local destinations was a good start. However, many riders and organizations have indicated they want the trail system better designed and engineered to provide more of a quality experience. This includes a trail system that offers a varying degree of difficulty plus more play areas, a quality camping experience, and additional trail access to scenery. It also needs to be more diverse, offering additional opportunities such as rock crawling for Class II jeeps and other 4-wheel drive vehicles and single track for Class III motorcycles.

Many riders have commented that a well-designed trail is not the same as traveling on a road. Increased "seat time" on their machine and access to scenic vistas provides riders greater satisfaction and ensures greater compliance with the designated trail as they have less desire to leave the trail system. More loops back to the staging areas, or main trail system, where riders can experience previously unexplored terrain, rather than viewing a repetitive landscape is desired. Adding more turns and obstacles and introducing a degree of difficulty has two benefits. First, riders that have a straight line of site tend to travel at higher speeds, which decreases rider's safety. Second, less displacement of soil occurs with lower speeds; therefore required maintenance of the trail tread[5] is reduced.

The following attributes and measures related to rider satisfaction are designed to display expected changes among alternatives:

- System layout (miles of trail by Class of vehicle). Many riders desire the most possible trail miles.
- Number of play areas and scenic viewpoints, providing visual diversity.
- Whether the alternative contains a developed staging area, which not only provides information and logistical support for the ride, but increases the amenities available for overnight and daytime users.

[5] Tread is the actual travel surface of the trail. This is where the rubber (or hoof) meets the trail. Tread is constructed and maintained to support the designed use for your trail (USDOT 2004).

- OHV trail densities. According to comments received regarding quality of a rider's experience, the feeling of solitude on a less dense trail system is preferred.

**Key Issue #2:** ***The designation of a motorized trail system could potentially alter effectiveness of mule deer and elk summer range, calving/fawning areas, and migration corridors.***

Oregon Department of Fish and Wildlife's preliminary analysis of recent telemetry data suggests extensive mule deer use of the project area for fawning, use as summer range, and as a migration corridor. The Ft. Rock Management Unit[6], which includes the Rim-Paunina Project area, is the destination in the summer for mule deer.

Elk also use the project area for summer range and calving, with the greatest amount of use occurring near the western project boundary in the vicinity of Hemlock and Spruce Creeks, Little Deschutes River, and near Crescent Creek. This portion of the analysis area has a greater concentration of wet meadows and stream courses, which is currently providing forage, hiding and thermal cover, and calving areas. While small bands of elk can be found in most of the project area, the greatest use occurs in the western half.
Currently, considerable motorized and unregulated use is occurring in the area. The designation of a trail system and focused use in key areas may result in increased disturbance, and a disruption in daily activity patterns for both species.

The following attributes and measures are designed to display expected changes among alternatives. All of them are related to habitat effectiveness and potential disturbance:

- Open road density available for motorized use within 6th field subwatersheds.
- Number of miles of roads closed.
- Acres of Deschutes National Forest land greater than one mile from an open motorized route in the project area.
- Acres and proximity of hiding cover.

**Key Issue #3:** ***Focused motorized use adjacent to residences is an annoyance.***

OHV enthusiasts living in Two Rivers North subdivision want direct access to the user-created trail system and Muttonchop Butte pit play area. Other residents do not want a public OHV area in their vicinity. Landowners with property directly adjacent to National Forest land have contacted the Crescent District office to report or inquire about the legality of motorized use on existing user-created motorized trails citing noise and dust as an annoyance.

Some residents and respondents to the public scoping have requested there be no designated trail system routes and play areas close to their private property boundary. They also expressed concern for "inviting" too many strangers so close to their homes. OHV owners believe it would be an unwarranted inconvenience for them to have to trailer their machines to a distant staging area. Currently Class I, II, and III vehicles must be muffled to produce no more than 99 decibels sound pressure.

The following attributes and measures are designed to display expected changes among alternatives. Research and on-the-ground sound testing in the project area indicated that sound dampens at 0.89 miles from the source to a level that cannot be heard by most people.

- Acres of private land with residences within 0.89 miles of a proposed OHV trail.

[6] Management units are large landscapes that are delineated because they provide the life requirements in summer and winter for a specific herd of mule deer.

- Acres of private land with residences within 0.89[7] miles of a proposed OHV trails and shared-use road on the designated trail system.
- Miles of non-motorized trail within 0.89 miles of a proposed OHV trail.
- Acres of Wilderness within 0.89 miles of a proposed OHV trail.

**Key Issue #4:** ***There may be incompatibility where the designated trail system overlaps the Metolius-Windigo Horse Trail system.***

The Metolius-Windigo trail extends from the head of the Metolius River south into southern Oregon. This 100+-mile National Recreation trail begins near the Metolius River headwaters west of Sisters and runs south to Windigo Pass near Crescent Lake. The trail was created around 1980 by linking sections of existing trails, primarily to serve long-distance horse riders seeking an alternative to the Pacific Crest Trail. The trail is predominately single track dirt trail with moderate elevation change. Portions are heavily used by horse riders during the spring to fall period.

As part of the design of the Proposed Action in the Junction area, the designated OHV trail system utilizes the Highway 58 undercrossing near the businesses that serve the community of Crescent Lake Junction. It was installed in 2005 and was primarily designed to accommodate snowmobiles and snow groomers. It is currently utilized by snowmobilers, mountain bikers, equestrians, and OHV riders and is the only safe crossing available for the Crescent Lake Junction area.

Trail access to the undercrossing using public property is limited by sensitive resources such as seasonally wet areas, lakes and streams, the boundary of the Diamond Peak Wilderness, State Highway 60 (Crescent Lake Highway), and resort operations at Odell Lake. Consequently, approximately two miles would be shared between the Metolius-Windigo Trail and other modes of recreation that radiate from the Junction area.

Public comment and organized equestrian groups have indicated that designation of an OHV trail and shared use would bring more riders and potential for conflict. Although the mutual undercrossing is unavoidable, the two miles of overlapping shared use may no longer be compatible for all recreation uses. Separation of uses is the desired condition. Motorized and non-motorized uses that encounter horse riders on the trail have the potential to surprise and frighten animals, causing unexpected behavior that places the riders, animals, and other users at risk to injury.

The following attribute and measure was designed to display expected changes among alternatives:

- Miles of designated OHV trail that overlap Metolius-Windigo horse trail.

## Analysis Issues

Other issues and concerns for various resource areas were raised during scoping that did not result in different alternatives or design elements, but are considered during the analysis process and discussed in Chapter 3.

**Aquatic resources including fish habitat**
**Botanical resources and invasive plant species**
**Congressionally Designated Areas**
**Cultural resources**
**Law Enforcement and rider safety**
**Recreation for both motorized and non-motorized uses and accessibility**

[7] See Chapter 3 Recreation for Methodology.

**Public Safety**
**Scenery as it relates to Forest Plan consistency**
**Social and Economic effects**
**Soil and Water Quality**
**Wildlife**

# Alternatives Considered in Detail

The Forest Service developed three alternatives to the Proposed Action, for a total of five alternatives, including the No Action, for the Three Trails OHV Project. The No Action Alternative is used as a baseline to display consequences of a passive management scenario. This section includes a description and map of each Action Alternative considered. It also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Information used to compare the alternatives is based upon the design of the alternative (i.e. miles of designated roads and trails for OHV use and other added features) and on the environmental, economic, and social effects of implementing each alternative. The season of use would generally be from May 01 through October 31.

No activities would occur within the boundary of the Oregon Cascade Recreation Area (OCRA), Wilderness, Potential Wilderness Areas, or Inventoried Roadless. Dispersed camping and access to those camps remains as specified in the Deschutes and Ochoco National Forests and Crooked River National Grassland Travel Management DEIS (Travel Management DEIS) and is not a part of this decision.

## Alternative A

### No Action

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). Motorized access would remain in its current condition with cross-country travel virtually across the entire project area. Enforcement of existing restrictions found in the Deschutes National Forest Plan and site-specific decisions would continue. 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. 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 move Old Growth or Key Elk areas to allow them to better function for the species for which they were intended, or encouraging motorized use in the Intensive Recreation Management Area.

Alternative A would maintain the status quo within the project area. Although typical user-created trail systems do not remove trees and take advantage of existing areas of disturbance, herbaceous cover would continue to be removed as trail systems and parking areas expand. It is estimated the user-created trail system has expanded at least two to five miles on a yearly basis.

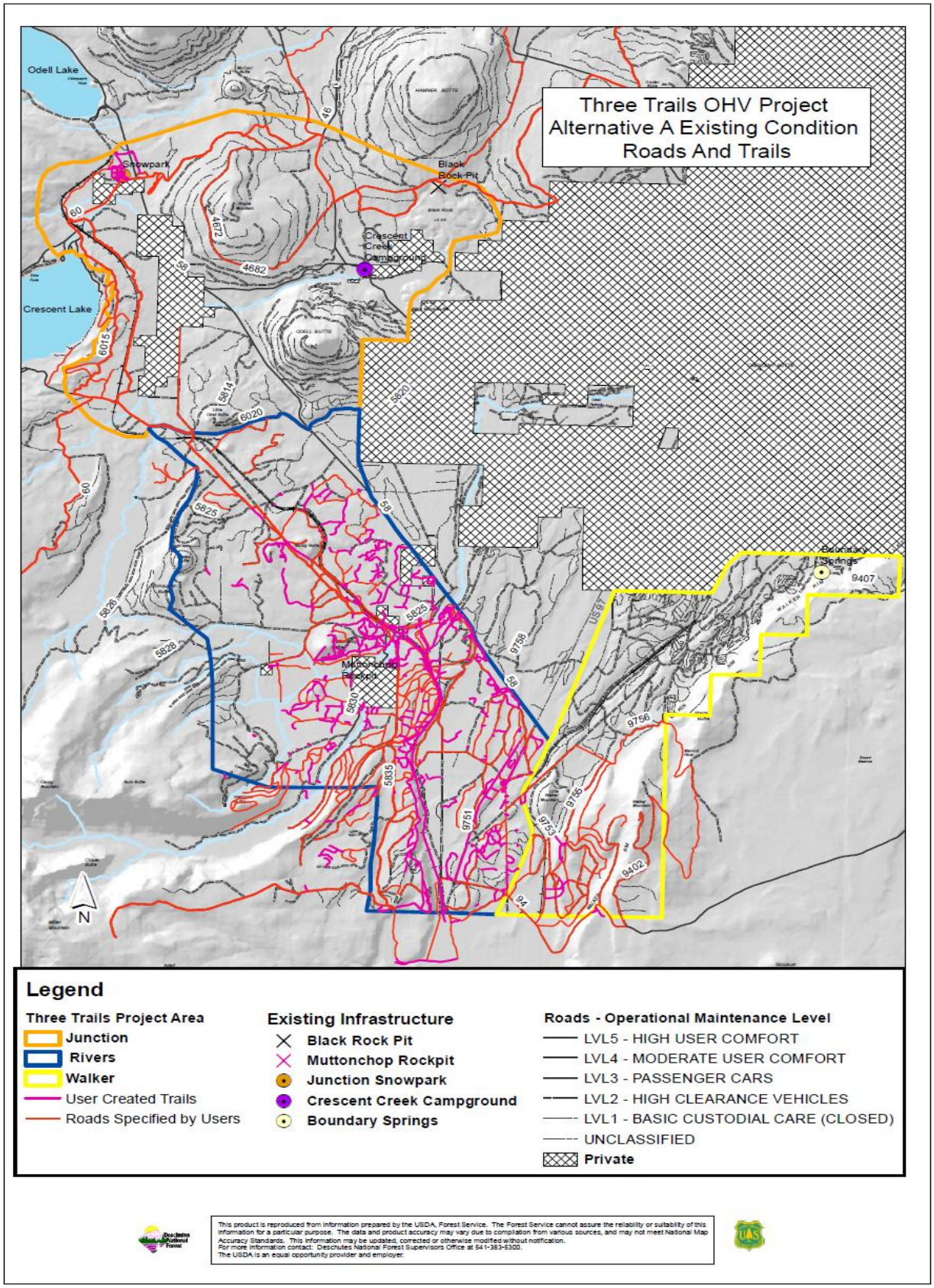


**Figure 2. Alternative A Existing Conditions**

**Common to all Action Alternatives**
Within the Three Trails OHV project area, all motorized travel off roads and trails that are designated for use, is prohibited. The upcoming Travel Management Motor Vehicle Use Map (MVUM) would be used to display open and closed roads and would be updated yearly to reflect the change in motor vehicle access within the project area. Motorized travel on Maintenance Level 1 roads and user-created trails, if not specified as an open route in one of the action alternatives, would be prohibited. Maintenance Level 2 roads that are not identified part of the open or closed routes in the action alternatives, would be open to motor vehicle travel.

Snag removal would be limited to danger/hazard trees along the trail and in staging areas.[8]

Wherever possible, new trail construction would be located to overlay existing snowmobile trails, existing user-created trails, and/or areas where vegetation and soil may be previously disturbed. Large trees would be avoided and removal of any size would be considered an occasional event. Where trees are required to be removed, the average diameter would be 6-8 inches.

Continual trail maintenance is an element of the action alternatives and includes condition surveys, trail logout for trees that create obstacles, trail grooming to redistribute soil material that has been displaced to the sides of the trails and maintain the surface of the trail tread, water bars for directing water off the trail, trail reconstruction, and sign and facility maintenance (such as pumping of toilets). Typically, a small tracked machine uniquely designed for OHV trail maintenance called a Sweco is used for trail maintenance activities. For more details, reference the Operation and Maintenance section in Chapter 3.

All trail locations are approximate and effects are based on the location moving 200 feet from centerline either side to avoid trees or other obstacles. The exception would be when a trail is on a road prism or adjacent to a sensitive area such as a cultural site or fen. The appropriate specialist would be involved in the on-the-ground identification of the trail location.

To varying degrees, each of the four Action Alternatives incorporates the use of National Forest System Roads to provide designated connectivity throughout the Analysis Area within and between portions of the designated trail system. A supplemental Engineering Analysis would be performed on portions of Roads 5825, 5830, and 6020 to determine what requirements would be necessary to allow for safe use by a mix of highway-legal and non-highway-legal vehicles. These shared use routes would also require more frequent maintenance such as blading of the travel way.

In order to establish connectivity for OHVs from the Walker area at the southern end of the analysis area to Crescent Lake Junction at its northern end, each alternative includes proposals for construction of a highway underpass beneath U. S. 97 just south of the U. S. 97/O.R. 58 interchange and a railroad crossing on the Union Pacific Railroad line east of the Two Rivers North subdivision. Subject to funding, implementation of these actions would entail applying for and securing a crossing permit from the Rail Division of the Oregon Department of Transportation (ODOT) and entering into an agreement with ODOT for construction of an underpass.

**Four Forest Plan Amendments are required.**
There are site-specific amendments to the Deschutes National Forest Land and Resource Management Plan (Forest Plan) as amended for Alternatives B through E in the proposed Three Trails Off-Highway

[8] 2009, personal communication with Scott McNew, COHVOPS specialists, regarding hazard tree felling at the 318 mile East Fort Rock designated OHV trail system. In general, dead trees along the trail system are not felled unless they lean out over the trail.

Vehicle (OHV) Project located within the Crescent Ranger District. The project area straddles the Northwest Forest Plan line and includes a wide range of Management Areas including Intensive Recreation (MA-11), Old Growth (MA-15), and Key Elk (Appendix 16, Habitat Area). See the section Forest Plan Amendments in Chapter 3 for more details.

**Forest Plan Amendments**

There are four site-specific amendments to the Deschutes National Forest Land and Resource Management Plan (Forest Plan) for Alternatives B-E.

1 and 2. In all alternatives, the project proposes to site-specifically amend Standards and Guidelines to authorize Class I and III (ATV and motorcycles) off-highway vehicle use by designating trails and an existing Sno-Park as a staging area in MA-11 (Intensive Recreation).

3. Management Area (MA-15) Old Growth- would change the Old Growth designation from Muttonchop Butte to a large block of mixed conifer habitat better suited for focal species goshawk and American marten. Total number of Old Growth designated acres would remain the same.

4. Key Elk area-(WL-45) the fourth amendment would shift the boundaries of a Key Elk area away from the Two Rivers North subdivision and into wetter, less roaded area that would provide more solitude which is better suited for elk. The overall acreage of the key elk area would stay the same.

## Alternative B

### Proposed Action

The proposal would provide approximately 110-130 miles of trails in three main areas with associated staging areas. Upon further detailed analysis utilizing Geographical Information System (GIS) data and on the ground information, the total trail mileage in Alternative B was determined to be approximately 143 miles. The main trail systems would be linked with shared use roads, railroad crossings, and the proposed underpass on Hwy 97. The trail system would vary in skill level and density to match the terrain and design of the staging areas, providing an opportunity for beginner through advanced riding experiences. Where redundant access exists, or user-created trails are in sensitive locations (such as within riparian resources or desired wildlife habitat), closure and rehabilitation/restoration would be performed on 56 miles of user-created trails. Restoration activities include fencing, soil decompaction, blocking (felling trees to obstruct passage), camouflaging, tree planting, and revegetation of native species. To balance the increase open road/trail density associated with a designated trail system, approximately 41 miles of roads would be closed[9]. The general season of use would be May 1 through October 31.

Roads, user-created trails, fire lines, snowmobile trails, and existing areas of disturbance such as skid trails provide existing travel corridors that would be the basis for most trails. Routes used to connect areas of higher density trails and communities such as the Crescent Lake area businesses would generally use roads currently open for high clearance vehicles (Maintenance Level 2). Over time, the converted roads and trails would be modified to provide varying experiences and difficulty levels. Some trails would be narrowed to accommodate exclusive use for motorcycle-type vehicles. Where trail densities are high and varying in difficulty, one-way “loops” would be provided. The trail system would be implemented in phases. The first phase would be signing of existing “open” and “closed” routes and trails. Areas would then be designed and constructed as part of this decision, as funding is available.

[9] This document serves as a roads analysis process. Reference the Transportation section and consistency with applicable laws, regulations, and policies in Chapter 3.

The proposed action would provide trail systems for all three classes of OHVs. They are classified into three standard categories:

**Class I: (**ATVs, three-wheelers and quads) vehicles 50 inches wide or less and dry weight of 800 pounds or less, have a saddle or seat, and travel on three or four tires.
**Class II:** vehicles (jeeps or other 4-wheel drive vehicles) more than 50 inches wide or having a dry weight of more than 800 pounds, but less the 8,000 pounds.
**Class III:** vehicles (motorcycles) riding on two tires with a dry weight of less than 600 pounds.

**Alternative B Associated Actions**
In order for Alternative B to be implemented, the following are associated actions:

- About five miles of currently closed Maintenance Level 1 roads would be opened and used for OHV routes for all classes of vehicles.
- About 41 miles of currently open Maintenance Level 2 roads would be closed (changed to Maintenance Level 1) to offset effects of the designated trail system. All Maintenance Level 1 roads would remain open for administrative access.
- About 12 miles of Maintenance Level 1 and 2 roads would be converted to trail for Classes I and III vehicles and eight miles for Class II vehicles.
- About 56 miles of user-created trails that are either located in inappropriate areas and/or are redundant would be closed and rehabilitated.
- About 56 miles of shared use roads for all classes of vehicles.
- An underpass for Highway 97 that links the Rivers and Walker segments.
- A new wildlife guzzler installed on Walker Mountain.
- Railroad crossing south of 5825 road.

The following is a detailed description of the Three Trails OHV system:

## *Junction*

Junction is the northern portion of the project area (34,968 acres) near the town of Crescent Lake Junction. This area focuses on Class I and III users and concentrates use around the staging area and the availability of services at Crescent Lake Junction, such as overnight camping or lodging. Junction Sno-Park would become a day use staging area. The Junction area would provide approximately 20-25 miles of looped trails for ATVs and motorcycles within a 135-acre designated area. This area uses existing snowmobile trails to access Crescent Lake Junction. Existing user-created trails within the Junction designated area would be utilized, but may be modified with new trails, to provide varying degrees of difficulty and/or for safety. In addition the following roads would be closed to all motor vehicle traffic to reduce the effects of the trail system: 4672200, 4672800, 4672060, 5814500, 5814700, 5815250, 5815700, 5815800, 5815900 at the private road junction, 6020500 at the 6020750 junction, 6100707, 6100725, and 6100740.

## *Rivers*

The Rivers area is the middle portion of the project area (38,897 acres) that includes Muttonchop Butte near the Two Rivers North subdivision and south to the district boundary. This area also focuses on Class I and III users with four areas of developed trails with a total of 80-100 miles across approximately 3,400 acres. Two Forest Plan Amendments are proposed to modify the Hemlock Key Elk Area and the Muttonchop Designated Old Growth Management Area boundaries to remove areas of high road/trail densities, a fire area, and/or poor quality habitat to include more appropriate areas. For example, a rock pit is currently located within a designated Old Growth boundary on Muttonchop Butte. The pit receives high use by the motorized community and provides marginal wildlife habitat. This proposal would move the entire designated Old Growth boundary to a more suitable location and include Muttonchop Butte pit

in the trail system. As in other areas, excess user-created trails that are not in suitable locations would be rehabilitated. In order to provide for safety and to provide a connection between the east and west portions of the Rivers trail system, a railroad crossing and an underpass for Highway 97 are proposed.

The Rivers Midway staging area (Area A) would be developed on the 5850150 road. The three to five acre facility would include camping, parking, toilets and off-loading ramps. Learner loops for children would be developed immediately adjacent to the facility and approximately five to ten miles of existing user-created trails and loops would be the basis for trail development adjacent to the Rivers staging area. There would be no OHV trails located within the Riparian Reserve along Hemlock Creek and the Little Deschutes River, and those that exist would be rehabilitated. However, to provide access to users who would like to enjoy the river for other non-motorized uses such as fishing, and bird watching, designated parking areas would be developed along with hiking trails along the river. All other user-created OHV trails in the riparian area would be rehabilitated. There would be no river or stream crossing constructed with this alternative and all such crossing would be on existing roads. Existing user-created crossings would be rehabilitated. Outside of the riparian areas, some user-created trails would be utilized for connections and loops. The 5852150, 5852100, and 5852180 roads would remain open for high clearance vehicles and OHV use, while roads 5852170, 5852050, 5850200, 5850240 and 5850280, would eventually be converted into a motorized trail system.

Area B is approximately 500 acres located to the south and east of Two Rivers North subdivision extending to the railroad. This area would consist of approximately eight miles of existing closed roads and three miles of existing user-created connecting trails. The designated routes and trails would not be altered or further developed and would provide a recreational experience that is different than the traditional trail system.

Area C is south of the staging area between the railroad and Highway 58, on the 5850200 road. Approximately 45-50 miles of Class I and III trails would be developed across this 2,754 acre area. Existing roads and user-created trails would be the basis for trail design in the area. These would be modified to provide variety and safety and would include single track and ATV trails. Roads that would remain for all vehicles that can negotiate high clearance roads include the 9751100, 9751200, 9751210, and 9751212. To provide linkage, those portions of the 9751100 and 9751200 roads that are currently classified as closed would be opened and converted to roads maintained for high clearance vehicles.

The Muttonchop Butte rock pit on the southern base of the butte would continue to be utilized for intensive OHV use. On approximately 410 acres around Muttonchop Butte (Area M), the proposal is to utilize user-created trails, with some newly developed trails and high clearance vehicle roads to provide approximately 25-30 miles of looped trails at varying levels of difficulty for OHV and motorcycle users. Existing trails may be altered or extended to provide difficulty, diversity, and safety. Structures, such as log rails, would be installed to define the boundaries and to maintain existing vegetative cover.

Currently, road 5830 through the Two Rivers North subdivision is for passenger automobiles only and the non-highway vehicle use is illegal. It is currently under Forest Service jurisdiction with an easement through the subdivision. The proposal is to change this road to "mixed use[10]" through a designation process that incorporates safety measures, such as signing.

Within the Rivers Area, to offset creation of additional trails and opening of roads to provide linkage, roads 5825010, 5825080 from the 5825000 to 5825200, 5825180, 5830600, 5830830, 5830870 from the 5830870 to the end of the road and 9700993 would be closed. The Rivers area would support the 10-Mile

[10] Mixed use roads are those routes shared by licensed and non-licensed motor vehicles. Shared use roads are similar except they have been specifically identified and designated in the Three Trails OHV trail system.

loop trail and provides access to the Mini-Buttes loop trails. Rivers South staging area would be semi-primitive staging area of 1-2 acres with no amenities.

### *Walker*

Walker is the portion of the project area (19,151 acres) that is east of Highway 97 and includes Walker Rim. While roads maintained for high clearance vehicles would be available to all OHV classes, the southern area would have developed trails for the Class II user. A seasonal closure would be in effect for the entire Walker Trail system for two weeks during the mule deer rifle season. However, those roads within the "green dot system" that have a green dot, which is designed to reduce big game harassment during hunting season, would remain open to all motor vehicles.

A staging area (Walker Midway) would be developed along the 9755060 near junction with the 9755. Access to viewpoints on Walker Mountain would be on Maintenance Level 2 roads from the Marmot Pass Road to reduce conflicts on the 94 road, where street legal vehicles are required. Approximately 12 miles of high clearance and formerly closed roads south of Little Walker Mountain (between the 9755 and 9753) would be converted to Class II trails. To reduce effects to a potential decrease in availability to an existing wildlife guzzler, a new guzzler would be placed off the 9755195 road. The following roads would be closed to alleviate road/trail densities associated with creation of the trail system: 9765760, 9765750, 9765720, 9768480, 9768479, 9768470, 9768457, 9768450, and 9768390.

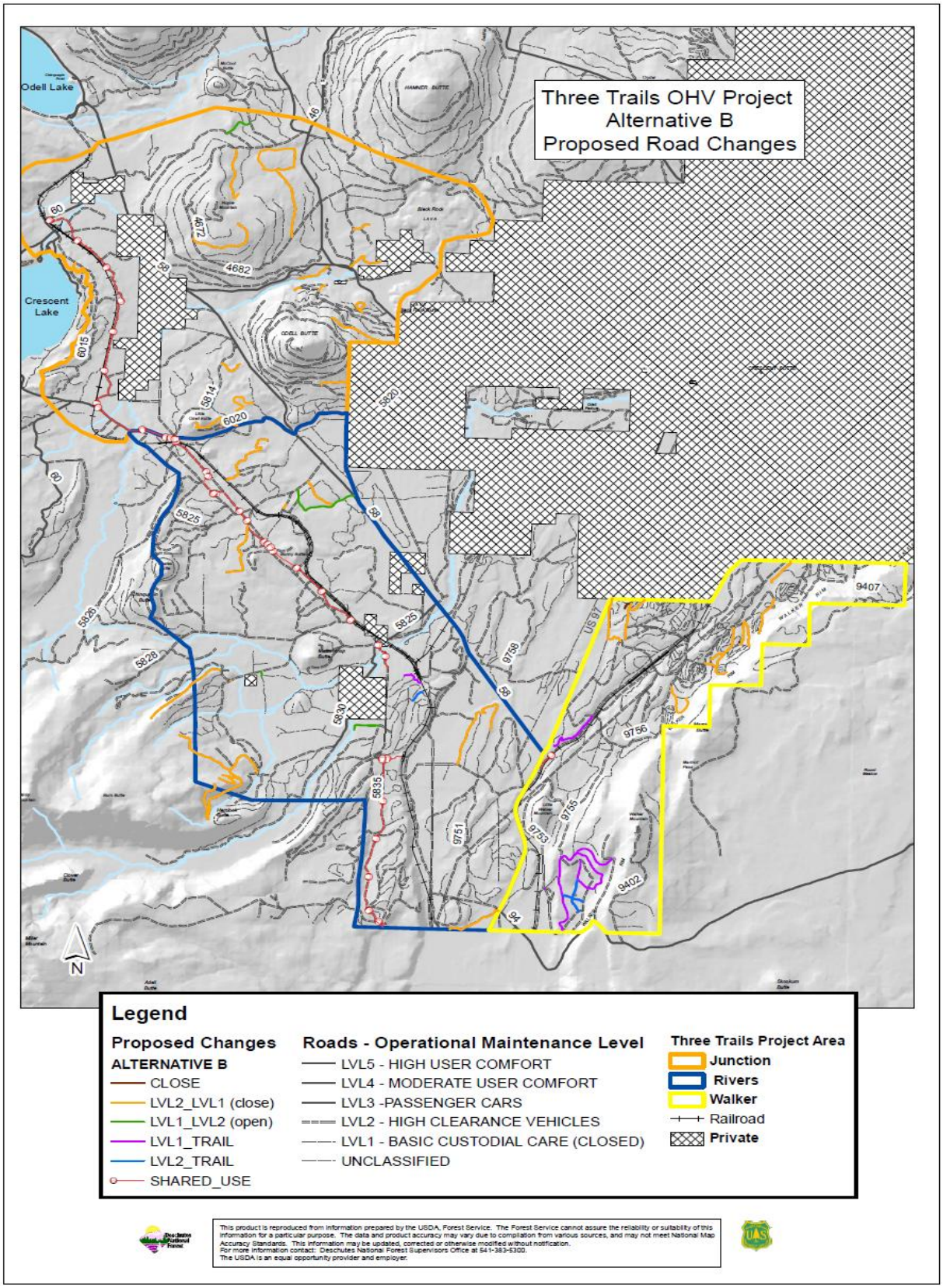


**Figure 3. Alternative B Roads**

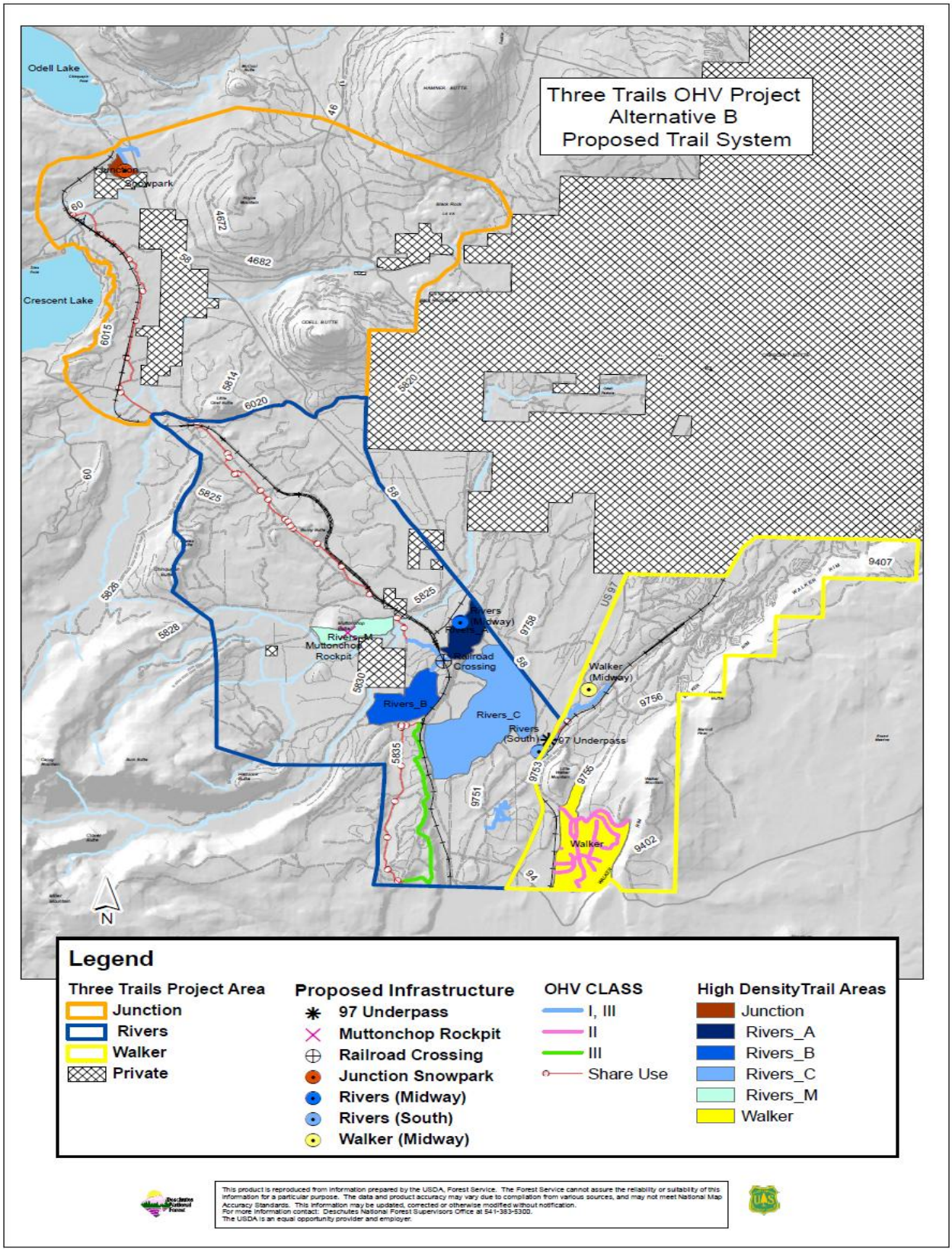


**Figure 4. Alternative B Trail System**

## Alternative C

This alternative responds to Key Issue #1 by providing a greater emphasize on rider's recreational experience**.** It also responds to Key Issue #4 by separating uses as much as possible on the Metolius-Windigo Trail. Alternative C uses a basic design from Alternative B by incorporating an interlinking trail system that accesses Crescent Lake businesses with a network of six strategically placed staging areas in the three areas (Junction, Rivers, and Walker). Ten miles of additional trail was added in more interesting terrain that accesses play areas at Black Rock and Muttonchop Butte Pits, as well as providing scenic vistas on Little Odell Butte, Black Rock, Royce Mountain, Railroad Ridge, Muttonchop Butte, and Walker Mountain. It offers longer rides with shorter loops back to the three hubs. As in all action alternatives, access to water is provided along the Little Deschutes River where riders can park and have a short walk down to the river. However, only in this alternative, riders can traverse the river on a bridge designed for ATVs or motorcycles. Non-motorized users can access the bridge as well. This alternative has approximately 153 miles of trails, including 53 miles of roads converted to trails[11], 118 miles of shared use[12] routes and 327 miles of Maintenance Level 2 roads (for high clearance vehicles) available for motorized use. Total route miles including shared use and engineered trails is 271 miles.

**Alternative C Associated Actions**

In order for Alternative C to be implemented, the following are associated actions:

- About five miles of currently closed Maintenance Level 1 roads would be opened and used for the OHV routes for all classes of vehicles.
- About 108 miles of currently open Maintenance Level 2 roads would be closed (changed to Maintenance Level 1) to offset the effects of a designated motorized trail system. All Maintenance Level 1 roads would remain open for administrative access.
- About 53 miles of Maintenance Level 1 and 2 roads would be converted to trail.
- About 90 miles of user-created trails that are either located in inappropriate areas and/or are redundant would be closed and rehabilitated.
- About 118 miles of shared use roads for all vehicle classes.
- Motorized and non-motorized uses would be separated as much as possible, except in wet areas (riparian reserves/RHCA) of the two-mile stretch of the Metolius-Windigo trail, by paralleling wherever possible. Equestrians, hikers, mountain bikers, and motorized users would continue to share portions of the trail due to limited options caused by terrain, land ownership, and proper riparian function of the wet areas. Signing would be used to encourage respectful behavior by all users.
- An underpass for Highway 97 that links the Rivers and Walker segments.
- A new wildlife guzzler installed on Walker Mountain.
- A day use parking area with non-motorized trail to the Little Deschutes River.
- Railroad crossing south of 5825 road.
- A new ATV bridge that crosses the Little Deschutes River.

## *Junction*

Within the Junction segment there would be 36 total trail miles that would include approximately eight miles of trails in and around Junction Sno-Park. This would overlay the area already in use by winter snowmobilers. Shared use routes for Class II (jeeps and other 4-wheel drive vehicles) opportunities connect the Junction Sno-Park to Black Rock Pit and around Royce Mountain with some interconnecting routes and trail loops. Access is also provided to Crescent Creek Campground and Simax Group

[11] Conversion of a road into an engineered trail uses the entire prism of the roadbed to engineer more of a trail experience by narrowing the track and creating meanders and topographic relief with an undulated surface.

[12] Shared use roads are those routes shared by licensed and non-licensed motor vehicles and they have been specifically identified and designated in the Three Trails OHV trail system.

Campground at Crescent Lake. Routes are provided to ATVs and motorcycles around the base and to the top of Little Odell Butte, avoiding the industrial camp for mushroom harvesters. Staging would radiate from Junction Sno-Park where there is a paved surface, a warming shelter with tables, and bathrooms. There are opportunities for overnight stays provided at the nearby Crescent Lake Resort, Odell Lake Resort, and at Forest Service campgrounds at Crescent and Odell Lakes. For the Junction portion of Three Trails, there are 18 miles of trail for ATVs and motorcycles and six miles of roads converted to trails. Jeeps and other 4-wheel drive vehicle opportunities, access to Black Rock Pit and its scenic overlook is provided on shared use routes from Crescent Creek Campground and Crescent Lake Junction. These routes would traverse the base of Royce Mountain and link 12 miles of new trail and roads converted to trail specifically engineered for Class II vehicles (jeeps and other 4-wheel drive vehicles).

### *Rivers*

Rivers sub-area would contain 80 total trail miles. The routes in this area can be characterized as (generally) large loops interconnected by a combination of trails and shared use roads. Muttonchop Butte pit play area would be available using the 5830 road and utilizing existing trail where possible. A crossing of the Little Deschutes River by a new bridge is included. There would be three staging areas including Rivers North, Rivers Midway, and Rivers South. This section has 47 miles of trail for ATVs and motorcycles that include 21 miles of roads converted to trails. Total single track trail for motorcycles is 12 miles, including three miles of roads converted to trail. An underpass on Highway 97 would connect Rivers to the Walker area.

### *Walker*

The Walker segment would contain approximately 37 total trail miles including 12 miles designed specifically for jeeps and four-wheel drive vehicles. There is also a 37 mile perimeter trail for ATVs and motorcycles that would be created utilizing a combination of existing roads and trails (user-created and newly constructed). Due to the higher density of trails and roads in the Rim area, there is a spring seasonal closure for big game fawning and calving season between May 1 and June 15. There would be two staging areas included: Walker Midway and Walker South. Boundary Springs is the camping area that would be connected to the trail system. Viewpoints include: Walker 100Rd and Walker 200Rd. In this area, Walker Rim is the attraction for many people, and several high clearance roads that access the rim would remain open for the use of Class II (jeeps/4-wheel drive) vehicles.

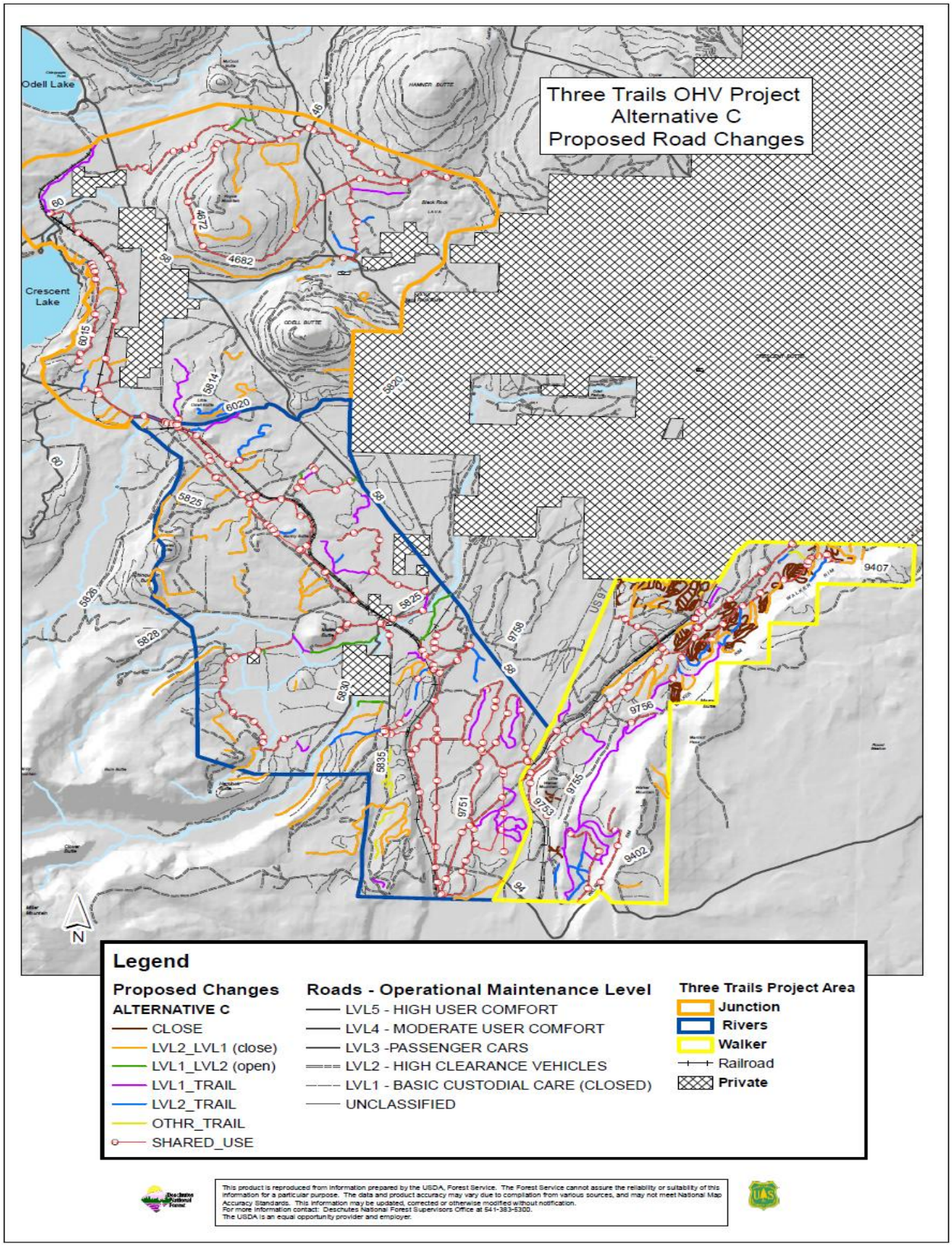


**Figure 5. Alternative C Roads**

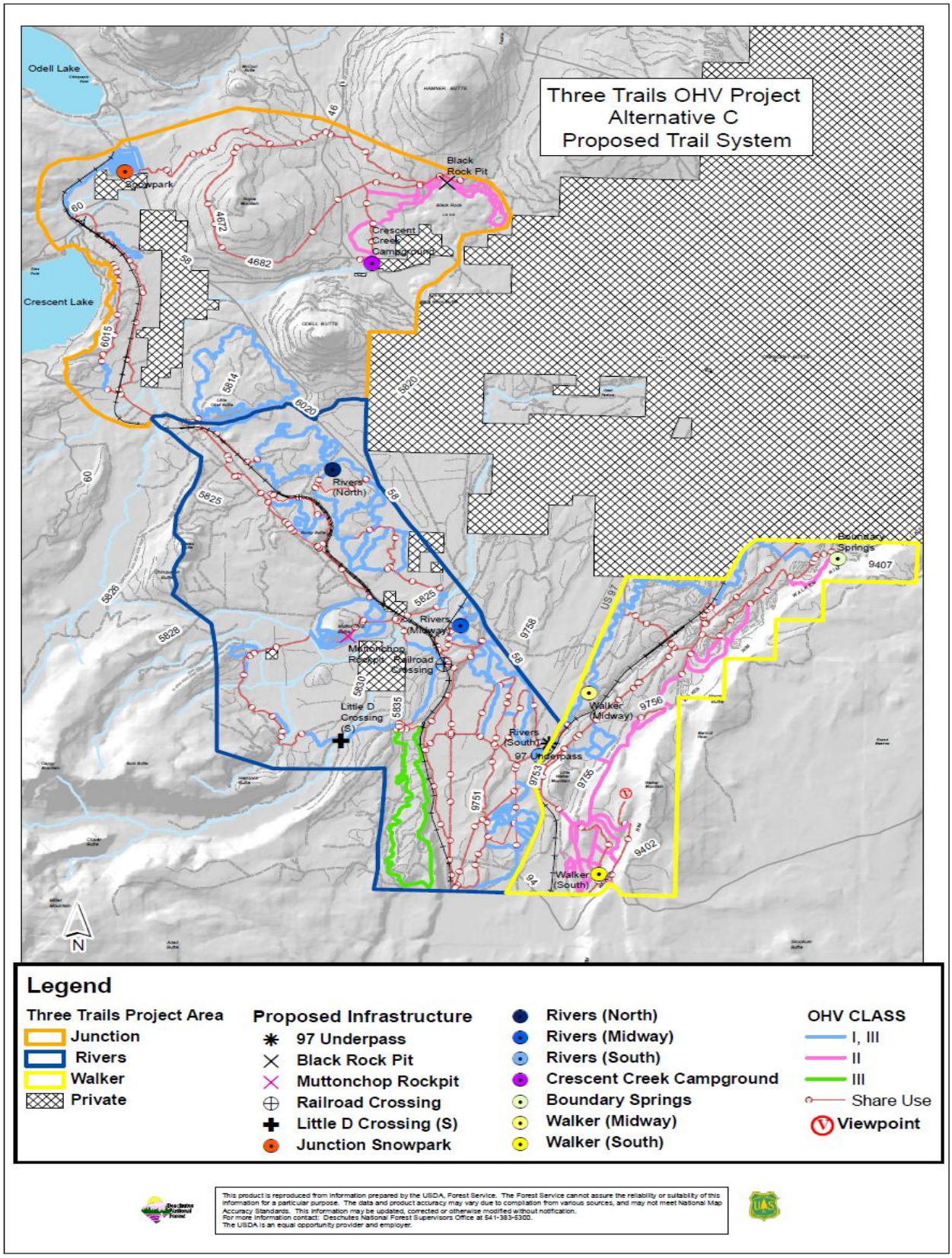


**Figure 6. Alternative C Trail System**

## Alternative D

This alternative was developed in response to Key Issue #2 by providing more effective mule deer and elk summer range, calving/fawning areas, and migration corridors. It also responds to Key Issue #3 by prohibiting motor vehicle use in the Muttonchop Butte play pit and moving trails to dampen potentially related noise to adjacent residences. It also responds to Key Issue #4 by separating uses as much as possible on the Metolius-Windigo Trail. This alternative is characterized as having more tightly concentrated loops away from the big game migration routes and private property, as compared to Alternative C. It also has four strategically placed staging areas in Junction, Rivers, and Walker trail systems. Compared to Alternative B, this alternative has a total of 13 additional trail miles and has scenic vistas on Little Odell Butte and Railroad Ridge. There is foot trail access to water along the Little Deschutes River; however no bridges would be constructed with this alternative. There would be 109 miles of engineered trails and 42 miles of roads converted to trails for a total of 151 miles. In addition there are 56 miles of shared use roads for a total 207 route miles.

**Alternative D Associated Actions**

In order for Alternative D to be implemented, the following are associated actions:

- About three miles of currently closed Maintenance Level 1 roads would be opened and used for the OHV routes.
- About 114 miles of currently open Maintenance Level 2 roads would be closed (changed to Maintenance Level 1) to off-set creation of engineered trail. All Maintenance Level 1 roads would remain open for administrative access.
- About nine miles of currently open Maintenance Level 2 roads would be converted to trail.
- About 95 miles of user-created trails that are located in inappropriate areas, are redundant, or otherwise unneeded, would be closed and rehabilitated.
- About 56 miles of shared use roads for all classes of vehicles.
- Motorized and non-motorized uses would be separated as much as possible except in wet areas (riparian reserves/RHCA) of the two-mile stretch of the Metolius-Windigo trail, by paralleling wherever possible. Equestrians, hikers, mountain bikers, and motorized users would continue to share portions of the trail due to limited options caused by terrain, land ownership, and proper riparian function of the wet areas. Signing would be used to encourage respectful behavior by all users.
- An underpass for Highway 97 that links the Rivers and Walker segments.
- A new wildlife guzzler installed on Walker Mountain.
- A day use parking area with non-motorized trail to the Little Deschutes River.
- Railroad crossing south of 5825 road.

## *Junction*

The Junction area includes 16 miles of trail, which includes eight miles of trails in and around Junction Sno-Park. This would overlay the area already in use by winter snowmobilers. There is access to the snowmobile underpass (off -625 spur) so riders can access the businesses on the north side of Hwy 58. There are no play areas (i.e. mineral pits) in this segment. In the Junction area, Little Odell Butte offers scenic vistas with a trail for ATVs and motorcycles. As in all the action alternatives, there would be one day use staging area at Junction Sno-Park and one group camping area at Simax.

## *Rivers*

The Rivers segment includes 121 miles of trail. Muttonchop Butte pit play area is not included in this alternative; however Quarry 2011 in the Rivers OHV trail segment was incorporated as a play area near the proposed Highway 97 underpass. In this alternative, 5830 loop is not available for all classes unless they are street legal. There are two staging areas in this segment, Rivers North and Rivers South.

Railroad Ridge viewpoint is in this segment. There would be no river or stream crossing constructed with this alternative and all such crossing would be on existing roads.

### *Walker*

In order to maintain big game habitat effectiveness, this alternative has the least amount of miles of trails available in this segment (14); however 10 of the 14 miles have been designed specifically for jeeps and 4-wheel drive vehicles. Staging areas include Walker South and access to Boundary Springs for camping. As in all the alternatives, all roads that are maintained for high clearance vehicles (Maintenance Level 2) are available for all class of vehicles. There is one designated scenic viewpoint along the Walker 200 road.

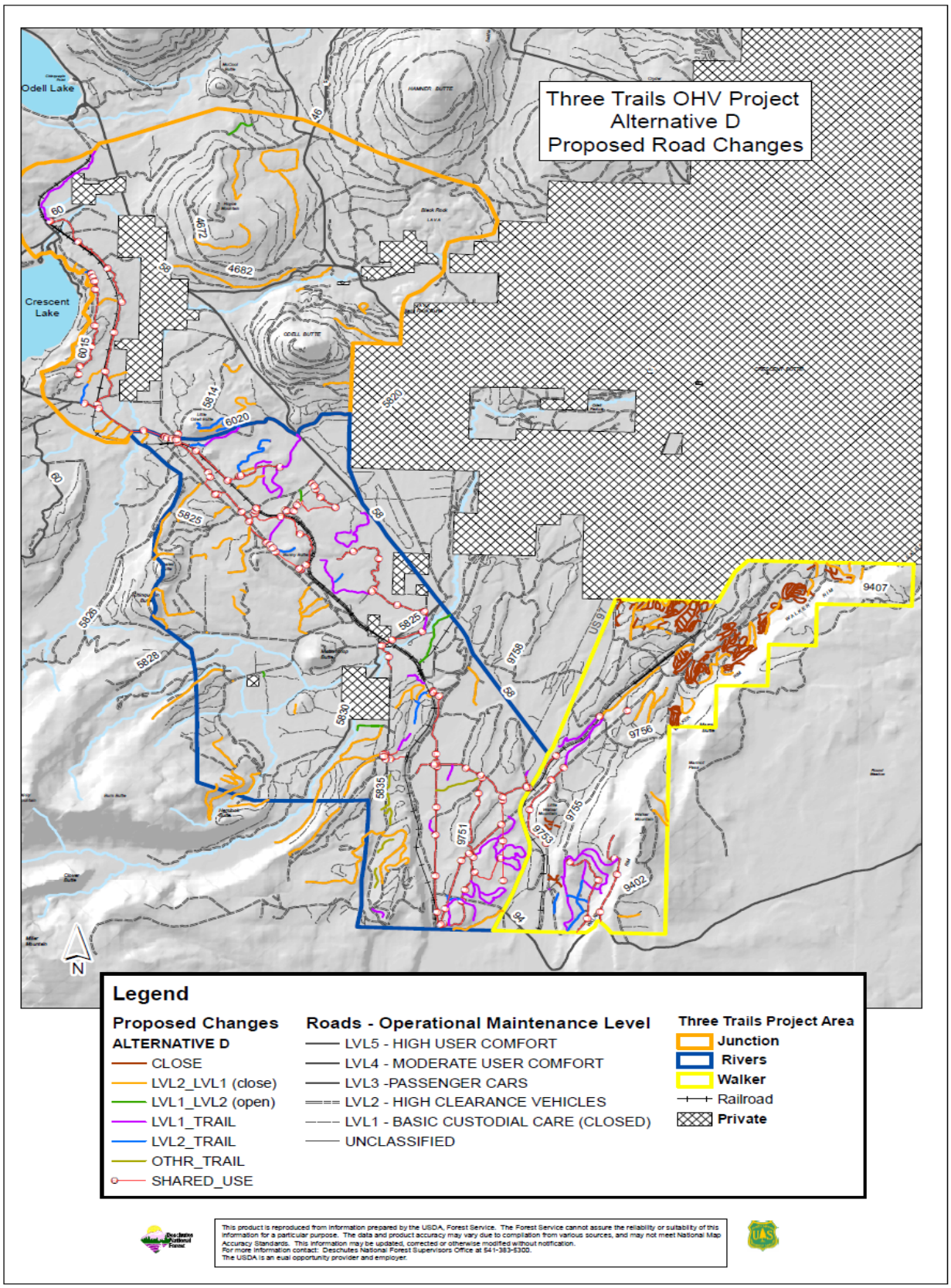


**Figure 7. Alternative D Roads**

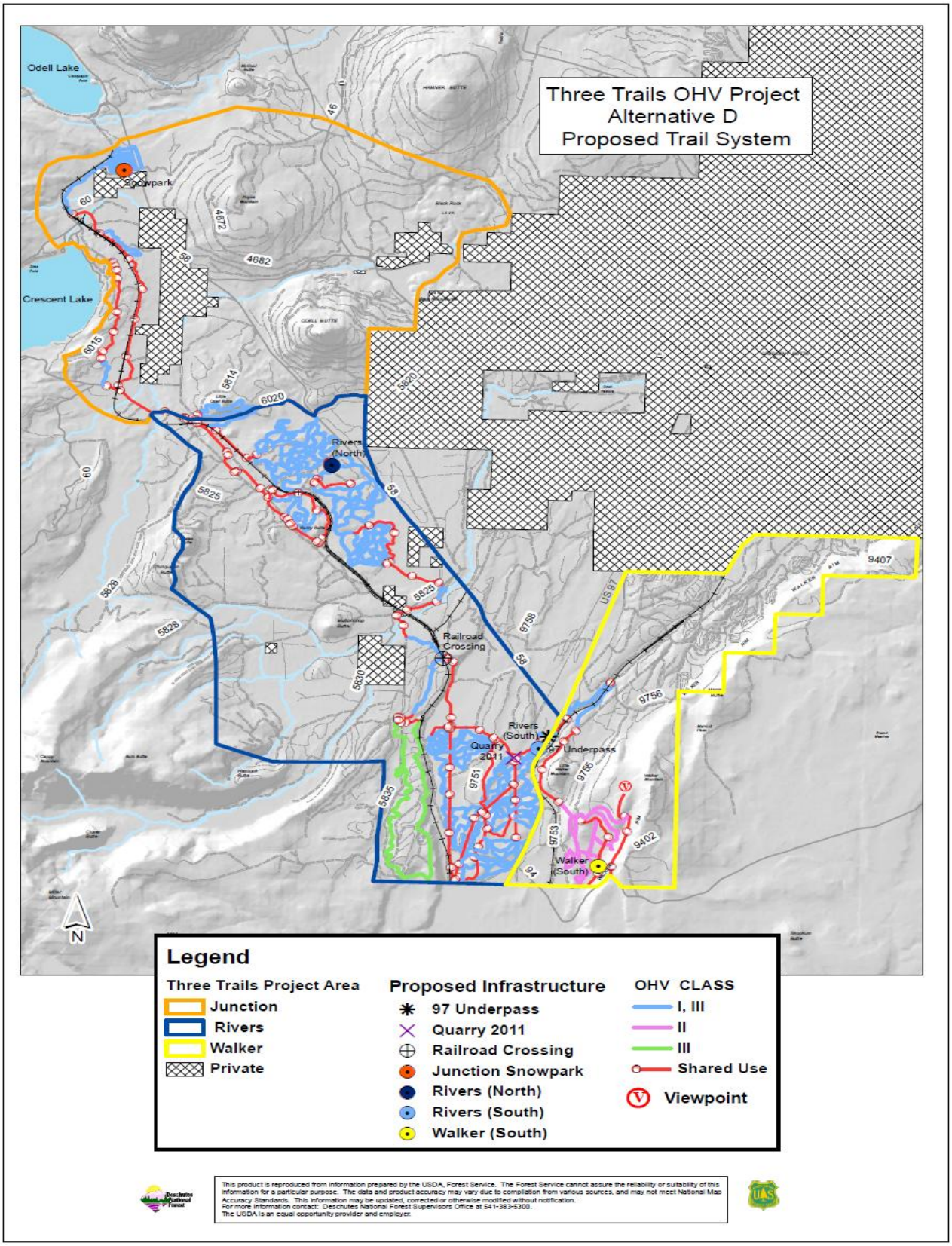


**Figure 8. Alternative D Trail System**

## Alternative E

This alternative also responds to Issue #1 by incorporating most of the design features that the riders requested (longer loops, interconnected trail systems, access to public goods and services) as in Alternatives C and D, but it also blends Issue #2 by providing some tighter loops in some areas and avoiding an extensive trail system where big game migration corridors are more likely to occur. It also responds to Key Issue #4 by separating uses as much as possible on the Metolius-Windigo Trail. There are also four staging areas as in Alternative D. This alternative offers all the scenic viewpoints as in Alternative C, except on the Walker 100 road. The total trail miles equals 142; plus 80 miles of connecting high clearance roads for a total 222 route miles. This includes 21 miles of trails engineered for Jeeps and other 4-wheel drive vehicles.

**Alternative E Associated Actions**

In order for Alternative E to be implemented, the following are associated actions:

- About five miles of currently closed Maintenance Level 1 roads would be opened and used for OHV routes.
- About 115 miles of currently open Maintenance Level 2 roads would be closed (changed to Maintenance Level 1) to offset ceffects of designation of motorized trails. All Maintenance Level 1 roads would remain open for administrative access.
- About 43 miles of currently open Maintenance Level 2 roads would be converted to trails; 32 miles for Class I and III vehicles and 11 miles for Class II vehicles.
- About 94 miles of user-created trails that are located in inappropriate areas and/or are redundant would be closed and rehabilitated.
- About 80 miles of shared use roads for all classes of vehicles.
- Motorized and non-motorized uses would be separated as much as possible except in wet areas (riparian reserves/RHCA) of the two-mile stretch of the Metolius-Windigo trail, by paralleling wherever possible. Equestrians, hikers, mountain bikers, and motorized users would continue to share portions of the trail due to limited options caused by terrain, land ownership, and proper riparian function of the wet areas. Signing would be used to encourage respectful behavior by all users.
- An underpass for Highway 97 that links the Rivers and Walker segments.
- A new wildlife guzzler installed on Walker Mountain.
- A day use parking area with non-motorized trail to the Little Deschutes River.
- Railroad crossing south of 5825 road.

## *Junction*

This segment has the highest total trail miles (41) of all the alternatives, which includes seven miles for Jeeps and other 4-wheel drive vehicles at Black Rock Pit. As in Alternative D, there would be approximately eight miles of trails in and around Junction Sno-Park. Scenic vistas and viewpoints in Junction include a trail to the top of Little Odell Butte, Royce Mt 1, Royce Mt 2, Royce Mt 3, and Black Rock Pit overlook. A six mile loop around the base of Little Odell Butte would be designated and designed for motorcycles (single track) only. As in all the action alternatives, there would be one day use staging area at Junction Sno-Park and access to the group campground at Simax. In addition to the 41 miles of trail, 80 miles of connecting high clearance roads brings the total route miles to 121.

## *Rivers*

This segment has 87 miles of trail. It is characterized as a larger, more open loop system to the north (compared to Alternative D) and has tighter more concentrated system to the south. Although Muttonchop Butte pit play area is included in this alternative, the closest trail to Tall Pines subdivision (west of Mowich) has been moved to the same location in Alternative D, to dampen potential noise. As

in Alternatives D, there would be two staging areas located at Rivers North and Rivers South. Viewpoints included in this segment include Muttonchop Butte and Railroad Ridge. There would be no river or stream crossing constructed with this alternative and all such crossing would be on existing roads. An underpass on Highway 97 would connect Rivers to the Walker area.

### *Walker*

This segment includes 14 miles of trail, which includes 10 miles of trail for jeeps and other 4-wheel drive vehicles in the southern portion of Walker. There would be one staging area at Walker South. There is a scenic viewpoint located on the 200 road.

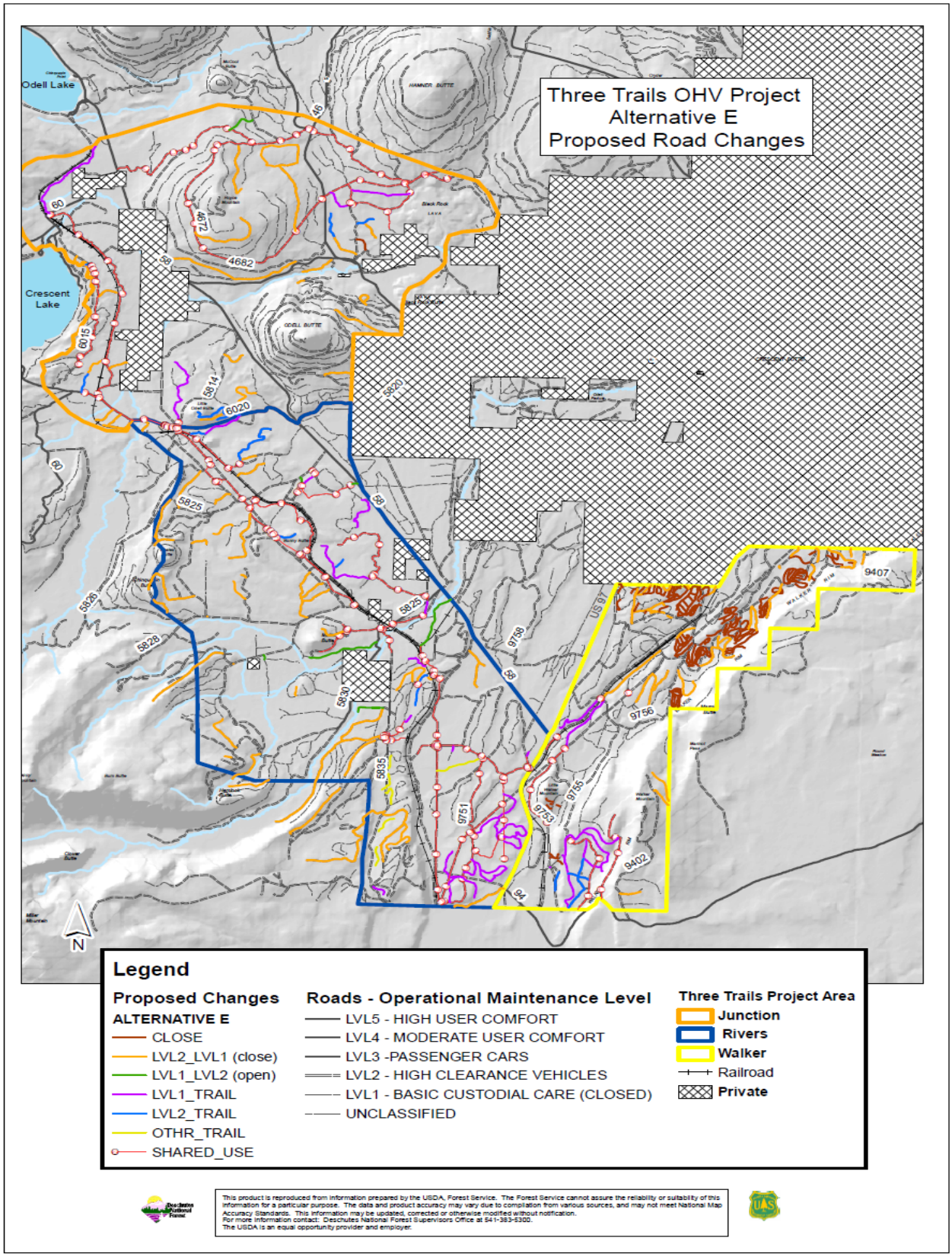


**Figure 9. Alternative E Roads**

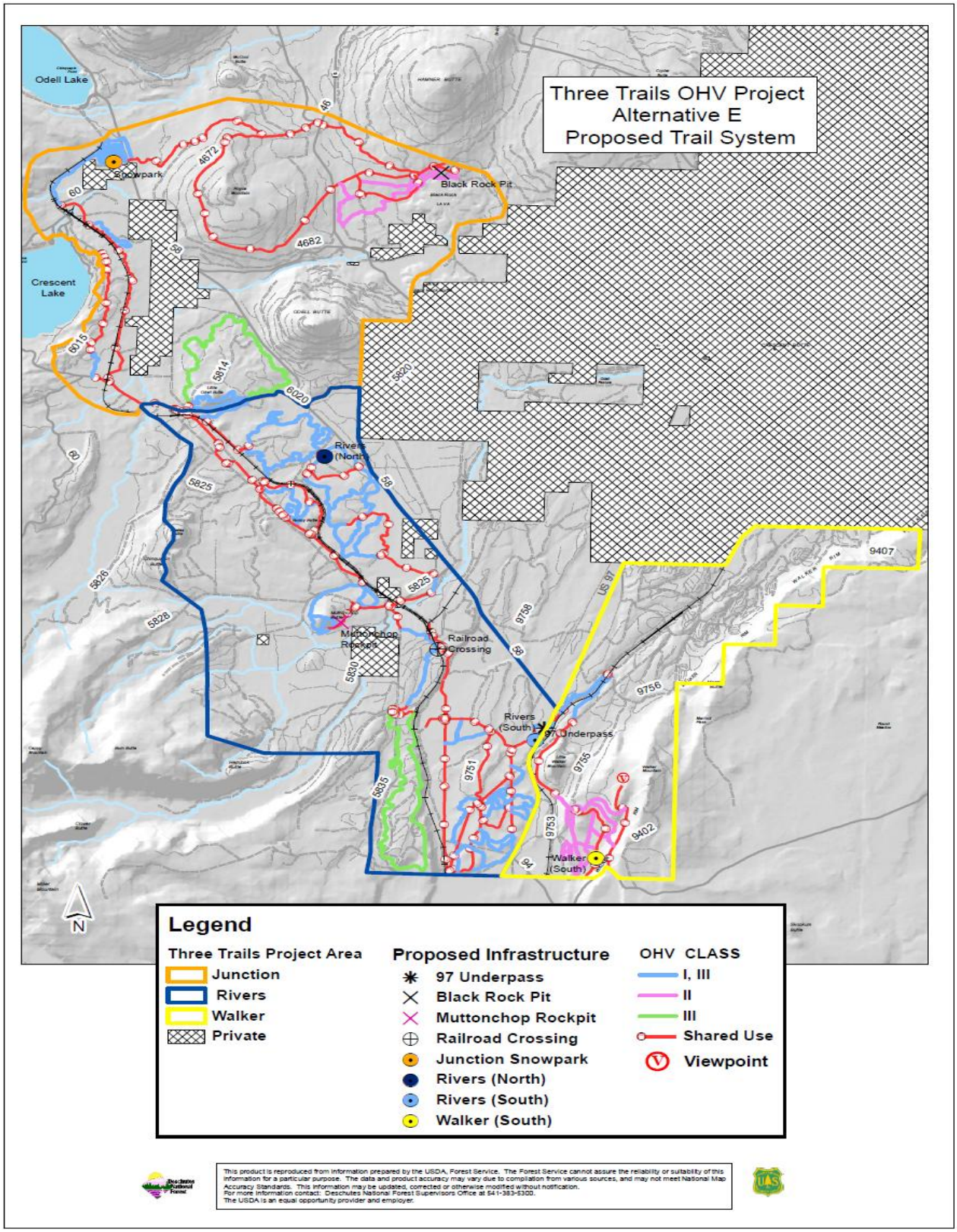


**Figure 10. Alternative E Trail System**

# Resource Protection Measures

The following features are incorporated into the design of alternatives. Project Design Features are sideboards and assumptions that were used in development of specific alternatives. Mitigation measures are those that are site specific, usually have a specific unit(s) assigned to them, and are used to avoid, minimize, rectify, reduce, or compensate an impact (40 CFR 1508.20). For example, a Project Design Feature may include a seasonal closure for an unknown nest site (if discovered); a mitigation measure would place a seasonal closure on a known nest site specific to a trail system. Project Design Features and mitigation measures are used as a basis for determining and disclosing effects in the Environmental Consequences discussions.

## Project Design Features Common to all Alternatives

***Riders Experience and Safety***

All trails would be designed with safety in mind by incorporating techniques such as curves, turns, and obstacles that discourage excessive speed.

In the Junction segment, access to the snowmobile underpass (off -625 spur) would be provided.

An underpass on Hwy 97 south of the junction of Hwy 97 and Hwy 58 would be built to allow safe OHV passage connecting Rivers and Walker areas. This underpass would be designed to include connectivity of wildlife habitat. This would be phased in when funding is attained. A Wildlife Biologist would work in conjunction with state highway engineers to design an appropriate underpass system to accomplish all objectives.

For safety, there would be a railroad crossing provided off the 5825260 spur near the Two Rivers North subdivision.

For aviation safety, the Crescent Lake Airport is not used for OHV routes.

In the Junction segment, connections to the local businesses at Crescent Lake Junction are provided by a shared-use portion of the Metolius-Windigo Horse trail from the snowmobile underpass to the 60 road for approximately a two mile segment of trail. This segment is very limited in options and all uses must share the only safe undercrossing at Highway 58; therefore the trail would be designed and signed to accommodate both motorized and non-motorized uses as much as possible while providing safety and water quality proximate to wet areas near the railroad tracks.

As a result of comment from the residents of Two Rivers North, all action alternatives have located all staging areas and most trails away from the subdivision.

***Matsutake production***

Information obtained during the scoping period from those who advocate matsutake (mushroom) production and harvesting would be utilized during layout of the trails (and prior to trail construction) to avoid, where feasible, matsutake and sugarstick (*Allotropa virgata)* plants. (The latter species is used as an indicator for matsutake when the mushrooms are not fruiting). A botanical survey would be conducted by a botanist prior to any new trail construction to avoid these two plant species when feasible.

***Botanical***

In areas near fens or wetlands, structures such as split rail fencing and boulders would be utilized to define the boundaries of the designated trail system.

***Big Game Habitat Effectiveness***

After consideration of access for activities such as recreation, mushroom harvesting, and administrative use (including fire suppression), approximately 218 miles of legacy roads inherited from a land exchange, formerly used for intensive harvest practices, would be closed to motorized use in the Northeast corner of the Walker segment. This segment includes a very high density of roads that generally are located on acquired lands that were formerly managed for industrial forestry. These roads have been in a special status without a maintenance strategy assigned. This project, using a roads analysis to be informed, took advantage of an opportunity provided by an integrated analysis from a landscape scale.

To offset a potential decrease in availability to an existing wildlife guzzler, a new guzzler would be placed off the 9755195 road on Walker Rim.

The Walker Green Dot Cooperative Road Closure Agreement would remain in effect for all action alternatives during the fall deer rifle hunting season. All motorized use including OHVs are restricted to utilizing only those roads posted with a "Green" Dot.

OHV travel off designated roads and trails would not be permitted for any reason, including big game retrieval during the hunting seasons.

To the greatest extent possible, OHV trails would be routed away from all water sources to minimize disturbance to wildlife.

To the greatest extent possible, OHV trails would be routed away from big game hiding cover patches to minimize motorized harassment to deer and elk.

The boundary of the Hemlock Key Elk Area (KEA) would be adjusted to incorporate more wet meadow habitat and reduce the open density as compared to the existing condition. There would be no change in the amount of acreage allocated as KEA.

There would be no OHV trails constructed that would traverse lava pressure ridges and/or lava flows such as the Black Rock lava flow south of Hamner Butte.

***Wildlife/Birds***

Active nest sites would be protected from disturbing activities within ¼ mile of nest by restricting site disturbance during periods of nesting. Disturbing activities would vary site specifically. An evaluation of potential disturbance would be done by a biologist prior to planned activities should a nest be encountered.

Snag removal would be limited to danger/hazard trees along the trail and in staging areas.

**Table 2. Seasonal Restrictions on Trail Construction and Maintenance Activities near Active Nest Sites, Wolverine Dens, and Big Game Calving/Fawning Habitat**

| Species | Buffer Distance | Restricted Season |
|---|---|---|
| Northern spotted owl (nest) | ¼ mile (most activities) or ½ mile (helicopter operations) | March 1–August 31 |
| Northern bald eagle (nest) | ½ mile (line-of-sight) or<br>¼ mile (non line-of-sight) | January 1–August 31 |
| Bald eagle (winter roost) | To be determined by a district wildlife biologist | November 1 – April 30 |
| Goshawk (nest) | ¼ mile | March 1- August 31 |
| Osprey (nest) | ¼ mile | April 1 – August 31 |

| | | |
|---|---|---|
| Red-tailed hawk (nest) | ¼ mile | March 1 – August 31 |
| Sharp-shinned hawk (nest) | ¼ mile | April 15 – August 31 |
| Cooper's hawk (nest) | ¼ mile | April 1 – August 31 |
| Great gray owl (nest) | ¼ mile | March 1 – June 30 |
| Great blue heron (nest) | ¼ mile | March 1 – August 31 |
| Wolverine (den) | 2 miles | February 1 – May 30 |
| Deer and Elk (fawning/calving habitat)[13] | To be determined by wildlife biologist | May 1 – June 30 |

***Exclusive to Alternative C:***

Due to the more extensive trail system in Alternative C on Walker Rim, the designated Walker OHV trail system east of Highway 97 would have a limited operating period prohibiting OHV use from May 1 through and including June 15 each year to minimize disruption of the spring mule deer migration period.

***Soil and Water Quality[14]***

Wherever possible, all trails would be located to overlay existing snowmobile trails, existing user-created trails, and/or areas where vegetation and soil may be previously disturbed.

In order to maintain soil quality and to ensure maintenance of a quality trail riding experience for the users, season of use would generally be from May 1 through October 31.

All routes and staging area would be designed and located to minimize erosion by maintaining proper drainage systems.

Tread hardening systems (e.g. angular three inch diameter quarry rock), or materials and treatments that would achieve the same goal of protecting the tread would be installed wherever tread grade is less than two percent and water tends to pool.

New trail segments would not be constructed directly up steep slopes. Sustained grades would not exceed 12 percent, and the maximum trail grade of any trail segment would not exceed 30 percent. This would reduce the capacity of the trail to capture and channel runoff.

All trail construction in or near wet areas would be avoided, wherever possible. When unavoidable, install wooden puncheons (an artificial tread elevated above the ground) across wet or swampy areas.

Downed wood cleared to create the trail tread would remain onsite and positioned to discourage OHV users from straying off the designated trail tread.

Very little trail construction would occur within riparian reserves. However, when unavoidable, all existing large woody debris would be retained within riparian reserves to provide nutrients and food to aquatic plants and insects, and provide terrestrial buffering to retard sediment-rich runoff from entering the stream network.

All rehabilitation work areas would be revegetated with native species following disturbance. Erosion filtering fencing would be placed to control offsite movement of soils in rehabilitation areas adjacent to perennial streams.

[13] Alternative C only

[14] Additional Project Design Features common to trail construction are found under the heading "Operation and Maintenance Guidelines" in Chapter 3.

All routes and staging area would be designed and located to minimize erosion and potential sedimentation with drainage systems designed for the appropriate location and maintained over time. They also would be well away from surface water to prevent potential contamination from hazardous materials.

***Exclusive to Alternative C:***

Construction of the bridge over the Little Deschutes River would use full suspension of bridge stringers to minimize footprint within riparian-associated vegetation.

All approaches to the new ATV bridge would be designed with hardened surfaces to reduce potential fugitive dust and sedimentation from entering the waterway of the Little Deschutes River.

***Exclusive to Alternatives B, C, and E:***

Wood fencing or other similar structures would be used to contain the area of activity at Muttonchop Butte and retain the current vegetation.

***Cultural***

If, during trail construction, any cultural artifacts or featuers are discovered, work would be halted until the archeologist can review the site.

Where a road is converted to trail through a site, the narrowing of the trail would be accomplished by methods that maintain the integrity of the site below the surface of the road bed.

***Invasive Plant Prevention***

Actions conducted or authorized by written permit (contracts) require cleaning of all heavy equipment (i.e., bulldozers, skidders, and other construction equipment) prior to entering National Forest lands.

All Forest Service employees would inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and personal equipment prior to leaving a project site infested with weeds.

Inspect gravel, fill, sand stockpiles, quarry sites, and borrow materials for invasive plants before such material is transported and used within National Forest lands. Only gravel, fill, sand, and rock that are certified to be weed-free would be used within the project area.

Only certified weed-free straw would be used when mulching material is required for trail and road rehabilitation projects.

Native seed and plant materials would be used for all restoration and rehabilitation projects.

Any OHVs used for trail construction would be free of mud, dirt, and plant parts prior to entering the project area.

***Public Safety and Scenery***

Smoke and smoke drift from prescribed maintenance burns for Rim-Paunina[15] has potential to overlap the Three Trails OHV designated trail system. If that occurs, portions of the trail system would be closed on burn days due to reduced visibility and exposure to prescribed burning operations. Public notification

[15] Rim-Paunina is a project focusing on developing and maintaining a diversity of wildlife habitats that are appropriate for the dry eastside forests in the Walker Mountain area on the southern end of Crescent Ranger District.

would include information on the central Oregon website, signing, and presence of field rangers at staging areas and affected trail systems until the hazard is abated.

Timber harvest and activities associated with timber haul has the potential to overlap the Three Trails OHV project area. If this occurs, portions of the trail system and shared use roads may be temporarily closed during operational periods of the timber harvest (such as felling and hauling operations) for a period up one year. Public notification would include information on the central Oregon website, signing, and presence of field rangers at staging areas and affected trail systems until the hazard is abated.

In order to assure scenery is maintained along major travel corridors, maintain visibility of riders, staging areas, and designated routes as subordinate to the surrounding landscape. During on-the-ground layout of trail system and routes, take advantage of vegetation screening and topography. Ensure all routes that may be visible are perpendicular in order to minimize the time seen on major travelways.

A mixed use analysis for sharing all potential motorized traffic has been performed to establish the suitability of allowing mixed use on roads in the context of their current setting in terms of alignment, width, typical user speed, and presence or absence of traffic control devices. On all shared use routes within the Three Trails OHV Project area, confirmation signing for the presence of OHVs would be installed.

## Project Design Features Common to Action Alternatives C, D, and E

***Riders Experience and Safety***

In order to provide access to the Simax Group Campground at Crescent Lake, a connection would be provided with an OHV trail out from Simax Group Campground to connect to road 6015.

To provide access to the Little Deschutes River, there would be a designated native surface day use parking and non-motorized trail provided.

To provide access to a popular user-created motorcycle single track trail called the “10-mile loop”, it is incorporated into the Rivers segment utilizing existing trail, closed roads, and some new trail construction.

## Project Design Features Common to Action Alternatives B, C, and E

Alternatives B, C, and E, in which use at Muttonchop Butte Play Area is authorized, the Forest Service would enforce a quiet time for the rock pit similar to developed campgrounds (usually 10 pm – 6 am).

## Mitigation Measures Common to All Action Alternatives

The following mitigation measures are an integral part of each of the action alternatives. These are different from Project Design Features in that they are typically tied to a specific route, trail, or location and they are used to avoid, minimize, rectify, reduce, or compensate an impact (40 CFR 1508.20). They are listed here separately to avoid repeating them in each alternative description.

The effectiveness of each measure is rated at high, moderate, or low to provide a qualitative assessment of how effective the practice would be in preventing or reducing resource impacts. These mitigation measures and design elements are considered in the effects discussions of Chapter 3.
Effectiveness ratings of High, Moderate, or Low are based on the following criteria: a) Literature and Research, b) Administrative Studies (local or within similar ecosystem), c) Experience (judgment of qualified personnel by education and/or experience, d) Fact (obvious by reasoned, logical, response).

***High**:* Practice is highly effective (greater than 90 percent), meets one or more of the rating criteria, and documentation is available.

***Moderate**:* Documentation shows that practice is 75 to 90 percent effective; or logic indicates that practice is highly effective, but there is no documentation. Implementation and effectiveness of this practice needs to be monitored and the practice would be modified if necessary to achieve the mitigation objective.

***Low**:* Effectiveness is unknown or unverified, and there is little or no documentation; or applied logic is uncertain and practice is estimated to be less than 60 percent effective. This practice is speculative and needs both effectiveness and validation monitoring.

***Wildlife Habitat***
To offset a potential decrease in wildlife use of the Little Walker Mountain guzzler due to an expected increase in motorized use nearby, a new guzzler would be installed on Walker Mountain. The new guzzler would be installed near the end of National Forest System Road 9755195. The Little Walker Mountain guzzler would remain in place and continue to be maintained. *High*

***Exclusive to Alternatives C and E:***
Due to the sensitive nature of unique wildlife habitats within it, Black Rock lava flow would be prioritized for education, monitoring, and enforcement to ensure riders stay within the confines of the trail tread. *Moderate*

***Soils and Water Quality***
During trail layout and prior to trail construction, where trail designation overlaps a former timber sale unit that has been completed within the last 20 years, it would be monitored for meeting soil quality Standards and Guidelines. If the unit is found to be below 80 percent in a productive state, avoidance or restoration activities would be utilized. In the area of overlap area, the objective is for the combination of the trail and the unit to be consistent with Regional policies and Forest wide Standards and Guidelines for soil quality. *High*

All fuel-powered vehicles and tools would be refueled at least 75 feet from any live stream. *High*

***Botanical Resources***
To assure protect a sensitive plant species near the Bonneville Power Administration powerline designated route, annual monitoring and structures such as split rail fencing would be used to define their habitat prior to implementation of the trail segment (TE-4). *High*

***Exclusive to Alternatives C and E:***
During trail layout and prior to trail construction at Black Rock lava flow, known sites of *B. tortuosa* would be flagged for avoidance. A botanist would work with the trail surveyor to designate the trail route to avoid removal of host vegetation where *B. tortuosa* is present. *High*

To protect sensitive plant species *B. tortuosa* near the Black Rock lava designated trail, structures such as split rail fencing would be used to define their habitat. *High*

***Cultural***
Incorporate data recovery (*High)*, protection (*Moderate)*, and/or avoidance (*High)* in eligible and unevaluated cultural resource sites.

Where site recovery information is required, it would consist of a detailed site record, sketches of the site and any artifacts or features present, gathering GPS data for updates to the spatial record, and entering field data into the corporate tabular database. These data are then forwarded to State Historic Preservation Office (SHPO) to complete the consultation process. *High*

To avoid ripping through the road beds that cross eligible or unevaluated sites as a means of making the trails narrower, use methods to narrow routes that do not involve ground disturbance. These include placement of barriers consisting of downed woody material perpendicular to the designated route, limiting the amount of limbing of overhanging branches, or defining the width of a trail using fallen trees. *Moderate*

Unless limited by topography, place trail drainage features outside of site boundaries to prevent unnecessary site damage. *High*

Definition of parking and staging areas within known eligible or unevaluated sites would be closely coordinated with the District Archeologist to limit potential loss of site artifacts and features. *High*

All rehabilitation ground disturbing activities would occur where there would be no effect to eligible historic properties. Other rehabilitation activities would use appropriate non-ground disturbing methods such as above ground barriers and shallow rooting of vegetation. *Moderate*

## Monitoring

The following is a summary of the planned and ongoing monitoring within the Three Trails OHV project area. The Forest Service believes a well-designed and monitored trail system can provide a positive riding experience for a segment of the public that desires and needs a designated trail system while maintaining various other uses of the National Forest lands.

Day to day monitoring of the system would incorporate a method similar to the Central Oregon Off-Highway Vehicle Operations (COHVOPS) model which has been successful in central Oregon. It incorporates agency personnel and volunteers into an integrated education and enforcement program that monitors elements such as sound testing at staging areas and key locations, and rules related to camping and use of the trail system. For more information, reference the Education, Enforcement, Safety, and Operational Maintenance Plan section in Chapter 3.

The following is specific monitoring identified by resource area:

***Soil and Water Quality***

During trail layout and prior to trail construction, where trail designation overlaps a former timber sale unit that has been completed within the last 20 years, it would be monitored for meeting soil quality Standards and Guidelines. If the unit is found to be below 80 percent in a productive state, avoidance or restoration activities would be utilized. In the area of overlap area, the objective is for the combination of the trail and the unit to be consistent with Regional policies and Forest wide Standards and Guidelines for soil quality.

An ongoing water temperature and monitoring program has been established and regular monitoring of stream temperatures in the Upper and Little Deschutes Sub-basin has occurred over the past decade.

***Botanical Resources***

Fencing and annual monitoring of a sensitive plant species would occur along the 012 road to assure protection of a sensitive plant population along a designated route under the Bonneville Power Line. An

element of the monitoring includes fugitive dust and its potential to affect plant health with an adaptive management element to change the surface of the road.

Project Design Features to be incorporated would include fencing and monitoring along the roadside adjacent to fens in the Junction segment.

***Invasive Plant Species***
The entire trail system, including staging areas would receive regular monitoring and prevention for invasive plant species presence. If found, an adaptive strategy of manual pulling of weeds has been incorporated.

***Wildlife***
Although no trail systems have been designed to overlap existing known bald eagle nest sites, ongoing monitoring of selected bald eagle nest sites would continue to occur within the project area as part of a forest monitoring program.

Ongoing monitoring and enforcement of big game hunting regulations occurs with partnership of Oregon Department of Wildlife, Oregon State Police, and the US Forest Service. The focus is during hunting season and emphasizes patrols within the green dot closure area at Walker Mountain.

***Cultural Resources and Site Monitoring Plan***
Monitoring of all sites would occur during and after trail construction and route designation for a period of 10 years. Following implementation, site visits would occur at least twice per open season. Additional visits may be warranted based on initial findings. The first annual visit would be within one month of the beginning of the "riding season" and the second within a month of the end of the season. This would provide comparative data over the course of the season to gauge changes at the monitoring locations. The Deschutes NF monitoring form would be used along with photographs where needed. All work must be conducted by a professional archaeologist.

***Road Management and Public Safety***
The District Road Manager would be responsible for monitoring the condition of lower standard native surface roads, addressing items that may need corrective action associated with timing of maintenance and public safety. Visibility related to adequate sight distance on curves and at intersections and adequate signing would be the focus.

## 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 that were 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 the alternatives may have duplicated the alternatives considered in detail or were determined to be unable to meet the project's Purpose and Need. Alternatives that were considered but dismissed from consideration and the reasons for dismissal are summarized below.

**Avoid Management Activities in Matsutake Habitat**
This alternative was considered because some commenters have requested that the Forest Service avoid matsutake habitat altogether. At a public meeting with the Alliance of Forest Workers and Harvesters (AFWH) they emphasized that this is their livelihood and please keep OHVs out. Due to the extensive range of known matsutake mushroom territory it is not feasible to exclude OHVs from such a large area. Therefore, this alternative was excluded from detailed consideration. The Interdisciplinary Team considered where the AFWH identified prime picking territory and excluded trails from areas of concern as much as possible as well as near the industrial mushroom camp. The area west of the 5834 road

between Crescent Lake and Two Rivers North subdivision was also identified by the harvesters and designated trails were excluded in this area.

**Connecting Roads via Trails along Walker Rim for Jeeps and Other 4-Wheel Drive Users**
An alternative was considered because some commenters requested the Walker Rim area be opened for jeeps and other 4-wheel drive vehicles as it is one of the few places on the District with terrain that offers this type of recreational experience. This was considered but eliminated from detailed consideration due to the fragile nature of the soil along the rim, the steepness of the terrain, the scenic visual component from Highway 97, and because it is a main migration route as well as fawning/calving area for mule deer. The action alternatives offer a trail system designed especially for this class of user in the Walker Mountain area, and the trail miles range from 10-22 depending on the alternative.

**More Opportunities for Jeeps and other 4-Wheel Drive Users**
Similar to the proceeding alternative, an alternative was considered because users wanted 150 miles of trails for weekend outings that include steep, rutted, rocky, skidder roads, fire roads, log crossings, and old mining sites to play in. Since we do not have that type of terrain available in sufficient quantities on the Crescent Ranger District, this alternative was considered but eliminated from detailed consideration.

**Connecting the Routes onto Adjacent National Forests**
An alternative design was considered because commenters requested to either build trails or allow use on the user-created connecting routes onto adjacent National Forest lands (Fremont-Winema, Umpqua, Willamette) so they could extend their rides and increase saddle time. Since each National Forest must decide under the 2005 Travel Management Rule whether to allow OHV use, based on current usage and need, terrain and/or opportunity, and then follow the NEPA process to designate a trail system, it is not possible at this time to connect to other National Forests. The Travel Management Rule allows for flexibility and further consideration of connections to adjacent National Forests in the future.

**Connecting to other Designated OHV Trail Systems**
An alternative was considered because riders asked about connecting to other designated trail systems such as East Fort Rock trail system, Santiam Pass OHV, and Huckleberry Flats OHV areas. This alternative was considered but eliminated because the Three Trails OHV project was based upon an area where it was determined the public had limited support for a designated trail system. To connect to adjacent designated trail systems would greatly expand the scope of the analysis outside the area of agreement and because it would entail traversing wilderness areas, private land, and the Newberry National Monument.

**Moving the Metolius-Windigo Horse Trail into the Wilderness**
This was an alternative considered because there is an approximately two mile stretch of the Metolius-Windigo horse trail from Road 60 to the Highway 58 snowmobile underpass that is the only safe undercrossing to access some Crescent Lake Junction businesses. It is currently shared by both non-motorized and unauthorized motorized users in summer, snowmobiles in winter, and the Three Trails OHV action alternatives currently propose to incorporate it into the Junction trail system. This is an area where alternative routes are limited due to the Burlington-Northern railroad tracks adjacent to the Diamond Peak Wilderness, private land, and riparian conditions. In order to address safety concerns identified with the sharing of the trail, the Interdisciplinary Team considered routing the shared portion into the Wilderness to separate the uses. This alternative was considered but eliminated from detailed analysis because a solution was found that addressed the safety concerns using cooperation from user groups, education, signing, and limited separation of the tread of the trail to maintain water quality. The reroute into the Wilderness would have entailed either a new stretch of trail, or use of a considerable length of existing trail, which would potentially be inconsistent with the Deschutes Forest Plan and maintaining wilderness values: M6-56 – that states “Trail systems would not normally be expanded into

currently untrailed areas that are providing opportunities for solitude and primitive recreation." Further, it would not be consistent with the goals of the Metolius-Windigo trail, which is primarily to serve long-distance horse riders seeking an alternative to the Pacific Crest Trail at a lower elevation that is snow-free for a longer period of time.

**Utilization of Junction Sno-Park as an Overnight Staging Area**
Junction Sno-Park was selected as a staging area because of its proximity to a very popular OHV destination, developed camping opportunities around the lakes, and its linkage to Crescent Lake Junction businesses. The proximity of the Sno-Park to the Metolius-Windigo equestrian trail was ideal because it would continue the shared use that was already occurring. An alternative was considered that would use the Sno-Park as an overnight staging area. This was eliminated from detailed consideration because of lack of facilities to support summertime overnight operations and the availability of overnight camping opportunities nearby, including private facilities at Crescent Lake Junction.

**Put corduroy in the Hwy 58 underpass near Crescent Lake Junction**
An alternative was considered because equestrian groups suggested putting corduroy (wooden logs) in the ground through the underpass to slow down other motorized and non-motorized (mountain bikes) users. The underpass was originally constructed using funds from the Federal Highway Administration and the Forest Service with the primary function to provide a safety connection for over-the-snow users. The clearance was set to allow a snow grooming machine to fit under the overpass in the winter to provide trails for the snowmobiles. This Project Design Feature was considered but eliminated because additional tread within the underpass would not allow the grooming machine to fit under the overpass, and it would be an obstacle for many motorized and non-motorized users.

**Use all user-created trails and build no new trails**
This was an alternative considered but eliminated because most user-created trail systems are randomly created, usually where it was either easiest to ride or the most challenging. This has caused trails to develop in inappropriate areas for resources such as cultural, aquatic, wildlife, and soil quality. They also may lack the engineering of a comprehensive trail system that provides safety, efficiency, and a riding experience that is suitable for a wider range of riders with different skill sets. Therefore, this alternative was eliminated from detailed consideration.

**Provide Engineered Trail Systems with No Roads**
This was an alternative considered but eliminated from detailed consideration because of the land base necessary to provide a sufficient trail system that would provide a range of riding experiences such as longer rides, challenge, access to water, scenery, and linkage to community services. Because of the linkage provided by existing high clearance roads (Maintenance Level 2), the Forest Service can offer a trail system that potentially can offer a diverse rider experience and linkage to the staging areas or local businesses at Crescent Lake Junction while maintain National Forest Lands for multiple uses. In addition, the Three Trails OHV project was identified by a working group of stakeholders as one of the areas in central Oregon where there is limited public support for designating a motorized trail system. Included was a recommendation to use existing roads in the design of the trail system. Therefore, this alternative was eliminated from detailed consideration.

**Make the Trail System from Shared-use Roads and No Engineered Trails**
This was an alternative considered because some members of the public believe motorized use of National Forest Lands should be restricted to the dedicated transportation system and additional use of user-created or new trail construction is inappropriate. This alternative was eliminated from detailed consideration because it does not meet the purpose and need to provide a designated trail system where there is some community support on the Crescent Ranger District in a suitable and sustainable location while considering other forest uses. The Forest Service believes a well-designed and monitored trail

system using both existing shared use and engineered trails can provide a positive riding experience for a segment of the public that desires and needs a designated trail system while maintaining various other uses of the National Forest lands.

**Prohibit cross-country travel without a designated trail system**
An alternative was considered that would prohibit cross-country travel without a designated trail system. This was eliminated from detailed consideration because it does not meet the Purpose and Need for providing a well-engineered and interconnected trail system for non-highway vehicles.

**More pit play areas**
This alternative was considered because many riders asked for more pit play areas. To respond, the Interdisciplinary Team reviewed all the potentially available play areas within or adjacent to the project area, including mineral sites. Many of the sites were not large enough (less than one acre) to provide a safe and quality riding experience, lacked the terrain, and have limited access. Those areas that were available were included in an alternative and all others were eliminated from detailed consideration.

## Comparison of Alternatives

The following Tables 3-7, in conjunction with the attached maps, provide additional information for a comparison between alternatives and how they respond to **Key Issue #1** to provide the recreational experience riders want. These tables display miles of routes by type (roads versus trails), design related to rider preference (long versus concentrated loops), miles by class of vehicle and seasonal closures, and potential diversity of the ride (number of play areas and scenic viewpoints). For more discussion and comparison on how the alternatives respond to this issue, and **Key Issue #3 (**noise as an annoyance) and **Key Issue #4** (incompatible uses of the Metolius-Windigo horse trail)**,** reference the Recreation section in Chapter 3. **Key Issue #2** and the comparison for alternatives in how they respond to big game is found in the Wildlife section, Chapter 3.

**Table 3. Comparison of OHV Opportunities between Alternatives**

| Alternative | Miles of OHV trails | Miles of roads converted to trails | Total Trail Miles in Final Trail System | Miles of Shared-use roads* | Miles of Level 2 roads available for OHV use | Type Riding System | Open Play Areas | Staging Areas | Access to Existing Developed Camp Ground Areas |
|---|---|---|---|---|---|---|---|---|---|
| **B** | 123 | 20 | 143 | 20 | 321 | Satellite | Muttonchop Pit | 4 | 0 |
| **C** | 100 | 53 | 153 | 118 | 283 | Long, open loops | Muttonchop Pit & Black Rock Pit | 6 | 3 |
| **D** | 108 | 43 | 151 | 56 | 284 | Concentrated loops | Quarry 2011 | 4 | 1 |
| **E** | 98 | 44 | 142 | 80 | 284 | Open and Concentrated loops | Muttonchop Pit & Black Rock Pit | 4 | 1 |

* Roads on which both highway legal and non-highway legal vehicles are operating as part of the designated trail system

**Table 4. Total Miles of Trails by OHV Class and Alternative**

| Alternative | OHV Class | | | Total Miles |
|---|---|---|---|---|
| | II | III | I, III | |
| Alt B | 15 | 0 | 128 | 143 |
| Alt C | 34 | 11 | 108 | 153 |
| Alt D | 10 | 11 | 129 | 151 |
| Alt E | 26 | 18 | 99 | 142 |

**Table 5. Comparison of Road Closures by Alternative, Trail Rehabilitation, and Seasonal Closures**

| Alternative | Miles of user-created trails to be closed and rehabilitated[16] | Closures | Miles of Closed Roads*** |
|---|---|---|---|
| **B** | 56 | Green Dot* | 41 |
| **C** | 90 | Green Dot & Seasonal** | 108 |
| **D** | 95 | Green Dot | 114 |
| **E** | 94 | Green Dot | 115 |

* Green Dot closures on Walker Rim for 2 weeks fall hunting season-(usually late-Sept thru mid-Oct.)
** Spring seasonal closure on Walker Rim for fawning/calving season May 01-June 15
*** Does not include roads converted to trails.

**Table 6. Play Pit Areas, Campgrounds, and Staging Areas by Alternative**

| Play Areas | Alt A | Alt B | Alt C | Alt D | Alt E |
|---|---|---|---|---|---|
| Black Rock Pit | | | X | | X |
| Muttonchop Pit | X | X | X | | X |
| Quarry 2011 | | | | X | |
| **Developed Campgrounds[17]** | | | | | |
| Crescent Creek Campground | | | X | | |
| Simax Group Campground | | | X | X | X |
| Boundary Springs | X | | X | | |
| **Staging Areas** | | | | | |
| Junction Sno-Park | X | X | X | X | X |
| Rivers (North) | | | X | X | X |
| Rivers (Midway) | | X | X | | |
| Rivers (South) | | X | X | X | X |
| Walker (Midway) | | X | X | | |
| Walker (South) | | | X | X | X |

[16] These are existing mapped user-created trails, any new user-created trails discovered during layout and construction of new trail system would be closed and rehabilitated.
[17] These are existing developed campgrounds that would have direct access by OHVs.

**Table 7. Scenic Viewpoints by Alternative**

| Location | Alt A | Alt B | Alt C | Alt D | Alt E |
|---|---|---|---|---|---|
| Walker 200RD | X | X | X | X | X |
| Walker 100RD | X | | X | | |
| Railroad Ridge | X | | X | X | X |
| Muttonchop Butte | X | X | X | | X |
| Little Odell Butte | X | | X | X | X |
| Royce Mt 2 | X | | X | | X |
| Black Rock Pit | X | | X | | X |
| Royce Mt 1 | X | | X | | X |
| Royce Mt 3 | X | | X | | X |

**Table 8. Bridge over Little Deschutes, Forest Plan Amendments, Wildlife Guzzler, Highway 97 Underpass, and Railroad Crossing by Alternative**

| Alternative | ATV Bridge over Little Deschutes | Day Use Parking (w/trail to Little Deschutes) | FPA* | Guzzler for Wildlife | Hwy 97 Underpass (south of Hwy 97 & 58 junction) | Railroad Crossing (south of 5825 rd) |
|---|---|---|---|---|---|---|
| **A** | | | | | | |
| **B** | | | IR, OG, KE | X | X | X |
| **C** | X | X | IR, OG, KE, | X | X | X |
| **D** | | X | IR, OG, KE, | X | X | X |
| **E** | | X | IR, OG, KE, | X | X | X |

* FPA- Forest Plan Amendment; IR- Intensive Recreation, OG- Old Growth, KE- Key Elk,

**Table 9. Miles of Trail in Northwest Forest Plan by Alternative**

| Alternative | Miles of Trails by Land Allocation in NWFP | | |
|---|---|---|---|
| | AWD* | LSR | Matrix |
| **A** | 3.6 | 0.8 | 0.5 |
| **B** | 7.2 | 0.8 | 3.8 |
| **C** | 7.2 | 0.8 | 3.8 |
| **D** | 7.2 | 0.8 | 3.8 |
| **E** | 7.2 | 0.8 | 9.7 |

* AWD-Administrative Withdrawn, LSR-Late Successional Reserve, Matrix-general forest type

**Table 10. Miles of Trail by Land Allocation in Deschutes Land and Resource Management Plan**

| Alternative | Miles of Trails by Land Allocation in LRMP | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | M8- GF | M11- IR | M15-OG | M17- WSR | M30-Other | M9-SV** | | |
| | | | | | | SV-PRF | SV-PRM | SV-RF |
| **A** | 81.1 | 4.3 | 7.5 | 2.7 | 5.7 | 10.8 | 0.9 | 0 |
| **B** | 10.2 | 1.1 | 0 | | 0 | 0.9 | 0.9 | 0 |
| **C** | 70.7 | 8.2 | 3.4 | 0.9 | 0.1 | 14.9 | 1.5 | 0.1 |
| **D** | 87.4 | 8 | 0.1 | | 0 | 11.3 | 0.9 | 0 |
| **E** | 67.6 | 8 | 1.8 | | 0.1 | 11.9 | 0.9 | 0.3 |

***** IR- Intensive Recreation, OG- Old Growth, GF- General Forest, WSR- Wild and Scenic
** SV- Scenic Views, PRF- Partial Foreground Retention, PRM- Partial Retention Middleground, and RF- Retention Foreground

**Associated Actions by Alternatives:**

In order for Alternative B to be implemented, the following are associated actions:

- About five miles of currently closed Maintenance Level 1 roads would be opened and used for OHV routes for all classes of vehicles.
- About 41 miles of currently open Maintenance Level 2 roads would be closed (changed to Maintenance Level 1) to offset effects of the designated trail system. All Maintenance Level 1 roads would remain open for administrative access.
- About 12 miles of Maintenance Level 1 and 2 roads would be converted to trail for Classes I and III vehicles and eight miles for Class II vehicles.
- About 56 miles of user-created trails that are either located in inappropriate areas and/or are redundant would be closed and rehabilitated.
- About 56 miles of shared use roads for all classes of vehicles.
- An underpass for Highway 97 that links the Rivers and Walker segments.
- A new wildlife guzzler installed on Walker Mountain.
- Railroad crossing south of 5825 road.

In order for Alternative C to be implemented, the following are associated actions:

- About five miles of currently closed Maintenance Level 1 roads would be opened and used for the OHV routes for all classes of vehicles.
- About 108 miles of currently open Maintenance Level 2 roads would be closed (changed to Maintenance Level 1) to offset the effects of a designated motorized trail system. All Maintenance Level 1 roads would remain open for administrative access.
- About 53 miles of Maintenance Level 1 and 2 roads would be converted to trail.
- About 90 miles of user-created trails that are either located in inappropriate areas and/or are redundant would be closed and rehabilitated.
- About 118 miles of shared use roads for all vehicle classes.
- Motorized and non-motorized uses would be separated as much as possible, except in wet areas (riparian reserves/RHCA) of the two-mile stretch of the Metolius-Windigo trail, by paralleling wherever possible. Equestrians, hikers, mountain bikers, and motorized users would continue to share portions of the trail due to limited options caused by terrain, land ownership, and proper riparian function of the wet areas. Signing would be used to encourage respectful behavior by all users.
- An underpass for Highway 97 that links the Rivers and Walker segments.
- A new wildlife guzzler installed on Walker Mountain.
- A day use parking area with non-motorized trail to the Little Deschutes River.
- Railroad crossing south of 5825 road.
- A new ATV bridge that crosses the Little Deschutes River.

In order for Alternative D to be implemented, the following are associated actions:

- About three miles of currently closed Maintenance Level 1 roads would be opened and used for the OHV routes.
- About 114 miles of currently open Maintenance Level 2 roads would be closed (changed to Maintenance Level 1) to off-set creation of engineered trail. All Maintenance Level 1 roads would remain open for administrative access.
- About nine miles of currently open Maintenance Level 2 roads would be converted to trail.
- About 95 miles of user-created trails that are located in inappropriate areas, are redundant, or otherwise unneeded, would be closed and rehabilitated.
- About 56 miles of shared use roads for all classes of vehicles.
- Motorized and non-motorized uses would be separated as much as possible except in wet areas (riparian reserves/RHCA) of the two-mile stretch of the Metolius-Windigo trail, by paralleling wherever possible. Equestrians, hikers, mountain bikers, and motorized users would continue to share portions of the trail due to limited options caused by terrain, land ownership, and proper riparian function of the wet areas. Signing would be used to encourage respectful behavior by all users.
- An underpass for Highway 97 that links the Rivers and Walker segments.
- A new wildlife guzzler installed on Walker Mountain.
- A day use parking area with non-motorized trail to the Little Deschutes River.
- Railroad crossing south of 5825 road.

In order for Alternative E to be implemented, the following are associated actions:

- About five miles of currently closed Maintenance Level 1 roads would be opened and used for OHV routes.
- About 115 miles of currently open Maintenance Level 2 roads would be closed (changed to Maintenance Level 1) to offset ceffects of designation of motorized trails. All Maintenance Level 1 roads would remain open for administrative access.
- About 43 miles of currently open Maintenance Level 2 roads would be converted to trails; 32 miles for Class I and III vehicles and 11 miles for Class II vehicles.
- About 94 miles of user-created trails that are located in inappropriate areas and/or are redundant would be closed and rehabilitated.
- About 80 miles of shared use roads for all classes of vehicles.
- Motorized and non-motorized uses would be separated as much as possible except in wet areas (riparian reserves/RHCA) of the two-mile stretch of the Metolius-Windigo trail, by paralleling wherever possible. Equestrians, hikers, mountain bikers, and motorized users would continue to share portions of the trail due to limited options caused by terrain, land ownership, and proper riparian function of the wet areas. Signing would be used to encourage respectful behavior by all users.
- An underpass for Highway 97 that links the Rivers and Walker segments.
- A new wildlife guzzler installed on Walker Mountain.
- A day use parking area with non-motorized trail to the Little Deschutes River.
- Railroad crossing south of 5825 road.

# Chapter 3. Affected Environment and Environmental Consequences

## Introduction

This chapter summarizes the physical, biological, social, and economic environments of the analysis area and the anticipated effects of implementing each alternative on that environment. The following effects analysis for each resource area assumes the Travel Management Rule as implemented by the Deschutes and Ochoco National Forests and Crooked River National Grassland DEIS (Travel Management DEIS) is not in place and it would likely be implemented in 2011. Therefore, the current existing condition described is for virtually unregulated cross-country travel in most management areas.

"Affected Environment" refers to the existing biological, physical, and social conditions of an area that are subject to change directly, indirectly, or cumulatively as a result of a proposed human action. Information on the affected environment is found in each resource section under "Existing Condition."

The following discussion of effects follows CEQ guidance for scope (40 CFR 1508.25(c)) by categorizing them as direct, indirect, and cumulative. The focus is on cause and consequences. Effects exist in a chain of consequences and thus may be labeled "indirect" (occurring later in time or farther in distance, 40 CFR 1508.8(b)), rather than cumulative. For this analysis, in general, direct and indirect effects have been discussed in the context that most readers are accustomed to: those consequences which are caused by the action and either occur at the same time and place, or are later in time or farther removed in distance but are still reasonably foreseeable (40 CFR 1508.8). Cumulative effects are discussed where there is an effect to the environment which results from the incremental effect of the action when added to other past, present, or reasonably foreseeable future actions (40 CFR 1508.7).

There are basically two methodologies the individual resource subjects use in discussing cumulative actions and consequences. The first method would be to describe each individual past, present, and reasonably foreseeable action – including mitigation (cataloging). The second would be to "lump" individual actions if the information regarding those actions would not be useful to illuminate or predict the effects of the proposed action and its alternatives. A mere "cataloging" of effects does not provide the most useful discussion. In some cases, lumping past actions and describing them in terms of "where we are today" can be the most informative. No matter which method is used, it would be formulated to provide the most relevant, useful, helpful, necessary, and informative format for the public and deciding official.

Measures to mitigate or reduce adverse effects caused by the implementation of any of the actions proposed are addressed in Chapter 2, Resource Protection Measures. Effective mitigation avoids, minimizes, rectifies, reduces, or compensates for potential effects of actions. After mitigation is applied, any unavoidable adverse effect to each resource area is addressed in the section titled "Other Disclosures" in this chapter of the EIS.

The temporal and spatial scale of the analysis is variable depending upon the resource concern being evaluated, particularly for cumulative effects. The landscape within the Three Trails OHV analysis area boundary is the focus of this EIS, but adjacent lands are considered in this analysis process.

## Changes between Draft and Final EIS

The following changes were made between the Three Trails OHV Project Draft and Final EIS. This list does not include minor grammatical corrections, editorial formatting, and clarification of data previously presented. The changes were driven by public comment and a comprehensive internal review.

- Big Marsh and Odell Tier 1 Watersheds consistencies
- A table and a summary of effects were added in the Old Growth section.
- A new figure was added to show more clearly the intersect between existing roads, user-created trails and the Wild and Scenic River corridors in the Three Trails OHV project area.
- Crescent Creek was added as a 303(d) stream within the project area.
- A response to EPA comments on a 'right sized' OHV system

## Cumulative Effects of Past, Present and Reasonably Foreseeable Future Actions

The Environmental Consequences disclosures in this EIS include discussion of cumulative effects. Where there is an overlapping zone of influence, or an additive effect, this information is disclosed. In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

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 would 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)"

The following Table 11 is merely a listing of past, present, and foreseeable actions that have potential to overlap the project area. Projects such as Seven Buttes and Seven Buttes Return harvest units do not have any influence or overlap of effects associated with the Three Trails OHV project; therefore they are not listed here. Because the project appears in this table does not necessarily mean it has an additive effect. Each resource specialist has reviewed this table and if there is a past, present, or foreseeable effect, it is disclosed in the individual resource area in Chapter Three.

**Table 11. Past, Present and Reasonable Foreseeable Future Actions**

| Project/Event Name | General Description of Activities | Status |
|---|---|---|
| Acquisition of Cascade Timberlands for Oregon State Forest (2010) | State of Oregon purchased 43,235 acres (Gilchrist Block) of working forest lands east of Highway 97 near the town of Gilchrist, OR from Cascade Timberlands (Fidelity National Timber Resources Inc.). This block borders the Boundary Springs area at Walker Mountain. | Completed |
| Baja EA (1998-2003) | 2, 878 acre understory thin (1,068 within suitable northern spotted owl habitat); 166 acres salvage in lodgepole pine; 904 acres prescribed burning in appropriate stands; and 250 acres of early seral stands in lodgepole pine. 610 acres of prescribed fire in lodgepole stands to create black-backed woodpecker habitat was not implemented to provide short-term matsutake production. | Completed |
| BLT (2008) | Commercial and small-tree thinning of forested stands, prescribed burning, piling and disposal of activity-generated slash, and construction of 9.8 miles of temporary roads over 7,499 acres within the analyzed vegetation management 80,000-acre BLT project area. | Implementation |
| Boundary Springs CE (2004) | 230 acres of hazardous fuels reduction in the Little Walker Mountain watershed along private land. Includes small diameter thinning, utilization, and disposal. | Completed |
| Cline Buttes Recreation Area Plan EA | Proposal to create a transportation system and recreation facilities on 32,000 acres of BLM lands approximately five miles west of Redmond. | Implementation |

| Project/Event Name | General Description of Activities | Status |
|---|---|---|
| Crescent Creek Resort | A destination resort planned near the eastern end of the Crescent Creek Wild and Scenic segment on private land. Currently in the land permitting phase with the State of Oregon, the applicant requests approval of a Master Development Plan for a 9,100-acre (+) Destination Resort with approx. 2,750 residence/lodging units and recreational amenities in a forestry zone. | Planning |
| Crescent Creek Wild and Scenic EA | Developing a management plan and identifying Wild and Scenic corridors. Standards and Guidelines from Deschutes LRMP (M17-4, p4-155). | Planning |
| Crescent Lake WUI (2004) | Commercial thinning and fuels reduction on 3,400 acres within the wildland-urban interface at Crescent Lake: 208 acres of non-commercial fuels reduction; 169 acres of meadow enhancement; and access improvement for residence egress. 162 acres was in suitable northern spotted owl habitat. | Implementation |
| Crown Pacific Land Exchange EIS (1998) | Exchange of National Forest lands on 31,256 acres for 34,319 acres of Crown Pacific lands to consolidate land ownership and enhance long-term resource conservation. | Completed |
| Danger Tree Removal (annual) | Removal of identified hazard trees along roads and in recreation areas and parking lots. Dependent upon the magnitude of disturbance events, an average year would fell 100 hazard trees or less district-wide per year. | Ongoing |
| Davis Fire (2003) | 21,000(+) acre fire from Davis Lake to Wickiup Reservoir thru the saddle between Davis Mt and Hamner Butte. 15,604 acres had high/moderate intensity that resulted in complete mortality of which 11,900 acres were mixed conifer and mostly located with Davis LSR. Replanting project ongoing. | Implementation |
| Davis Firewood CE (2010) | Utilizing dead and down material in greater Davis Fire area within 300 feet of the road for personal use firewood. Vehicles restricted to existing designated roads only. This area is outside the LSR and the Three Trails OHV project area. | Planning |
| Five Buttes EIS (2007) | 4,235 acres of commercial thinning retaining the largest trees; 4,235 acres of fuels treatments associated with commercial harvest units; 3,931 acres of additional fuels treatment in units where commercial thinning would not take place. | Partial Implementation near Davis Lake |
| Fremont-Winema Travel Management Plan (2009) | The proposed action would eliminate cross-country travel, allow motorized use on most of the current open roads, allow OHV use of all of the current miles of OHV trail (only 8.5 miles), and authorize an 80-acre play-area near Klamath Lake. | Planning |

| Project/Event Name | General Description of Activities | Status |
|---|---|---|
| Invasive Plant Treatments (2007) | Deschutes and Ochoco National Forests, Crooked River National Grasslands EIS to reduce the extent of specific invasive plant infestations at identified sites, and to protect areas not yet infested from future introduction and spread of invasive plants species from these sites. | Implementation |
| Lakeside WUI CE (2008) | Small tree thinning (to an upper diameter limit of 3 inches) and fuels treatment in the wildland-urban interface on 640 acres. Prescriptions maintain suitable habitat for northern spotted owls. | Implementation |
| Lava Rock OHV System EIS | Proposal to create an OHV trail system on 140,650 acres on the Bend Ft. Rock Ranger District with 154 miles of trails. Connections would be made to Rosland Play Pit (near LaPine) and East Fort Rock trail system. | Planning |
| Maintenance Burn CE (2005) | Prescribed fire on 1,933 acres in appropriate stands to maintain or restore fire in proper intervals. | Implementation |
| Meadow Lake Restoration and Travel Management Project EA (2010) | Sisters Ranger District is proposing a project on 9500 acres to focus on lakeside restoration of recreation-related impacts to riparian vegetation, fish and wildlife habitat, water quality, and the Santiam Wagon Road. It would include consideration to provide OHV opportunities in the planning area including Santiam Wagon road, limited links with Santiam OHV area on the Willamette National Forest and some Class II routes. | Planning |
| Ochoco Summit OHV Trail System EIS (2009) | Proposal to create an OHV trail system on 165,000 acres with 124 miles of trail and 45 miles of open NFS roads to connect trail system with 10 staging areas and 6 mapped trail heads east of Hwy 26 in the general vicinity of Big Prairie Summit. | Planning |
| (1997) Prescribed Underburning and Mowing Project CE | 2,553 acres of prescribed burning in appropriate areas and mastication of brushing (mowing) on the southern half of Crescent Ranger District, much of that overlaps BLT and Three Trails OHV areas. | Implementation |
| Region 6 Invasive Plant EIS (2005) | Implements Standards and Guidelines and prevention strategies to manage invasive plant species. | Implementation |
| Rim-Paunina EIS (2009) | 45,000 acre watershed on Walker Mountain at the southern end of Crescent Ranger District. Activities are to improve species habitat diversity that have been reduced by past management practices. 1) Fuels reduction activities on 8,553 acres with prescribed burning, mastication, limbing and small diameter tree thinning. 2) Commercial and non-commercial removal thinning on 14,620 acres. | Planning |

| Project/Event Name | General Description of Activities | Status |
|---|---|---|
| Rosedell CE (2005) | Commercial thinning and fuels activities on 166 acres within the wildland-urban interface around the town of Crescent and Odell Lake summer homes. Prescriptions maintain suitable habitat for northern spotted owls. | Implementation |
| Royce Butte Fire (2008) | 381 acre fire near Crescent Lake Junction (12 miles west of Crescent, OR) 90 percent of burned area was lodgepole pine. | Completed |
| Royce Butte Firewood CE (2010) | Utilizing dead and down material in greater Royce Butte Fire area within 300 feet of the road for personal use firewood. Vehicles restricted to existing designated roads only. | Implementation |
| Seven Buttes Return (2001) | Commercial understory thinning on 5,950 acres; small tree thinning on 230 acres for forest health, salvage of 560 acres primarily in lodgepole pine. No activities occurred in suitable northern spotted owl habitat. | Implementation |
| Small Diameter Tree Thinning CE (2009 and annually) | Thinning of small trees in plantations on 2,529 acres. Typically a range of 2,000 to 3,000 acres of trees are annually thinned in this manner. | Planning |
| Spruce Creek Restoration CE (2007) | 100 acres of wetland restoration along Spruce Creek and an un-named tributary of Spruce Creek. | Implementation |
| Swamp Creek Riparian Restoration CE (2010) | 330 acres of wet meadows restoration including small diameter tree thinning, planting, and fencing wetland shrubs along Swamp Creek, Hemlock Creek, and Spruce Creek. Located in Hemlock Creek subwatershed of Upper Little Deschutes River Basin. | Planning |
| Implementation of the Deschutes and Ochoco National Forests and Crooked River National Grassland Travel Management Project EIS | Motorized travel in Central Oregon would be restricted to designated roads and trails only. Access to dispersed camping would have special provisions to limit access to sensitive areas. | Expected in 2011 |
| Umpqua National Forest Travel Management EA (2010) | The proposed action would eliminate cross-country travel, allow motorized use on most of the current open roads, and include approximately 721 miles of OHV trail open to Class I and III. Access to dispersed camping would have special provisions to limit access to sensitive areas. | Implementation |
| Willamette Travel Management Rule Implementation EA (2009) | Motorized travel on the Willamette National Forest would be restricted to designated roads and trails only. Access to dispersed camping would have special provisions to limit access in sensitive areas. | Implementation |

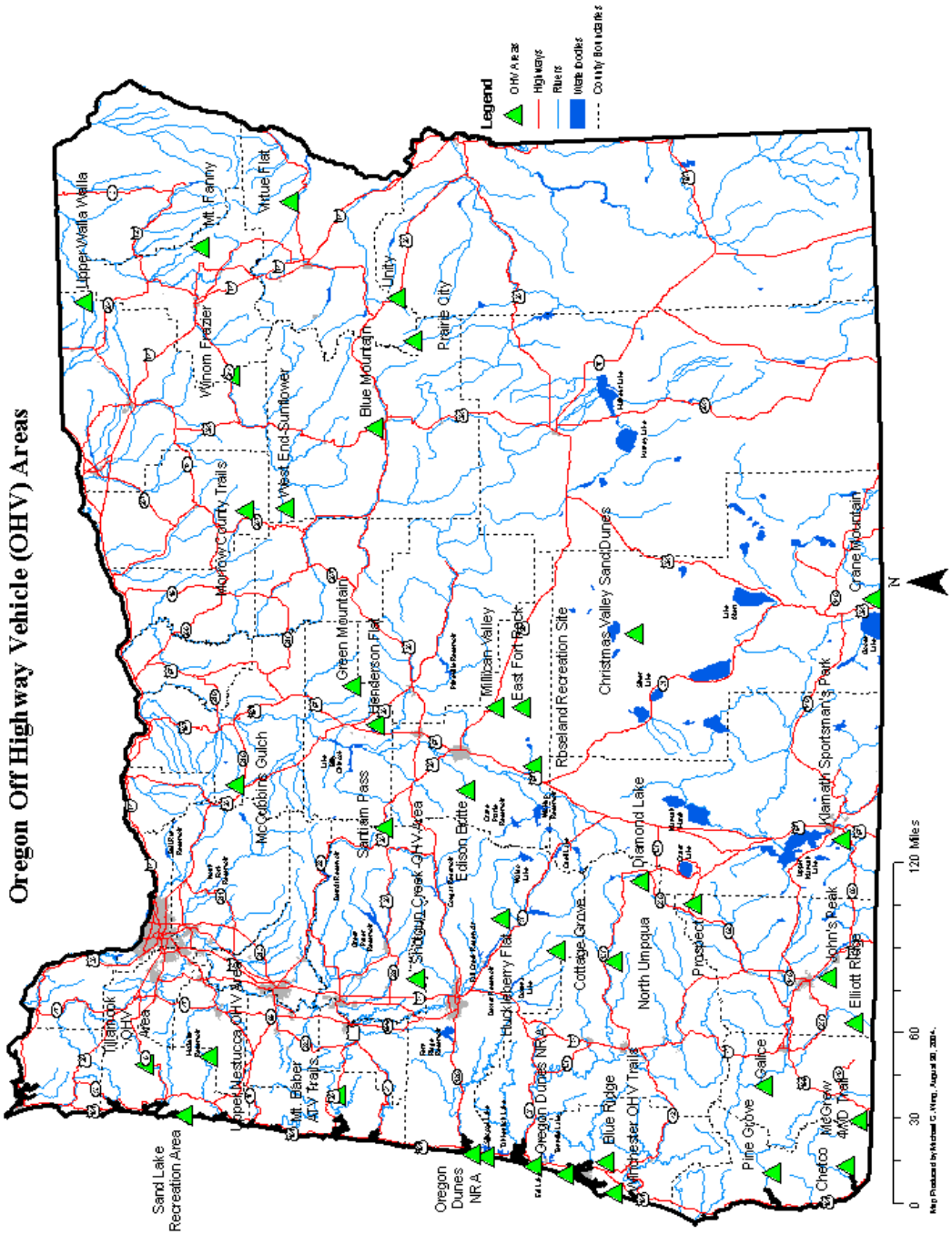


**Figure 11. Existing Designated OHV Areas in Oregon**

Cite: Bergerson. 2004 Inventory Report. Oregon Parks and Recreation Department

## Recreation

The following is a discussion from the recreation specialist report in its entirety. The zone of influence for the direct and indirect effects discussion is bounded by the adjacent Oregon Cascade Recreation Area, the Diamond Peak Wilderness and the Mt. Thielsen Wilderness area at the crest of the Cascade mountains to the west; and the Crescent Ranger District boundary (encompassing the project area) to the north, south, and east. The Deschutes National Forest and interlinking adjacent forest perspectives are discussed in their appropriate context and intensity under existing condition and cumulative effects. The organization of this section does not attempt to break out the resource by motorized versus non-motorized because 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.

***Background***

Off-highway vehicle (OHV) recreation is allowed on National Forest System lands in appropriate places and under proper management (Forest Service Manual 2355.03). At the end of World War II in 1945, the first commercially-made OHV was introduced: the four-wheel drive Jeep. In 1947, Soichiro Honda built his first motorized bicycle using a small motor from a war surplus generator engine (California State Parks 1996).

Advances in motor vehicle technology and availability have created new opportunities for OHV use. Vehicles that can traverse increasingly difficult terrain - including all-terrain vehicles (ATVs) and sport utility vehicles (SUVs) - are widely used and growing in popularity.

In its current state on the Deschutes National Forest, its Forest Plan permits all modes of travel in its Management Areas (including OHV use) except where specifically closed. As a result of increasing attention focused on managed use of OHVs on National Forest System lands as a result of former Forest Service Chief Dale Bosworth identification of unmanaged recreation as one of four key threats facing the National Forests, a national strategy was put in place.

The national strategy to manage OHVs is the application of a consistent motorized access policy throughout the National Forest system. By requiring uniform access rules, the Forest Service seeks to eliminate confusion and inconsistency as factors contributing to resource degradation. The Forest Service published final travel management regulations in the Federal Register [FR Vol. 70, No. 216-Nov. 9, 2005, pp 68264-68291]. The new regulations, commonly referred to as the Final Travel Management Rule (Rule), require each unit of the National Forest System to:

1. Designate roads, trails, and areas for motor vehicle use by class of vehicle and time of year, and
2. Publish a motor vehicle use map displaying the routes and areas. Upon publication of the map, a new *36 CFR 261 Subpart A* prohibition prohibits motor vehicles outside of the designated system.

A growing body of evidence shows that OHV use may have an affect on forestlands, wildlife, and on the experiences of non-motorized (quiet) users (Cordell et al. 2008a). Increasing attention is focused on uncontrolled use of OHVs on National Forest System lands and on the impacts from their use.
In order to manage OHV use on the national forests, the Forest Service published regulations commonly referred to as the Travel Management Rule that requires each unit of the National Forest System to:

The Rule provides a consistent framework for designating motor vehicle use routes and areas on national

forests and grasslands. The Rule states, in part, that the Forest Service "must strike an appropriate balance in managing all types of recreational activities. To this end, a designated system of roads, trails, and areas for motor vehicle use established with public involvement would enhance public enjoyment of National Forests while maintaining other important values and uses of NFS [National Forest Systems] lands" (Federal Register, page 68265).

The Deschutes and Ochoco National Forests and the Grasslands are proposing to implement the Travel Management Rule through an Environmental Impact Statement that should be available in early 2011. It will:

- Prohibit motorized travel 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.
- 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.

Because OHV riders would be limited from their current uses when the forests implements the Travel Management Rule the Forest Supervisors of the Deschutes and Ochoco National Forests decided to pursue designating additional OHV trail systems on the forests to offset the OHV opportunities that would be lost. The Three Trails OHV project is one of three additional OHV trail systems proposed on the Deschutes and Ochoco National Forest by a process that identified areas of limited public support for a designated OHV trail system. This process followed a series of public meetings by a diverse group of citizens representing a wide range of opinions on how OHVs should be used on National Forest lands. This group was chartered under the Federal Advisory Committee Act, or FACA.

Use of ATVs for recreation in Oregon is increasing. Since 1990, sales of quad (Class I) and off-road motorcycle (Class III) ATVs have increased more than 400 percent. There are more than 150,000 active ATV operating permits in Oregon (Oregon Parks and Recreation Department 2009). Cordell et al. (2008a) also 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. 2008a). OHV use today, however, is among the fastest growing outdoor activities. Although the economy over the recent years has likely affected the recent dip in OHV use and sales locally and nationally, it is believed the overall trend for increase in use would continue. Nationally, the number of people (16 years of age and older) who report participating in OHV sports is over 44 million. 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 percent between 1993 and 2003, from fewer than three million to more than eight million vehicles. ATVs (not counting full-size, 4-wheel drive vehicles) account for about 70 percent of all OHVs (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 et al. 2008a).

The State of Oregon has determined that additional motorized trail plans are needed in the area of the Crescent Ranger District. After two years of consultation and collaboration, the State of Oregon published The Oregon Trails 2005-2014: A Statewide Action Plan. For the South Central Trails Planning Region (Klamath and Lake Counties, that includes the Three Trails OHV planning area), the report lists the top regional motorized trails plan issue as a need for more designated motorized areas to accommodate OHV enthusiasts in the region. Contrary to this report, a 2005, State of Oregon study found a trend for closing existing riding opportunities within the region (Bergeson et al. 2005).

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 (USDA Forest Service 2009c). Table 12 shows that during their visit to the Deschutes National Forest, the top five recreation activities of visitors were viewing natural features, hiking/walking, relaxing, viewing wildlife, 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 viewing natural features, hiking or walking, downhill skiing/snowboarding, fishing, relaxing, and cross-country skiing and snowshoeing.

The NVUM survey is an effort that collects information on National Forests and Grasslands about visitor satisfaction and use every five years. It is a broadscale look and not necessarily good at site-specific information. It can be useful in displaying the percent of use of the National Forest by activity (Table 12). It displays the second round of NVUM surveys from 2008 (USDA Forest Service 2009c). NSRE data source is 1999-2007 survey information for the National Survey on Recreation and the Environment (Cordell et al. 2008b). NVUM data is a forest-wide perspective on visitation or "snapshot in time" for a particular year. It reflects the economy at the time and particular weather conditions during the sampling period. If there are external factors such as forests are in a mode of restricted entry due to wildfires, or it is raining during the sample period, then the monitoring reflects those conditions. It also was not particularly focused on ATV use. Responses from visitors are voluntary. It also is not comparable to previous NVUM data because of the changes over the years in the methods used for data collection. The Three Trails OHV Purpose and Need for the project was not based on NVUM data; it was based on public comment obtained through public meetings in selected communities and visible use that is occurring on the district in three particular areas. NSRE may not reflect local use (as NVUM data), but it does reflect national data from a larger and more frequent sample with greater confidence.

For example, the NVUM data shows of those that visited the Deschutes National Forest, 2.1 percent used an OHV for recreation sometime during their stay. Whereas on a national level, 19 percent of visitors use an OHV. In 2008, Deschutes National Forest visitors that hiked for the day (40.6 percent) more closely matched up with the national average (35.4 percent).

**Table 12. Deschutes National Forest Activity Participation and Primary Activity (NVUM) and National User Participation (NSRE) in Comparable Recreation Activities**

| Activity | % Deschutes Participating (NVUM) | % as Main Activity (NVUM) | % All Users Participation (NSRE) | % All OHV Users (NSRE) |
|---|---|---|---|---|
| Backpacking | 0.5 | 0.1 | 11.4 | 19.9 |
| Bicycling | 7.5 | 3.7 | 22.0 | 34.4 |
| Cross-country Skiing | 7.4 | 5.5 | 4.8 | 6.7 |
| Day Hiking | 40.6 | 16.1 | 35.4 | 47.9 |
| Developed Camping | 8.4 | 2.9 | 29.1 | 44.7 |
| Downhill Skiing | 17.4 | 15.9 | 9.2 | 14.8 |
| Driving for Pleasure | 14.4 | 1.9 | 59.1 | 86.3 |
| Family Gathering Outdoors | ** | ** | 76.2 | 84.9 |
| Fishing | 16.1 | 10.6 | 24.5+ | 44.6+ |
| Gathering Forest Products | 3.4 | 1.3 | 32.5 | 52.0 |
| Horseback Riding | 0.7 | 0.8 | 8.7 | 16.8 |
| Hunting | 2.0 | 1.9 | 10.0+ | 28.4+ |
| Motorized Water Activities | 4.2 | 1.8 | 28.5+ | 46.9+ |
| Nature Center Activities | 4.4 | 0.2 | 61.8 | 69.5 |
| Nature Study | 3.3 | 0.2 | no data | no data |
| Non-motorized Water | 6.8 | 3.4 | 11.2+ | 21.4+ |

| Activity | % Deschutes Participating (NVUM) | % as Main Activity (NVUM) | % All Users Participation (NSRE) | % All OHV Users (NSRE) |
|---|---|---|---|---|
| OHV Use | 2.1 | 1.3 | 19.0 | 100.0 |
| Other Motorized Activities | 0.3 | 0 | no data | no data |
| Other non-motorized | 5.6 | 1.5 | no data | no data |
| Picnicking | 10.3 | 2.2 | 58.9 | 65.2 |
| Primitive Camping | 1.3 | 0.2 | 17.8 | 37.2 |
| Relaxing | 33.8 | 5.5 | no data | no data |
| Resort Use | 3.6 | 0.4 | no data | no data |
| Snowmobiling | 3.4 | 2.3 | 4.3 | 16.4 |
| Sightseeing | * | * | 58.5 | 78.8 |
| Viewing Natural Features | 43.3 | 18.4 | 66.5 | 75.9 |
| Viewing Wildlife | 25.1 | 1.6 | 51.4 | 67.6 |
| Visiting Historic Sites | 3.4 | 0.5 | 51.5 | 59.3 |
| Walking for Pleasure | * | * | 86.2 | 88.9 |

- "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 2008 activity participation list.
- "**" In the 2008 activity participation list picnicking and family gathering were lumped together as one category.

Primary OHV users also participate in a variety of other recreation activities during their forest visit (USDA Forest Service 2006b). In Washington and Oregon, the most popular secondary activity for primary OHV users is developed camping (Table 13). Relaxing and viewing natural features also had high participation rates. From the preceding table, a relationship can be obtained using the last column to compare secondary activities for primary OHV users on a national level. For example, 44.7 percent of primary OHV users camp in developed sites, compared to 49.9 in Oregon and Washington.

**Table 13. Secondary Activities Reported by Primary OHV Users in the Pacific Northwest Region of the Forest Service[18]**

| Activity | % of Primary OHV Users |
|---|---|
| Developed Camping | 49.9 |
| Relaxing | 46.5 |
| Viewing Natural Features | 46.2 |
| Viewing Wildlife | 24.4 |
| Hiking/Walking | 20.4 |
| Driving for Pleasure | 16.7 |
| Gathering Forest Products | 9.5 |
| Primitive Camping | 6.0 |
| Fishing | 2.0 |
| Visiting Historic Sites | 0.0 |
| Hunting | 0.0 |

Oregon State Law allows OHVs to travel on one-lane gravel and native-surface roads (Oregon Parks and Recreation Department 2009). Over 5,000 miles of road are available for OHV use on the forest to all classes of vehicles and 800 miles of road on the Crescent Ranger District. Class I and III OHVs are also

[18] Data source is the first round of National Visitor Use Monitoring surveys (USDA Forest Service 2006b).

permitted on roughly 350 miles of designated trails, whereas Class II trails are currently limited in central Oregon to 21 miles at Edison Butte and 40 miles at Cline Buttes. There are none designated on the Crescent Ranger District. Although the extensive road system and motorized trails provide motorized access for many types of vehicles, roads and designated trails do not always provide the recreational experience that many people seek. 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.

Several public land management agencies manage more than 40 designated OHV sites and areas in Oregon (Figure 11). 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 central Oregon for OHV recreation probably also use these other areas either instead of or in addition to Forest routes. NVUM reported substitute choices made by OHV users if they were unable to use National Forest System lands. About 64 percent of primary OHV users in the Pacific Northwest responded that they would go somewhere else 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 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 (USDA Forest Service 2006).

The Fremont-Winema National Forests lie directly south and east of the Crescent Ranger District and some roads open to OHVs traverse the forest boundaries. As with all national forests, the Fremont-Winema National Forests also are implementing the Travel Management Rule.

In Oregon, ATV riding (three and four wheel vehicles) is by far the most popular type of OHV use, reported by 40 percent 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 (Table 14). 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.

In 2009, Robert C Burns et al. published a study titled **"2008 Central Oregon Off-Highway Vehicle Use Study: A Survey of Characteristics, Behaviors and Perceptions"**. The focus of this investigation was an evaluation of visitor perceptions of current conditions at OHV areas due to growing visitation and congestion at certain sites within the Deschutes–Ochoco NF. This report focused on highlights of basic findings from on-site interviews that were conducted over the 2007-2008 OHV recreation season. In conclusion, results suggest that visitors generally were very satisfied with their overall experience, felt that is was not crowded, the number of people they saw was about what they expected or less, and went there because it was a good place to do the activities they enjoy. This conclusion has limited application to the Three Trails OHV Project Area for a couple reasons. Responses would likely be different at Crescent Lake Junction or Two Rivers North, where there are no nearby designated trail systems. Also, the clientele interviewed for the study is likely a different subset of visitors than are found at the Crescent Ranger District, where public meetings in Eugene and Klamath Falls has indicated a strong visitation from those communities.

Off-road motorcycling is reported to be the favorite activity by 44 percent of OHV users (Table 14). Forty-four percent and 29 percent of OHV users favor four-wheel driving with stock vehicles and four-wheel driving with modified vehicles, respectively. Modified 4-wheel drive vehicles have modified tires and/or suspension upgrades.

**Table 14. Frequency of Motorized Trail Participation in Oregon among Households Reporting OHV Participation[19]**

| Activity | Participated in the 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 |

Residents from the counties that visit the Crescent Ranger District most often (Deschutes, Crook, Lane and Klamath) state that ATVs (Class I) are also the most popular OHV (Table 15). Class III OHVs (motorcycle) ownership ranges from 17 to 27 percent for these counties (Table 15). Lane County departs from ownership patterns for Class II OHVs (jeeps, side-by-sides, etc) by having 22 percent of permits for these vehicles, whereas the other counties show 11 percent (Lindberg 2009).

**Table 15. OHV Ownership, Permits, In-state, by County, Percent of County Ownership by Class (Lindberg 2009)**

| | Class I (ATV) | Class II (jeep, side-by-side, etc.) | Class III (motorcycles) | Total |
|---|---|---|---|---|
| Oregon Total | 61% | 18% | 21% | 100% |
| Crook | 72% | 11% | 17% | 100% |
| Deschutes | 61% | 11% | 27% | 100% |
| Klamath | 72% | 11% | 17% | 100% |
| Lane | 59% | 22% | 19% | 100% |

**Existing Condition**

There are roughly 900 miles of forest system trails on the Deschutes National Forest and about 153 miles on the Crescent Ranger District that are managed exclusively for non-motorized uses (excluding snowmobile, cross-country ski, and snowshoe trails). The 351 miles of forest trails on the Deschutes National Forest that are managed for OHV use are also open to non-motorized uses.

The Crescent Ranger District has a variety of recreation opportunities to offer. There are 130 lakes on the District. The larger lakes are Odell, Crescent, Summit, and Davis. There are also several streams that provide varied fishing opportunities. Other recreation opportunities include hiking, camping, hunting, scenic viewing, snowmobiling and cross-country skiing.

Within the Three Trails OHV Planning Area there are three developed campgrounds, one day use area, and access to three trailheads into the Diamond Peak and Mt. Thielsen Wildernesses (Table 16) and the Oregon Cascades Recreation Area that is largely unroaded. There are two Sno-parks at Crescent Lake and three Wild and Scenic Rivers (Table 17). Also, there are also 72 privately owned recreational residences along the northern shore of Crescent Lake.

***Developed Recreation***

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 snow parks;

[19] Data is from the 2004 Oregon Statewide Motorized Trail User Survey (Bergeson et al. 2005).

two visitor centers, and other minor sites. The developed site specifically for OHV use is China Hat Campground, and the designated trails systems are Edison Butte and East Fort Rock OHV areas and trailheads.

The Crescent Ranger District manages 19 campgrounds, day-use sites, and horse camps. A concessionaire manages the campgrounds and their revenue has gone up and down over the years, but sharply decreased in 2008 – possibly due to the high price of gasoline. Campground revenue on the other two districts of the Deschutes National Forest in 2008 were either up or only slightly below 2007 levels – possibly because they are closer to population centers and visitors stayed closer to home. Three private lodges also operate on the forest near Crescent and Odell Lakes. The owners estimate their total use to be 480 visitors per day with about five percent bringing OHVs (USDA Forest Service 2009a). Developed recreation sites located within, or immediately adjacent to the project boundary are the Junction Sno-Park, Crescent Creek Campground, Simax Beach Group Campsites at Crescent Lake and Boundary Springs Campground. There are approximately 10 more developed sites surrounding Odell and Crescent Lakes in the Junction segment that would be available for overnight camping.

***Dispersed Recreation***

Highly popular dispersed recreation activities on the Deschutes National Forest include camping, fishing, hunting, (non-commercial) gathering forest products such as antlers, mushrooms, cones, etc., and driving Forest roads for recreation, or viewing natural scenery. There are over 6,132 miles of road, of which 5,363 miles are open to both highway legal, and non-highway legal vehicles. In addition, there are 350 miles of trail open to motorized travel for OHVs and motorcycles including 25 miles open to 4-wheel drive vehicles on the Forest. Such an extensive network of roads and trails provides users with a variety of options to access and view the Forest.

Dispersed camping, hiking, viewing wildlife, and day use picnicking are popular activities on the Forest (Table 12). 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 the Forest offer extensive opportunities for dispersed car and trailer camping and picnicking. Many sites have existed for years, and the same families use them year after year. They access some of these sites from roads that have been administratively closed, but have not been physically closed on the ground and appear to be open.

On the Crescent Ranger District, which encompasses the Three Trails OHV planning area, there are 66 inventoried dispersed sites and most are accessible by high clearance roads. The main concentration of sites is on the Little Deschutes River near the Rivers segment and at the base of Walker Mountain in the Walker segment.

Big-game hunting is a popular activity in some parts of the Forest and especially in the Walker segment. The 2008 NVUM (Table 12) for the Deschutes National Forest showed that approximately two percent of forest visitors participated in hunting as either a secondary or a primary activity. Hunters use vehicles extensively to access campsites, scout for game, and retrieve game[20]. There are two schools of thought with many hunters. Some believe their hunting success rate and experience are improved in areas where use of motorized vehicles is limited. Others promote hunting with motorized vehicles.

***User conflicts***

User conflict happens when a person's expectations for his or her recreational experience are not met. This can occur as result of contact with another user or through disturbance from the sound or physical

[20] Game retrieval using motorized cross-country travel would no longer be authorized under the implementation of the Travel Management Rule.

evidence left by another user. Examples might include gunshots or horse manure on a trail. Some hunters that hike or ride into hunting areas on stock express that OHV users ruin their hunting opportunities when they drive into hunting areas that others have worked hard to walk or ride stock into. Some non-motorized use hunting proponents have raised questions of fair chase or unfair advantage when others use OHVs for hunting access. The potential for conflict exists among all user groups, and even among the same user group, when personal expectations of desired experience are not met. Not all user conflicts on the national forest are entirely recreation-based. In addition to recreation, the national forest system provides a wide array of resource-based opportunities, such as timber harvest, livestock grazing and mining. Some complain about cow manure on hiking trails or OHVs on closed roads and within closure areas.

Non-motorized users may use designated motor vehicle routes and would expect to encounter motor vehicle use, thus, not affecting the expectation and experience. In areas where the non-motorized user does not expect to encounter motor vehicles is where the user conflict occurs. It is within these areas and under these situations that user conflicts are often exacerbated due to noise, emissions associated with motor vehicle use, and lack of awareness of motor vehicle use in the area.

As the number of users and differing types of use continue to increase, there is the potential that user conflicts would also increase. However, motorized roads and trails would be administratively defined and published on a motor vehicle use map (MVUM). Recreationists would then be better able to plan recreational pursuits based on an individual's unique expectations and desires. As a result, the frequency of user conflicts between non-motorized and motorized recreation users would remain very low, or decrease, in both short and long terms.

***Special Uses***

All commercial events (where an entry fee is established) on National Forest lands must be authorized by a special-use permit. For the Forest Service to authorize OHV events, organizers must ensure the use is consistent with surrounding land uses.

***Wilderness***

Portions of two wilderness areas along the Cascade Mountain crest are within the Crescent Ranger District: Mt. Thielsen Wilderness, and Diamond Peak Wilderness. Table 16 shows the acres of each wilderness.

**Table 16. Land Area in the Two Wilderness Areas that are Partially on the Crescent Ranger District, Deschutes National Forest**

| Wilderness | Total Acres | Crescent Ranger District Acres |
|---|---|---|
| Mt. Thielsen | 61,281 | 6,400 |
| Diamond Peak | 54,185 | 32,964 |
| Total | 115,466 | 39,364 |

***Wild and Scenic Rivers***

Three rivers on the Crescent Ranger District and within the Three Trails OHV planning area are part of the National Wild and Scenic Rivers System: Big Marsh Creek, Crescent Creek, and Little Deschutes River, comprising 37 river miles. The 1968 Wild and Scenic Rivers Act calls for maintaining the free-flowing character of designated rivers, protecting the water quality, and protecting and enhancing their "outstandingly remarkable values." Outstandingly remarkable values (ORV's) are values or opportunities in a river corridor that are directly related to the river and that are rare, unique or exemplary from a regional or national perspective.

The three Wild and Scenic rivers on the Crescent Ranger District are classified as Recreational Rivers – meaning that these rivers are readily accessible by road and may have some development along their shorelines. The Deschutes Forest Plan standards and guidelines state that OHV access off of open roads within these three Wild and Scenic river corridors is restricted to designated routes only, although some OHV use is occurring within the corridors off of open roads. There are no designated OHV routes on the district.

**Table 17. Wild and Scenic Rivers within the Three Trails OHV Planning Area**

| River Name | Designated Miles | Classification | Outstandingly Remarkable Values |
|---|---|---|---|
| Big Marsh Creek | 15 | Recreational | Scenery/Vegetation, Geology, and Wildlife |
| Crescent Creek | 10 | Recreational | Scenery/Vegetation, and Wildlife |
| Little Deschutes River | 12 | Recreational | Scenery/Vegetation, Geology, and Wildlife |

The Oregon Cascades Recreation Area (OCRA) was created by Congress in 1984 to protect and enhance the recreational values of this area adjacent to the Diamond Peak Wilderness. The 157,000 acre area includes portions of the Willamette, Umpqua, and Deschutes National Forests. These national forests manage it to provide a wide range of recreational opportunities, including motorized use in some portions.

***Recreation Niche***

The recreation niche is a description, or characterization, of the distinct role each forest plays in providing outdoor recreation opportunities, experiences, and benefits. The niche is, in part, determined by public expectations (demand) and by the ecological capabilities of the land. The niche allows managers to focus management efforts on what is unique and valuable about the Forest. In 2005, the Deschutes National Forest developed a recreation niche statement and mapped where the public recreates. This "sense of place" map was translated into a narrative about the relative importance of the Forest for various recreation opportunities, experiences, and benefits. The wide variety of visitor preferences and uses were grouped into three spatial categories (settings): 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. There is good access to day use and overnight activities such as hiking, backpacking, climbing, and fishing.

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, rushing clear rivers cutting through the high desert terrain of majestic ponderosa pine, and central Oregon communities where quality of life depends greatly on the forest. Hub community economies are enhanced by nature based eco-tourism, community festivals, and events that attract local, national, and even international visitors. The mountains provide hiking, mountain biking, lake-side camping, and fishing in the summer. In the winter, skiing, snow shoeing, and snowmobiling are primary. The Deschutes River provides white-water rafting and both the Deschutes and Metolius rivers provide world-class fishing. All of these are within easy access of the Recreation Hub communities resulting in year-round high use.

Visitors are drawn to the forest because of the spectacular diverse settings that provide four seasons of recreation opportunities, from high mountain climbing to desert trail riding and from skiing to

snowmobiling. Recreation opportunities on the Deschutes National Forest are a local and regional resource. The diversity of Cascade mountain and high desert settings defined by terrain, scenic beauty, and types of access available offering outstanding recreation opportunities to users. The diverse types of recreation that occur include hunting, fishing, hiking, dispersed and developed camping, picnicking, horseback riding, mountain bike riding, OHV and motorcycle riding, jeep and 4-wheel drive vehicle touring, rafting, skiing, among many others.

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. In contrast to the other two settings, the High Desert provides a place "to get away." Generally, low-use predominates with easily accessible activities including rock hounding, hunting, and a well managed designated OHV area (USDA Forest Service 2006).

The recreation niche indicates that the High Desert niche setting is an incredible opportunity for well-managed designated OHV areas and that this setting is appropriate for OHV use and OHV trailheads. The Three Trails OHV planning area is within the High Desert niche setting.

***Central Oregon OHV Operations (COHVOPS)***

The Forest Service and the Bureau of Land Management (BLM) have combined forces to manage the central Oregon off highway vehicle trail systems through a program called Central Oregon Off-Highway Vehicle Operations (COHVOPS.)

The mission of COHVOPS is to provide consistent, quality off-highway vehicle recreation opportunities that are focused on customer service and resource protection. COHVOPS manages the central Oregon OHV trail systems for the Deschutes and Ochoco National Forests and the Prineville BLM. This includes operations, maintenance, monitoring, patrolling, user education, and law enforcement[21]. The team implements existing OHV management plans, identifies future needs, recommends actions to management, and assists in future OHV planning efforts. COHVOPS is funded through a combination of direct support from the Forest Service, the Bureau of Land Management (BLM), and grant funding from the State of Oregon derived from the ATV Allocation Funds derived from the ATV Permit program and a portion of gas tax revenue.

Many OHV areas and trails exist in central Oregon. Table 18 lists the areas closest to the Crescent Ranger District. (Figure 11 shows designated trail systems in Oregon).

**Table 18. Selected OHV Opportunities close to the Crescent Ranger District[22]**

| Name | Managing Agency | Location | ATV Classes | Season | Description |
|---|---|---|---|---|---|
| East Fort Rock | Deschutes National Forest | 21 miles east of Bend on US 20 | I and III, Class II on Shared Use Roads Only, Groundhog Rock Crawl Pit | All year, some trails affected by Green Dot Closure in October | 318 miles of easy to most difficult trails |

[21] Monitoring has shown a high level of compliance on designated trail systems in central Oregon managed by COHVOPS (98% over the past 18 months). The referenced monotiring data is available at Crescent Ranger District.
[22] Source: Oregon Parks and Recreation Department : <http://atv.prd.state.or.us/places.php>

| Name | Managing Agency | Location | ATV Classes | Season | Description |
|---|---|---|---|---|---|
| Edison Butte | Deschutes National Forest | 24 miles SW of Bend | I, II and III | Closed Dec 1 through March 31 except for Class I vehicles | 25 miles of more to most difficult trails. Restricted to vehicles under 80 inches |
| 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 |
| 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 |
| Cline Buttes | Prineville BLM | 9 miles N of Bend on Hwys 20 and 126 | I, II, and III | Generally, most trails open dependent upon snow | Up to 90 miles for various class of vehicles with varied terrain |
| Millican/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 |
| 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 |
| North Millican | Prineville BLM | 24 miles E of Bend off Hwy 20 | I and III, Class II on Shared Use Roads Only | Closed Dec 1 through April 30 | 102 miles of easiest to most difficult trails; 24 miles open to Class II |
| Millican Plateau | Prineville BLM | 20 miles NE of Bend on George Millican Road | I and III, Class II on Shared Use Roads Only | All Year | 111 miles of easiest to more difficult trails; 37 miles open to Class II |
| South Millican | Prineville BLM | 22 miles E of Bend off Hwy 20 | I and III, Class II on Shared Use Roads Only | Closed Dec 1 through April 30 | 43 miles of easiest to more difficult trails; 11 miles open to Class II |
| Huckleberry Flat | Willamette National Forest | 12 miles N. of Oakridge | I and III | All Year | 33 miles of easiest to most difficult trails. |
| Santiam Pass | Willamette National Forest | 22 miles west of Sisters | I, II, and III | Mid-June-mid-November (snow free) | 49 miles of mostly easiest to most difficult trails. |

Currently, there are no designated trail systems for OHVs on the Crescent Ranger District. However, there are approximately 410 miles of user-identified OHV routes. These routes include 114 miles of user-created trails and 296 miles of open and closed roads. These routes were identified by the user during scoping and agency personnel during field reconnaissance. The greatest OHV use is currently focused in and around the Two Rivers North subdivision, in the Crescent Lake area, and in the Walker Mountain area, particularly during hunting season. Although the Forest Service does not have statistically valid use numbers for OHVs on the district, forest personnel have observed riders and a growing network of user-created trails in these areas.

The Two Rivers North subdivision area can be characterized as having two types of use; unimpeded riding and quiet recreation. There are approximately 400 residents of the subdivision, which are mostly part-time residents with primary homes elsewhere. It is estimated approximately 50 percent occupancy occurs at any one time. As a result of a meeting held with the residents proposing the Three Trails OHV project, the Forest Service heard that many of them moved to Two Rivers North subdivision area to ride unimpeded.

The second type of use is the non-motorized or quiet recreation. A subset of users from the Two Rivers North subdivision area enjoys hiking, mountain biking, fishing, and horseback riding where they can get out and enjoy the sounds of nature. There have been no documented conflicts between the motorized versus non-motorized users. However, non-motorized users expressed concerns during scoping about the noise from late night OHV riding in Muttonchop Butte play pit. A Project Design Feature that incorporates the same quiet hours for Forest Service campgrounds would be applied to Muttonchop Butte play pit.

The other types of use Forest Service personnel have heard from is the organized groups and families that use the area as a weekend or holiday destination from Oakridge, Eugene, Springfield, Salem, Roseburg, and Klamath Falls and come either self-contained in motorhomes, use the local resorts or motels, or camp at Emigrant crossing, Mowich crossing, the disbanded Deschutes river campground, or the ODOT borrow site. The use is primarily OHVs and motorcycles. These riders use trails all through the planning area because of the low rainfall and relatively open nature of the terrain. These motorized enthusiasts are more geared toward traveling longer distances and discovering previously undiscovered areas. This trail experience involves cross-country travel resulting in user-created trails and play areas. It also has created some trails where riders have forged into inappropriate areas such as across the Little Deschutes River. Season of use is determined by snow level and runs from May through November.

Using estimates of local and non-local riders in the Two Rivers North area, there are approximately 100 riders during average summertime weekends. This estimate is based on numbers of vehicles with trailers parked in established areas, number of people with OHVs observed camping, interviews with local business owners and OHV club members, and the number of residents that likely ride from their residences. On the holiday weekends of Memorial Day, the 4$^{th}$ of July, and Labor Day, it is estimated that rider numbers double to approximately 200 riders as people visit those that have a house in the subdivision as well as non-local riders that disperse camp or stay in a developed campground around Crescent Lake. It also is estimated eighty percent of them originate from the Two Rivers North subdivision with the remainder from non-local areas.

In the Crescent Lake Junction area, about 50 percent of the riders using this area are residents of the Diamond Peaks and Royce Mountain subdivisions where many residents also own an OHV. The other half of the riders come from visitors to the resorts, campers from Oakridge, the Summit Lake road, and from Davis Lake and Wickiup Reservoir. The resort owners estimate that about five percent of their guests use OHVs per day – an average of 24 per day.

Hunting season is probably the most focused recreational use of the planning area. Hunting camps are scattered across the area with larger ones occurring in the Walker Mountain area, along the Little Deschutes River, and Hemlock Creek near Two Rivers North Subdivision.

Many hunters use vehicles extensively to access campsites, scout for game, and retrieve game. This impacts the hunting experience of those using more traditional methods of access, such as foot, or horses. There is a division between many hunters, some who believe that 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.

Currently, both use by and values associated with, non-motorized use and quiet recreation overlapping the Three Trails OHV project area are low to non-existent during summertime. Most non-motorized trails on the Crescent Ranger District are located outside the project area in the Oregon Cascade Recreation Area and Wilderness. Few conflicts currently exist between non-motorized users and motorized users because OHV enthusiasts are spread over a large area. These assumptions are based on recreation specialists who are skilled at how visitors are using the Crescent Ranger Disitrict and local knowledge from long-term residents.

In the Walker Mountain area, use outside of hunting season is estimated to be 50 riders on a typical weekend. These users originate from the communities of Crescent/Gilchrist and from Chemult to the south. Local riders also traverse the area on their way to the Fremont-Winema National Forest. Other than local use, some use originates from mostly self-contained recreational vehicles (RVs) campers using the Boundary Springs camping area. The Forest Service estimates that use doubles to around 100 riders during the hunting season (October-November), when approximately 21 inventoried dispersed sites east of Highway 97 and at the base of Walker Mountain are occupied with multiple OHV machines.

**Table 19. Estimated Amount of Current Use in the Three Trails Planning Area**

| Sub Area | # of OHVs – Summer weekends | # of OHVs – Holiday weekends | # of OHVs – Hunting season |
|---|---|---|---|
| Junction | 100 | 200 | 100 |
| Rivers | 100 | 200 | 100 |
| Walker | 50 | 50 | 100 |

Many of the local motorized enthusiasts have expressed a preference for “driving for pleasure.” While they also seek the experience of non-locals, these local riders are more likely to drive on roads and are more focused on access to neighbors, neighboring communities, favorite sites, roads, views, and loops. Local users include enthusiasts from Gilchrist, Crescent, Crescent Lake Junction, and Two Rivers North. Each of these communities contains both seasonal residents and year round residents. Many people from west of the Cascade Range have second homes in these communities.

Thousands of acres of former industrial forest land private land near the towns of Crescent and Gilchrist are used extensively by OHVs. In addition, the State of Oregon has acquired some of these as a working State forest that would include recreation uses such as motorized travel. Representatives from the Oregon Department of Forestry have indicated future OHV opportunities would continue.

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 and to OHV users. According to Cordell (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 et al. 2008b). This data is displayed in Table 12 and Table 13 for the purpose of comparing Deschutes National Forest visitor participation against national visitation.

The Crescent Ranger District has identified approximately 113 miles of non-designated, user-created OHV trails within the Three Trails OHV project area, where most of the use is occurring on the district. For some, they provide the experience riders desire. However for others, these trails are generally of low

to moderate value because they lack flow, connectivity, and loops. In general, there is no organization to the trails and they have been developed haphazardly as riders continue to use certain routes. OHV riders also use approximately 300 miles of roads.

The following Table 20 provides a qualitative description of the OHV experience based on number of miles, ride times, and the number of play areas and scenery. This is then followed by Table 21 displaying the existing experience in the Three Trails OHV project area.

**Table 20. Value of OHV Experience by Vehicle Class**

| Miles of Class I ATV Trail (e.g. quad, 4-wheeler) | Value | Rider Experience in 1 day[23] |
|---|---|---|
| 41 to 80 | High Value | Ride time of 8 hours with numerous views and play areas |
| 16 to 40 | Moderate Value | Ride time of 4 hours with few views and play areas |
| 0 to 15 | Low Value | Ride time of 2 hours or less with no views or play areas |
| | | |
| Miles of Class II ATV Trail (e.g. Jeep, side-by-side) | Value | Rider Experience in 1 day |
| 26 to 50 | High Value | Ride time of 12 hours with more than 4 views and play areas |
| 11 to 25 | Moderate Value | Ride time of 6 hours with between 2-4 views and play areas |
| 0 to 10 | Low Value | Ride time of 3 hours or less with no views or play areas |
| | | |
| Miles of Class III Trail (e.g. Motorcycle) | Value | Rider Experience in 1 day |
| 51 to 100 | High Value | Ride time of 12 hours with more than 4 views and play areas |
| 26 to 50 | Moderate Value | Ride time of 6 hours with between 2-4 views and play areas |
| 0 to 25 | Low Value | Ride time of 3 hours or less with no views or play areas |

The number of miles and experiences are based on Crimmins 2006 and anecdotal information provided by Central Oregon Off Highway Vehicle Operations personnel.

[23] Based on riders preferences of length of ride time, play areas, viewpoints, amenities etc.

**Table 21. Existing Trail Value and Experience in the Three Trails OHV Planning Area**

| Class of Trail | Existing Miles of Non-Designated OHV Trail* | Value | Rider Experience |
|---|---|---|---|
| Class I (3- and 4-wheelers ) and Class III | 61 | Moderate | Lacks flow, connectivity, loops, and signing[24] |
| Class II (jeeps, side-by-sides, etc.) | 49 | Low | Mostly road, not trail<br>Lacks flow, connectivity, loops<br>Low Technical Level<br>2 or less Play Areas<br>2 or less View Points |
| Class III (motorcycles) | 3 | Low | Majority of Class III Trails have become Class I Trails |

*These trail miles are the Forest Service's best estimate, but may not precisely reflect what is on the ground.

OHV users are a diverse group with varying desires and expectations. Not all vehicle classes perform the same on any given terrain or trail layout (Crimmins 2006). Some user separation would enhance specific rider experiences. On the other hand, providing separate trails for different vehicle classes can be expensive, cause resentment, be difficult to enforce, and limit opportunities for communication and cooperation (FHWA 1994).

The separation of classes of vehicles was made of particular concern for some four-wheel, ATV and motorcycle riders as they expressed their preferences during Three Trails OHV project public meetings. Some motorcycle enthusiasts want only single-track trails (6 - 24 inches wide). Maintaining trails for this experience means excluding four-wheel ATVs. On the other hand, it is common for a family or group of friends to visit the Forest with more than one vehicle class in tow. Such a group usually would prefer routes open to more than one vehicle class.

Additionally, riders of Class II vehicles (jeeps, side-by-sides, etc.) are interested in designated motorized trails instead of roads.

Play areas and small, confined, open areas (such as mineral sources or pits) where use is not limited to trails, often provide OHV riders the opportunity to find challenge in an appropriate manner. Although not limited solely to OHV riders, scenic views such as vistas, volcanoes, and lava flows are desired destinations.

OHV riding is a dispersed activity, and although riders often recreate with friends or family, they are often looking for a sense of solitude. When trails are placed far apart, this sense of solitude can be found more often than if trails are placed closely together.

### Direct and Indirect Effects

#### *Assumptions and Methodology for Recreation Use and Trends*

The 2008 NVUM for the Deschutes National Forest estimated that there were approximately 1.9 million recreation visits to the forest each year (USDA Forest Service 2009c). Table 22 shows the activities in

[24] Also, there are opposing opinions on rider value as it relates solely to number of miles of trail. Some believe the existing layout of user-created trails is of high value. Others desire a more engineered trail system. For this analysis, high miles of trail with access to scenery and play areas rank high in rider experience.

which people participated during their visits to the Deschutes National Forest. By using this survey data and trends in the number of people participating in recreational activities (NSRE data) from Table 22, it is predicted that in the next 10 years, the activities with the greatest growth (in terms of total participants multiplied by percent change) would be wildlife/birds, general relaxing, viewing other features, hiking/walking, fishing and driving for pleasure. The activities with the least growth is predicted to be backpacking, cross-country skiing, snowmobiling, horseback riding, and other motorized activity (USDA Forest Service2005; NSRE Report 2005).

**Table 22. Trends in Number of People Participating and Number of Participation Days for Selected Outdoor Recreation Activities in the United States, 1999-2008**

| 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 |

Excerpted from Cordell et al. 2008b. Source: NSRE 1999-2001 and 2005-2008. Missing data indicate that either participation or annual days were not collected during that time period.

Population is the major influence in recreation growth in the United States (Cordell 2004). If the population of the market zone increases (where the majority of visitors come from), the recreation use increases. It is highly likely that the population would grow in counties where visitors to central Oregon live, resulting in increased recreation use of the Deschutes National Forest.

NVUM found that for the Deschutes National Forest, forty-three percent of the forest visitors come from Deschutes and Crook Counties. If visitors from Lane County are added, forty-eight percent come from these three counties. Seventy-five percent of the visitors come from 15 counties in Oregon including those in the Portland area (USDA Forest Service 2009c). In predicting future recreation growth, it is important to look at population predictions in these 15 counties, but especially Deschutes, Crook, Klamath, and Lane counties.

Since 2000, Bend (the largest community near the Deschutes National Forest and only 50 miles north of the project area) grew at the fastest rate (45 percent) in the State and saw the largest increase in the number of persons after the Portland area. Even now, people whose motivations are not completely economically oriented continue to move to Oregon. Among them are college-educated outdoor-minded young adults, retirees, and immigrants (Proehl 2009). Many of these people visit the National Forest frequently.

As of July 2009, the unemployment rates for Deschutes and Crook counties were well above rates for Oregon and the U.S. (Oregon Employment Department 2009). This may have an effect on the population of Deschutes and Crook counties. The unemployment rate for Lane County was slightly higher than for Oregon as a whole.

**Table 23. Unemployment Rates (seasonally adjusted) for Counties within the Market Zone for the Deschutes National Forest**

| Area | July 2009 | June 2009 | July 2008 |
|---|---|---|---|
| U.S. | 9.4% | 9.5% | 5.7% |
| Oregon | 11.9% | 12.0% | 6.3% |
| Klamath County | 13.5% | 14.8% | 7.7% |
| Crook County | 18.7% | 22.4% | 9.0% |
| Deschutes County | 15.3% | 15.6% | 7.5% |
| Lane County | 12.5% | 12.9% | 6.5% |

Source: Oregon Employment Department, 2009

The current slowdown in Oregon's economy is expected to result in a slowing population growth in the short-term with implications for the long-term forecast horizon. In general, the number of people moving to Oregon is related to economy and the employment situation of the state. Current high unemployment and job loss would impact net migration and population growth, but possibly not by a tremendous amount because other states are not faring any better. The potential residents leaving the state have very limited destination choices (Oregon Office of Economic Analysis 2009).

Despite the economic condition, the State of Oregon is forecasting that the state population would continue to increase at a modest level (Oregon Office of Economic Analysis 2009). The factors such as great outdoor recreation and sunshine 300 days a year induce the college-educated outdoor-minded young adults and retirees to move to central Oregon.

***Predicted OHV use in the Three Trails OHV Planning Area***

The action alternatives identify a lengthy user-created trail system existing in three main areas; Crescent Lake Junction, Two Rivers North subdivision, and Walker mountain. Associated actions identified up to 96 miles of these trails to be closed or rehabilitated, which is a loss of opportunity to many riders. Given this existing use, it is hard to predict how many OHV riders would use a newly designated trail system in Three Trails OHV project area, but it is likely that more people would use the trail system in the future than use the user-created trails now. Use is likely to increase because of several reasons.

Overall demand for OHV riding opportunities in the Forest would increase in the long term (Cordell et al. 2008b; Bergeson et al. 2005). In the short term, however, fuel prices and the recession are hurting OHV recreation (Albright 2008). Rather than abandon the sport altogether, OHV enthusiasts are predicted to recreate closer to home. For central Oregon residents, the Deschutes National Forest is 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 (Bergeson et al. 2005). As the recession abates, it is likely that

Oregon counties would recover economically and continue growing. This continued population growth would likely result in increased recreation use of National Forests.

If a trail system is designed well, has adequate facilities, and is designated, OHV riders would come. If a trail system uses Oregon ATV grant monies, the system would be included on the State web site and brochure. Research shows that OHV riders are willing to travel more than 100 miles (Bergeson et al. 2005), so that if the trails system is advertised, people from around the state would more than likely visit the area. If the riders like the trail system, they would return.

***The Three Trails OHV project estimates visitation to the trail system to be between 2.5-5.6 percent over the next decade.*** This assumption is based upon the following:

- 2003-2007 Oregon Statewide Comprehensive Outdoor Recreation Plan (SCORP) especially Chapter 4 on Outdoor Recreation.
- Cordell, 2008. The Latest on Trends in Nature-based Outdoor Recreation Activity.
- Cordell et al. 2008. Outdoor Recreation Activity Trends: What's Growing, What's Slowing? (A Recreation Research Report in IRIS Series, September 2008).
- Cordell et al. 2008. Off-Highway Vehicle Recreation in United States and its Regions and States: An Update National Report from the National Survey on Recreation and the Environment (NSRE).

Based on the State SCORP data of a 38 percent increase for ATVs between 1987-2002 (2.5 percent annual increase) and Cordell's 2008 data with a 56.1 percent increase over the past decade (5.6 percent increase), the predictability of an annual growth rate for our area is estimated to be 2.5 to 5.6 percent per year over the next decade. There are several assumptions that interdisciplinary team discussed:

- The downward trend over the last couple of years would not likely continue as the economy becomes stronger and riders become used to a State of Oregon requirement for training of young OHV riders.
- Participation initially would be at the lower end of the estimate of use as the trail construction is phased in--incremental improvements over a number of seasons that do not usually trigger a large sustained surge in use.
- Once the Travel Management Rule is implemented, there would be no other places to ride other than existing designated trail systems, and those that are in place would likely increase in visitation over existing levels.
- Weather conditions preclude use in the Three Trails OHV area much of the year and reduces the overall opportunity.
- OHV users base their destination decisions on a number of variables that range from weather-related trail conditions to the desire for variety within a given riding season, from the time and money they can devote to traveling to a riding area to their choice of riding partners.
- Word of mouth of a well designed and managed trail system would contribute to the visitation.
- A similar project on an adjacent forest has not seen exponential growth since its implementation over the last year[25].
- Although one number does not establish a trend, the North Millican OHV area experienced 9985 riders in 2008 (316 riders per week of operation). It has similarity to the Three Trails OHV project in the season of use, trail miles, and terrain. Table 19 estimates the Three Trails OHV area currently experiences 250-450 riders on weekends. Although North Millican is an established trail

[25] Conversation with Wendy Zustiak, Forest OHV Program Coordinator, Middle Fork Ranger District, Willamette National Forest

system, its number of riders is similar to those that currently use the Three Trails OHV user-created system.

***Key Issue #1. How the Alternatives Provide the Proper Design to Provide the Experience Rider's Want***

The following attributes and measures would be used to compare alternatives:

1. System layout (miles of trail by Class of vehicle).
2. Number of play areas and scenic viewpoints.
3. Whether the alternative contains a developed staging area.
4. OHV trail densities.

Successful OHV route systems provide for sufficient traveling distance, play areas, and scenic views. They also have adequate trailhead and staging area facilities, which include parking, restrooms, drinking water, and picnic or camping opportunities. In addition, OHV riders want to recreate in a dispersed setting where they feel some level of solitude (Crimmins 2006). Riders tend not to support a system that does not meet their needs. If riders do not use the system, they create additional trails and additional enforcement personnel can be required[26]. Table 21 describes the adequacy of riders' experiences based on number of miles in the route system and other factors.

The alternatives were evaluated by measuring and comparing the number of miles of connected OHV trails in each subarea by each vehicle class. Although the OHV trails are connected via motorized shared-use roads, each subarea (Junction, Rivers, and Walker) is evaluated separately because in general, OHV riders prefer a trail experience. To provide a basis of comparison for this issue, a qualitative descriptor (high, moderate, or low value) was assigned to a range of contiguous route miles to describe the adequacy of an experience (based solely on the sufficiency of miles) for each vehicle class for a one-day trip (Table 20) and are based on information in Crimmins' 2006 publication.

**System Layout**

Alternatives were also evaluated by measuring and comparing the number of miles of OHV routes for Class II (jeeps, etc) and Class III (motorcycles) alone. More miles are preferable for this measure. As in the traveling distance section, a qualitative descriptor was assigned to the miles to describe the adequacy of an experience for the vehicle class within the subarea. The value ratings are described in Table 24, Table 26, and Table 27 are based on information in Crimmins' 2006 publication.

**Play Areas and Scenic Views**

Alternatives were evaluated by comparing the number of play areas and scenic viewpoints in each alternative, and assigning the number a value: low, medium, or high. The values are based on Table 24 (Crimmins 2006). Presence of many, few or no views, or play areas would likely affect a rider's experience.

**Table 24. Value of an OHV Area Based on Play Areas and Scenic View Points**

| Play Areas | | Scenic Viewpoints | |
|---|---|---|---|
| Number | Value | Number | Value |
| 0-1 | Low | 0-1 | Low |
| 2-3 | Moderate | 2-3 | Moderate |
| 4+ | High | 4+ | High |

[26] Vicki Ramming, Central Oregon Combined Off-Highway Vehicle Program Manager

**Staging and Camping Areas**
Table 25 describes the attributes of different types of proposed staging and camping areas within the Three Trails OHV project area.

**Table 25. Description of Staging and Camping Areas**

| Amenities | Fully developed (3-5 acres) | Semi-developed (2-3 acres) | Semi-primitive (1-2 acres) | Developed Camping Areas |
|---|---|---|---|---|
| Campsites | X | | | X |
| Parking area | X | X | X | X |
| Toilets | X | X | | X |
| Tot lot or Learner loop* | X | | | |
| Young Teen area** | X | | | |
| Picnic tables | X | X | | X |
| Fire rings | X | X | | X |

* Tot lot- small riding area for young children where they are under constant parental supervision
** Area where young teens can learn to ride

Staging areas would be built to accommodate vehicles with ATV trailers but all user groups are welcome. Camping would be allowed at most staging areas and Junction Sno-Park has nearby private camping opportunities. Semi-primitive staging areas would not have toilets or other amenities.

A desirable trail system would have at least one developed staging area (fully-developed or semi-developed staging area or a camping area) in which they could camp in each sub-unit (Junction, Rivers, Walker). The alternatives were evaluated on whether or not they contain a developed staging area.

**Trail Densities**
OHV riding is a dispersed activity, and although riders often recreate with friends or family, they are often looking for a sense of solitude. When trails are placed far apart, this sense of solitude can be found more often than if trails are placed closely together. To measure how close trails are to each other, the Three Trails OHV project area was divided into 11 density analysis blocks of trails that can be used without riding on shared-use roads (Figure 12). The trail density was then computed in miles of OHV trail per square mile within these blocks. Although no data exists to determine the ideal trail density from a rider's standpoint, the assumption presented by the Central Oregon Off-Highway Vehicle Operations (COHVOPs) personnel approximated four trail miles per square mile as the preferable density. Therefore, the analysis highlights those blocks in which the density is greater than four trail miles per square mile as listed in Table 30. These include Bunny Butte, North Mowich, Side Hill, Gilchrist Sliding, Powerline, Ten Mile, Muttonchop, and Sno-Park (Figure 12).

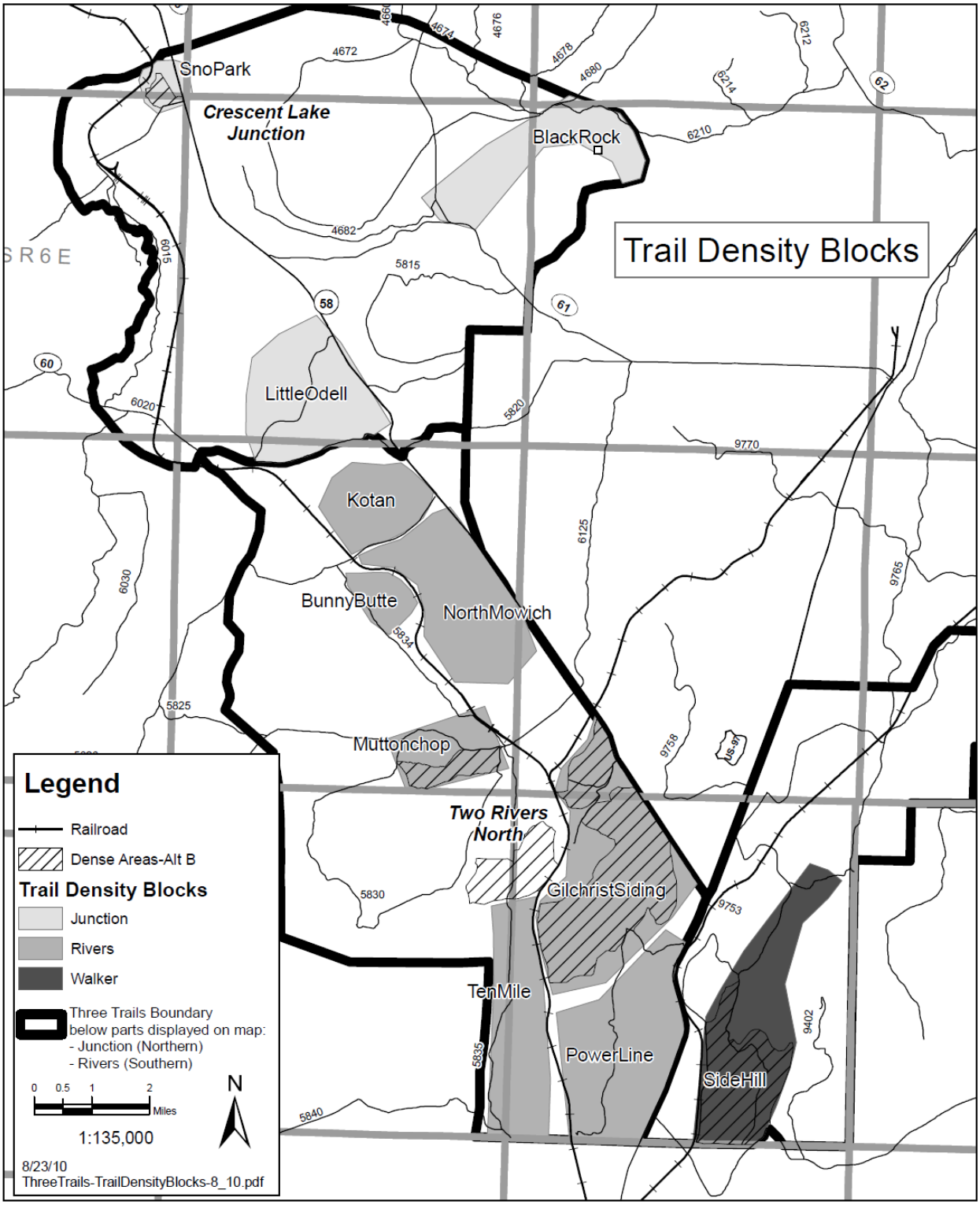


**Figure 12. Trail Density Blocks**

### Rider's Experience by Traveling Distance

Table 26 displays the number of miles of OHV trail by alternative. The table does not distinguish between trail miles and roads used as trails or roads converted to trails in the action alternatives. Routes

were mapped using information obtained by the users themselves, agency personnel who specialize in motorized recreation, and Geographical Information Systems terrain data. This table reflects the best on-the-ground information on the use that is occurring by class of vehicle and trail miles includes roads that are converted to trails.

**Table 26. Miles of OHV Trail and Assigned Value by Vehicle Class by Alternative**

| | | Alternative A | | Alternative B | | Alternative C | | Alternative D | | Alternative E | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | OHV CLASS | Total Trail Miles | Value | Total Trail Miles | Value | Total Trail Miles | Value | Total Trail Miles | Value | Total Trail Miles | Value |
| Junction | I, III | 40 | Mod. | 20 | Mod. | 24 | Mod. (I) Low (III) | 16 | Mod (I) Low (III) | 18 | Mod. (I) Low (III) |
| | II | 0 | None | 0 | None | 12 | Mod. | 0 | None | 16 | Mod. |
| | III | 0 | None | 0 | None | 0 | None | 0 | None | 7 | Low |
| | Total | 40 | | 20 | | 36 | | 16 | | 41 | |
| Rivers | I, III | 225 | High | 108 | High | 68 | High | 109 | High | 75 | High |
| | II | 96 | High | 0 | None | 0 | None | 0 | None | 0 | None |
| | III | 5 | Low | 0 | none | 12 | Low | 12 | Low | 12 | Low |
| | Total | 326 | | 108 | | 80 | | 121 | | 87 | |
| Walker | I, III | 44 | High (I) Mod. (III) | 0 | None | 15 | Low | 4 | Low | 4 | Low |
| | II | 0 | None | 15 | Mod. | 22 | Mod. | 10 | Low | 10 | Low |
| | III | 0 | None | 0 | None | 0 | None | 0 | None | 0 | None |
| | Total | 44 | | 15 | | 37 | | 14 | | 14 | |
| **TOTAL** | | **410** | | **143** | | **153** | | **151** | | **142** | |

Table 27 displays miles of engineered trail for jeeps and other 4-wheel drive vehicles, single track for motorcycles which includes adoption of existing user-created trail, new trail construction, or roads converted to trail, but not shared use roads. The value ratings described in Table 27 are based on information in Crimmins' 2006 publication.

**Table 27. Trail Miles for Jeeps/4-wheel drive vehicles and Motorcycles with Values Assigned by Alternative**

| Area | OHV CLASS | Alt A | Alt B | Alt C | Alt D | Alt E |
|---|---|---|---|---|---|---|
| Junction | II | 0 | 0 | 12 Moderate | 0 | 16 Moderate |
| | III | 0 | 0 | 0 | 0 | 7 Low |

| Area | OHV CLASS | Alt A | Alt B | Alt C | Alt D | Alt E |
|---|---|---|---|---|---|---|
| Rivers | II | 96 High | 0 | 0 | 0 | 0 |
| | III | 6 Low | 0 | 11 Low | 11 Low | 11 Low |
| Walker | II | 0 | 15 Moderate | 22 Moderate | 10 Moderate | 10 Moderate |
| | III | 0 | 0 | 0 | 0 | 0 |
| Total II | II | 95 | 15 | 34 | 10 | 26 |
| Total III | III | 6 | 0 | 11 | 11 | 18 |

**Play Areas and Scenic Views**

Table 6 displays the play areas, campgrounds, and staging areas while Table 7 displays the scenic viewpoints that would be accessible to OHVs in each alternative and Figure 13 displays the location of these features. Table 28 summarizes number of play areas and scenic viewpoints by alternative and assigns a value to both of these attributes.

**Table 28. Number of Play Areas and Scenic Viewpoints by Alternative**

| Alternative | Number of play areas | Value based on play areas | Number of scenic viewpoints accessed by trail system | Value based on viewpoints |
|---|---|---|---|---|
| A | 2 | Moderate | 9 | High |
| B | 1 | Low | 2 | Low |
| C | 2 | Moderate | 9 | High |
| D | 1 | Low | 3 | Moderate |
| E | 2 | Moderate | 8 | High |

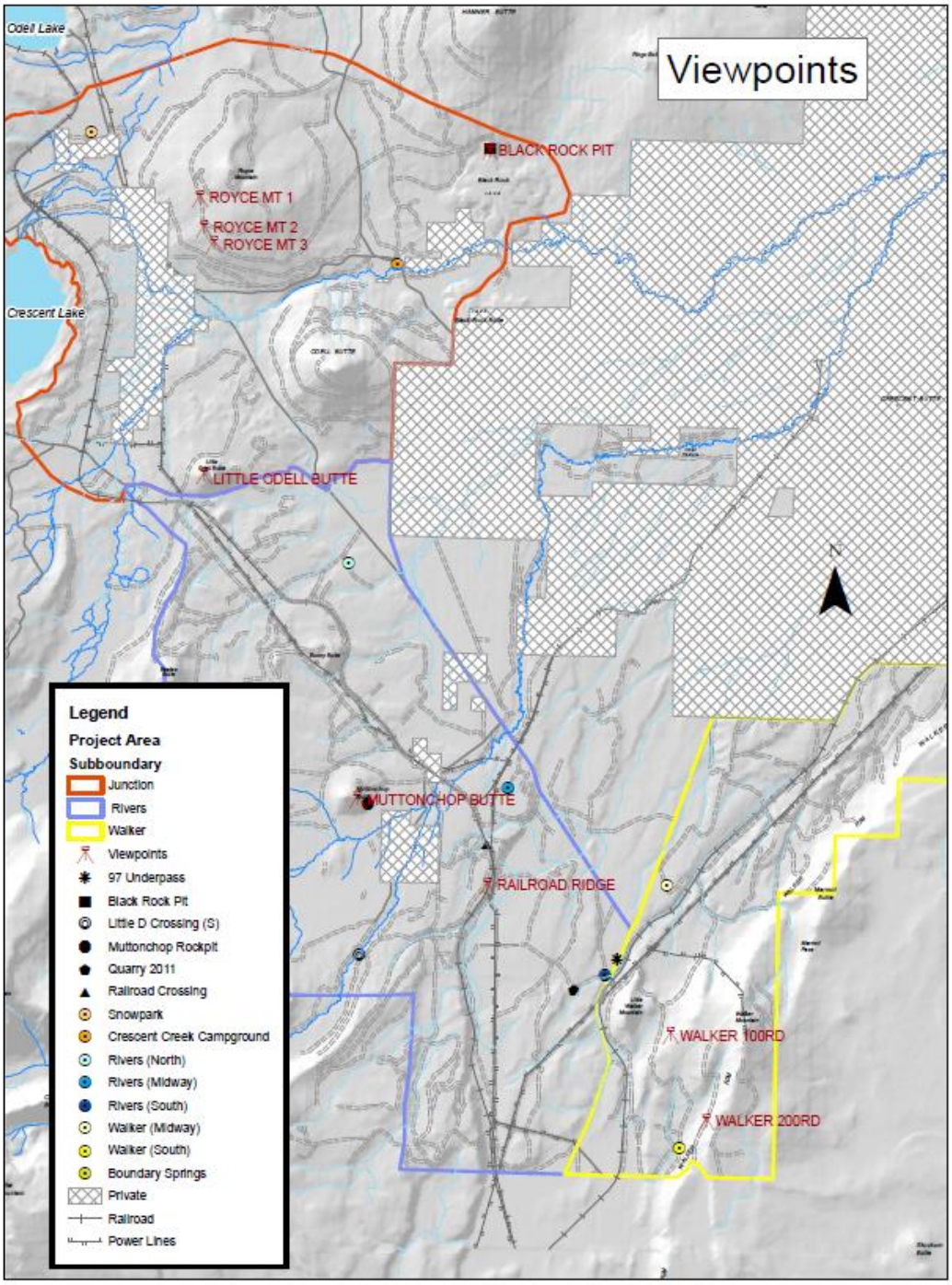


**Figure 13. Location of Viewpoints, Play Areas, and Staging Areas**

## Staging and Camping Areas

Table 29 displays the staging and camping areas that would be available in each alternative. Table 25 describes the level of development and amenities that would be available.

**Table 29. Staging Areas by Alternative**

| Sub Area | | Alt A | Alt B | Alt C | Alt D | Alt E |
|---|---|---|---|---|---|---|
| **Junction** | Junction Sno-Park* | SP | SP | SP | SP | SP |
| | Crescent Creek Campground | | | D | | |
| | Simax Group Campground | | | D | D | D |
| **Rivers** | Rivers North | | | FD | FD | FD |
| | Rivers Midway | | FD | FD | | |
| | Rivers South | | SP | SP | SP | SP |
| **Walker** | Walker Midway | | FD | FD | | |
| | Walker South | | | SD | SD | SD |
| | Boundary Springs Campground | | | D/SP | | |

*Junction Sno-Park has paved and defined parking and toilets but no other facilities. Otherwise, it meets the definition of a semi-primitive staging area. Overnight camping is not allowed in the summer months and nearby accommodations are provided by private businesses and Forest Service developed campgrounds.
SD-Semi-developed
SP-Semi-primitive
FD-Fully developed
D-Established Campground

## Trail Density

Table 30 displays the trail densities of eleven blocks where trails are concentrated and Figure 12 shows the block locations within the Three Trails OHV project area. The higher the trail density, the more likely a rider would encounter other riders and experience dust and noise.

**Table 30. Trail Density**

| | | Alternative A[27] | | Alternative B | | Alternative C | | Alternative D | | Alternative E | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Density Analysis Area | Square miles | Trail Miles | Trail miles per mile$^2$ | Trail Miles | Trail miles per mile$^2$ | Trail Miles | Trail miles per mile$^2$ | Trail Miles | Trail miles per mile$^2$ | Trail Miles | Trail miles per mile$^2$ |
| Black Rock | 3.3 | 1 | 0.2 | 0 | 0.0 | 11 | 3.3 | 0 | 0.0 | 7 | 2.2 |
| Little Odell | 4.2 | 0 | 0.0 | 0 | 0.0 | 11 | 2.7 | 4 | 0.8 | 11 | 13.2 |
| Sno-Park | 0.7 | 9 | 14.2 | 21 | 31.8 | 9 | 13.3 | 9 | 13.3 | 9 | 13.3 |
| Bunny Butte | 0.8 | 4 | 4.4 | 0 | 0.0 | 4 | 4.7 | 5 | 5.5 | 4 | 4.7 |
| Gilchrist Siding | 7.2 | 33 | 5.7 | 60 | 8.3 | 13 | 1.8 | 13 | 1.7 | 8 | 1.1 |
| Kotan | 2.2 | 2 | 0.8 | 0 | 0.0 | 9 | 4.0 | 22 | 10.2 | 9 | 4.0 |
| Muttonchop | 2.0 | 23 | 11.9 | 25 | 12.7 | 9 | 4.5 | 0 | 0.0 | 5 | 2.8 |
| North Mowich | 4.6 | 15 | 5.2 | 0 | 0.0 | 13 | 2.8 | 27 | 6.0 | 11 | 2.5 |

[27] For this analysis, user-created trails are compared to engineered trails in the action alternatives. Following implementation of the central Oregon Travel Management Rule, user-created trails would no longer be available if Alternative A was selected.

| | | Alternative A[27] | | Alternative B | | Alternative C | | Alternative D | | Alternative E | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Density Analysis Area | Square miles | Trail Miles | Trail miles per mile$^2$ | Trail Miles | Trail miles per mile$^2$ | Trail Miles | Trail miles per mile$^2$ | Trail Miles | Trail miles per mile$^2$ | Trail Miles | Trail miles per mile$^2$ |
| PowerLine | 5.4 | 21 | 5.8 | 4 | 0.6 | 10 | 1.8 | 35 | 6.6 | 31 | 5.8 |
| Ten Mile | 3.8 | 23 | 7.4 | 5 | 1.3 | 11 | 3.0 | 11 | 3.0 | 11 | 3.0 |
| Side Hill | 5.5 | 30 | 5.4 | 15 | 2.6 | 16 | 2.9 | 10 | 1.8 | 10 | 1.8 |

**Alternative A (No Action)**
Alternative A has by far the most total trail miles (410) for all classes of motor vehicles (Table 26). It is estimated the user-created trail system has expanded at least two to five miles on a yearly basis. Although merely having the most trail miles is a very subjective process, the existing users have expressed satisfaction with the current condition; therefore for this analysis, the highest value based on number of trail miles was assigned. It is acknowledged that other users may not agree and desire a trail system to be more planned and engineered, such as in the proposed actions. However, implementation of the Travel Management Rule would allow travel on designated routes such as most high clearance roads and no user-created trails. Therefore, the value based on available trail miles would be lower than the action alternatives once this rule is implemented.

This alternative allows access to all the known play areas which are associated with pits for mineral extraction - Muttonchop and Black Rock. It also has access to all the available viewpoints identified in this analysis: Little Odell Butte, Black Rock Pit, three on Royce Mountain, Railroad Ridge, Muttonchop Butte, and two on Walker Mountain.

For dispersed camping and staging, it is assumed riders would continue to use the area as they have in the past; although this alternative has no organized facilities designed specifically for parking, camping, and dispersal into a nearby trail system. Areas such as Junction Sno-Park are available for day use, riders would continue to utilize known user-created parking sites such as along the Little Deschutes River for the Rivers subarea or one of the businesses at Crescent Lake Junction. In the Walker subarea, riders that are not camping overnight in one of the dispersed sites would need to ride a long way from a staging area to access the area.

For trail density, eight of the 11 analysis areas contain more than four miles per square mile (Table 30). This is the most dense trail system of any alternative. However, due to the current unrestricted nature of trail riding in most management allocations and local ridership versus a designated system with information provided in various media outlets, this alternative likely provides the most solitude.

**Alternative B (Proposed Action)**
Alternative B is similar to Alternative E with a comparable amount of trail miles (143 versus 142) for ATVs and motorcycles. This alternative also has the lowest amount of high and moderate value subareas. It would provide only 15 miles of trail for jeeps and other 4-wheel drive vehicles in only one area – which rates it as moderate value for rider's experience. It would not provide any single-track trail for motorcycles.

Compared to the other alternatives, this alternative is the least desirable for providing play areas and scenery from a viewpoint. Muttonchop Butte Pit and views from that butte are the only opportunities for those experiences.

Alternative B provides a desirable trail system in terms of staging areas because Junction Sno-Park and

private businesses are available in Junction, two staging areas (one fully developed) is available in Rivers, and one in Walker.

For trail density, this alternative contains three analysis areas with more than four miles per square mile. It also provides the greatest trail density at Junction with 31.8 miles per square mile. In terms of rider's experience for solitude this alternative would be among the lowest. In addition, this alternative would have a greater likelihood of experiencing dust and noise during prime periods of use, which would be during spring and fall seasons.

**Alternative C**

Of the action alternatives, Alternative C has the highest amount of miles of trail (153). It also has the most number of high and moderate value areas of the action alternatives. It would provide 34 miles of Jeep/other 4-wheel drive vehicle trail in two different areas, both of which have enough miles to rate a moderate value for rider's experience. This alternative also provides 11 miles of single track motorcycle trail which would rate a low value experience based on miles.

This alternative designates access to the two existing play areas in pits, Muttonchop Butte and Black Rock. This alternative has access to the identical viewpoints as in Alternative A. Not all viewpoints are accessible from an OHV trail, but OHVs can access the viewpoints on the designated trail system via a shared-use road if not from a trail.

Alternative C provides the most desirable trail system in terms of staging areas. In addition to the opportunities at Junction as described in Alternative B, there are three (two fully developed) in Rivers, and three in Walker (two fully developed), which includes linkage to Boundary Springs Campground in Walker. Riders could easily park and camp in the area where they want to ride.

Although this alternative contains three analysis blocks with trail densities greater than four miles per square mile, it is the least dense of all the action alternatives. This would mean riders would be least likely to encounter other riders and noise and dust.

**Alternative D**

Alternative D has higher total miles (151) than the other action alternatives (except Alternative C which has 153 miles), but because the trails are concentrated in fewer areas, it has fewer high and moderate value subareas. It provides 10 miles of Jeep/other 4-wheel drive vehicle trail, and 11 miles of single track motorcycle trail, neither of which are long enough to rate more than a low value for rider's experience.

Quarry 2011 is this alternatives substitute for Muttonchop Butte and Blackrock play areas. It offers a similar recreation experience as Black Rock and Muttonchop Butte with hill climbs and variable terrain, but on a smaller scale.

Riders would have a developed staging area in Rivers and Junction area, but not at Walker. Rivers would have an additional semi-primitive staging area in Rivers and one semi-primitive in Walker.

This alternative has three analysis blocks out of 11 that have trail densities greater than four miles per square mile. These blocks are slightly denser than Alternative D.

**Alternative E**

Alternative E has the lowest amount of trail miles (142), but only slightly lower than Alternative B (143). But, since this alternative spreads the trail miles out more than some other alternatives, more subareas have designated trails and thus would have value to those wanting more variety. It would provide a total of 26 miles of trail for Jeeps/other 4-wheel drive vehicles in segments of 16 and 10 miles, rating at

moderate value for rider's experience. This alternative provides the highest amount of single track trail for motorcycles at 18 miles.

This alternative designates access to the two existing play areas in pits, Muttonchop Butte and Black Rock. This alternative has similar viewpoints as in Alternative A and C, except for access to road 100 on Walker Mountain. There are eight viewpoints that provide scenery, Walker 200RD, Little Odell Butte, Railroad Ridge, Muttonchop Butte, Royce Mountain 1, Royce Mountain 2, Royce Mountain 3, and Black Rock pit are the identified opportunities (See Table 7).

Alternative E has the identical staging opportunities as listed in Alternative D (See Table 6).

For rider's experience for solitude, this alternative is similar to Alternative D, although the densest blocks are in Little Odell, Sno-Park, and Powerline.

**Summary of Rider's Experience**

To some extent, it is difficult to summarize the factors involved in evaluating the rider experience to come up with the alternative(s) which would be preferred by riders. One reason is that there are some cross-purposes. For example, higher trail miles (often preferred by riders) usually results in a higher trail density which is less favored than trails with a lower density. Another factor is that riders are diverse. Motorcycle riders want the experience of trails that are 12-24 inches wide which is not compatible with quad riders who need trails at least 50 inches wide. This following table (Table 31) attempts to summarize the alternatives related to the rider's experience using factors such as number of trail miles by Class of vehicle, number of play areas, scenic viewpoints, staging opportunities, and trail density.

**Table 31. Alternatives and How They Meet Evaluation Criteria for an Adequate Rider's Experience (Key Issue #1)**

| Evaluation Factor | Best meets | Moderately meets | Least meets |
|---|---|---|---|
| Trail Miles | A | C, D | B, E |
| System layout (miles of Class II and III trails) | A, E | C | B, D |
| Play Areas | A, C, E | B, D | |
| Scenic Viewpoints | A, C, E | B | D |
| Staging Areas | B, C | D, E | A |
| Trail Density | A[28], B, C, E | D | |

In summary, Alternatives A, C and E appear to best meet the most factors for an adequate rider's experience. Alternative B and D would provide the least.

**Noise/Sound**

***Key Issue #3. How the Alternatives Respond to the Annoyance of Focused Motorized Use Adjacent to Residences***

The following attributes and measures would be used to compare alternatives:

1. Acres of private land with residences within 0.89 miles of a proposed OHV trail.
2. Acres of private land with residences within 0.89 miles of a proposed OHV trails or shared-use

[28] Although trail density is relatively high compared to action alternatives, the difference between designated versus unregulated trail systems does not allow an accurate comparison on this factor.

road on the designated trail system.
3. Miles of non-motorized trail within 0.89 miles of a proposed OHV trail.
4. Acres of Wilderness within 0.89 miles of a proposed OHV trail.

***Methodology, Assumptions and Background***

Since both research and on-the-ground sound testing in the project area indicate that sound dampens so that it cannot be heard by most people at approximately 0.89 miles from the source, the Forest Service can estimate the amount of land and miles of trail from which OHVs may be audible, both from residences, from within a Wilderness, and from a Wild and Scenic river corridor. A designated OHV trail system would consist of both concentrations of segments of OHV trails and connecting shared-use roads. It is likely that OHVs would spend more time on the trails (because trails are a preferable opportunity) and use the shared-used roads only to traverse to another trail area. It is acknowledged that OHVs are not the only audible sounds within private residences as there are mixed use roads that produce associated noise that would continue regardless of this decision.

The private land with residences was determined by looking at the Forest Service GIS layer of private land and using a visual scan of Google Earth to determine where residences and cabins occurred on private land. The acreage of those parcels with residences or cabins was then added together to come up with a total acreage of private land with residences.

Using GIS, the potential OHV trail system was buffered 0.89 miles from each OHV trail and shared-use road for each alternative. These maps were then overlaid with the private land with residences map to determine how many acres of private land were within 0.89 miles of a potential OHV trail or shared-use road by alternative. The intersection of these layers should be the area where OHVs can be heard.

As with residences, the potential OHV trail system was buffered 0.89 miles from each OHV trail and shared-use road for each alternative and overlaid with a map of designated wilderness and trails. Acreage of wilderness and miles of non-motorized trail within 0.89 miles of an OHV trail or shared-use road were then determined and are where OHVs could probably be heard.

For hunting, some hunters prefer to use OHVs and some not. For those who do not use them and prefer a quieter experience, the total number of designated OHV trail miles is an indicator of the effect by alternative.

No analysis measure was developed for the other locations or activities, but instead, alternatives are evaluated on empirical evidence.

Oregon State law and the Forest Service require that OHVs be no louder than 99 dB at 20 inches from the exhaust opening. With the current unregulated use, some untested individual OHVs currently using the Crescent Ranger District may be louder than 99 dB. If any of the action alternatives are selected, more effective monitoring and enforcement, overall sound levels may decrease over the existing condition (see Law Enforcement section in this Chapter). Monitoring and testing would be much more efficient as a designated trail system and identified staging areas allows law enforcement and volunteers an opportunity to test for compliance at key locations and times. Those tested and found to be over the 99 dB sound threshold, would not be able to participate.

The Three Trail OHV planning area contains approximately 3,520 acres of private land that has residences and cabins (excludes private timber lands and industrial land). Currently, nearly 90 percent of all the private land with residences or a cabin is within hearing range of an OHV route. This means that nearly all residents can probably hear OHVs when the OHVs are running.

In addition to OHV trails, some residences in the Two Rivers North subdivision are within hearing distance of the Muttonchop Butte Pit user-created play area. Riders use rock pits as a way to test their skills as riders use the varied terrain in an unrestricted manner. Comments from some residents have indicated they can hear the OHVs riding in the Muttonchop Butte pit and are annoyed by the sounds, especially at night.

A study of the potential impacts of aircraft overflights of wilderness areas found a majority of wilderness visitors were not annoyed by overflight sounds, a minority (16 percent) were somewhat annoyed, and a smaller minority (4 percent) were highly annoyed. This same study reported that the three most often mentioned reasons for visiting wilderness were experiencing peace and quiet (89 percent of respondents); viewing scenic vistas without hearing sounds of civilization (87 percent); and hearing the sounds of nature (81percent). Even though some visitors were annoyed, aircraft sounds did not appreciably impair these wilderness users overall enjoyment of their visits to the wilderness nor reduce their likelihood of repeat visits (Harrison et al. 1992).

It is likely, as with wilderness visitors, that some property owners would be annoyed by OHV sound and some would not. Some people purchase homes (primary residences or second homes) in rural areas where they expect peace and quiet. Others purchase land in these areas specifically so they have access to recreation, including OHV trails from their property. Cars, trucks, and other motorized equipment such as lawn mowers, weed eaters, and construction equipment often operate in subdivisions, so these areas already have some sounds.

Sound dissipates over distance. If the effects of terrain, vegetation, and wind are excluded, sound intensity decreases about 6 decibels (dB) per doubling of distance (Shilling 1993). A decibel level of 30 is characterized as somewhere between “quiet” and “very quiet” and equates to a quiet rural area (OMSI 2005). Assuming an OHV emitting a sound pressure of 99 dB at 20 inches from the exhaust opening (the highest that Oregon State law allows in this area), the sound would dampen to 30 dB at about 4,700 feet or 0.89 miles from the source (Sengpiel audio 2009) and would probably not be heard by the casual observer. Therefore, most people who are likely to be annoyed by the sounds of OHVs would not be annoyed at distances over 0.89 miles because they would probably not hear the sounds. When the effects of terrain, vegetation, wind, and higher background sounds are included, that distance can be shorter.

Even if an OHV cannot register on a sound meter, some people may still hear the sound and could be annoyed by it. A sound source such as an OHV can be clearly audible above the background, in some cases, even if its measured sound level is below that of the background (Harrison et al. 1993). This is especially evident if a person knows or thinks the sound is happening.

During the analysis for the Three Trails OHV project, district personnel performed sound testing on proposed OHV trails and at Muttonchop Butte Pit. The testing was designed to mimic actual on-the-ground conditions by using multiple Classes of vehicles (ATVs and motorcycles) and riders, selected locations of concern, typical summertime weather conditions and the time of day when most riders would be using the trails. Some observations and conclusions from the sound testing determined background sounds varied significantly with readings from 25 dB to 42 dB. Leaves rustling with the wind, chipmunks, crickets, footsteps, and human laughter all contributed to high background sound levels.

At one testing location, which was approximately 0.88 miles from operating OHVs, OHV sound was barely perceptible to observers and at times not perceptible. This would suggest that the 0.89 mile damping to a quiet rural sound stated in literature is appropriate for this location. More than one OHV did not necessarily increase the sound intensity, but it increased the duration of the sounds. When two OHVs went past a fixed observer approximately 180 feet away from the trail, it took approximately 45 seconds from the first perception of the sound to quiet again (USDA Forest Service 2009d).

***Wilderness and Trails***

Diamond Peak Wilderness lies west of Crescent Lake Junction and a portion of the wilderness is within the Three Trails OHV planning area, although no OHV route would be designated within the wilderness. Approximately two miles of the wilderness boundary lay 50-75 feet from the Union Pacific Railroad, which is where the shared portion of the Metolius-Windigo trail is located. Freight trains pass through the area periodically and are a source of sound to wilderness visitors.

None of the Mt. Thielsen Wilderness shares a boundary with the Three Trails OHV planning area and the closest point in this wilderness is approximately 1.5 miles from the Three Trails OHV planning area.

Motorized and mechanized uses are not allowed within designated wilderness, so most visitors to wildernesses expect quiet. But all wildernesses have transition zones where motorized sounds can be heard. In addition, motorized aircraft routinely fly over wilderness, so visitors most likely hear these sounds.

Two trails within the Diamond Peak Wilderness are near the boundary of the Three Trails OHV project area, are managed exclusively for non-motorized use, and their proximity is close to current OHV trails: Fawn Lake Trail and Pretty Lake Trail. Parts of these two trails are within hearing range (0.89 miles) of current OHV use on the two-mile portion of the Metolius-Windigo Trail west of Junction Sno-Park, which is an old road that equestrians, mountain bikers, and OHVs currently use. Approximately the same portions of these two Wilderness trails are also within audible range of the Union Pacific railroad tracks.

**Table 32. Wilderness Trails in Proximity to Proposed Designated Trails for Motorized Vehicles**

| Wilderness Trails | Total Trail miles |
|---|---|
| Fawn Lake Trail | 4.7 |
| Pretty Lake Trail | 1.8 |

There are no other exclusively non-motorized designated trails outside of Wilderness within the Three Trails OHV planning area except the Metolius-Windigo Equestrian Trail which is discussed below.

***Quiet Recreation***

Due to the Crescent Ranger District's proximity to a populated area, it is not visited as much as the Bend Ft. Rock or Sisters Ranger District for quiet recreation. Except for an approximate two-mile portion of shared use with other users (including motorized users), the Metolius-Windigo Equestrian Trail in this analysis is considered one of the "quiet recreation" pursuits on the Crescent Ranger District. It is a trail[29] that runs through the north end of the project area and utilizes the snowmobile underpass on Highway 58. This approximately 100-mile trail begins near the Metolius River headwaters west of Sisters and runs south to Windigo Pass near Crescent Lake. The trail was created around 1980 primarily to serve long-distance horse riders seeking an alternative to the Pacific Crest Trail. Because of its lower elevation, this trail is snow-free longer and has fewer mosquitoes than the higher elevation Pacific Crest Trail. The Deschutes National Forest trail opportunity guide recommends the trail for horses, hikers, and mountain bikers. The two-mile portion of the trail west of Junction Sno-Park is a former Maintenance Level 1 road that currently is shared by equestrians, mountain bikers and unauthorized OHV riders. From Road 60 to the Highway 58 snowmobile underpass, it is the only safe undercrossing to access some Crescent Lake

[29] District Personnel have observed the segment of the Metolius-Windigo trail that is shared receives very low use from equestrians

Junction businesses. This is an area where alternative routes are limited due to the Burlington-Northern railroad tracks adjacent to the Diamond Peak Wilderness, private land, and riparian conditions.
The Wild and Scenic rivers in the project area are Crescent Creek, Little Deschutes River, and Big Marsh Creek. The Little Deschutes River and Big Marsh Creek are popular hiking locations because of relatively easy access, scenery, remoteness, diversity of wildlife and vegetation in Big Marsh (the largest high elevation marsh in the United States) and access to water during the hot, dry months. Crescent Creek is also known for its mostly rugged terrain in the canyon and remoteness. All are popular fishing streams with most use between June and September.

Because of the diversity of habitats in one location and one of the few places where bird watchers can view a water thrush, the Crescent Creek campground is a popular area with a day-use site dedicated for birders hiking along the creek. The site is a stop listed on the Oregon Cascades Birding trail as part of the Crater Lake Loop. Organized trips to this sight occur periodically throughout the summer months. Also, Walker Mountain is a popular vista for viewing scenery and watching the hawk migration.

Other "quiet" pursuits include numerous hiking trails in OCRA which offer the same setting as the Diamond Peak Wilderness although motorized and mechanized equipment, such as bicycles, are allowed in the portion that does not overlap the Mt. Thielsen Wilderness. Discussion on OCRA is incorporated throughout this section. Also, at Odell Lake Resort a system of Nordic trails also serve as hiking trails in the summer. The proposed designated motorized routes do not overlap.

In the Three Trails OHV project area the designated trail system would be open to hikers, mountain bikers etc. if they chose. However, the primary goal of the designated trail system is to allow OHVs a place to recreate. Hikers or those seeking a more quiet form of recreation would be able to view the OHV designated trail system maps and the Motor Vehicle Use Map and plan their quiet recreation accordingly.

***Non-motorized winter recreation use***
Non-motorized winter recreation is sparse and generally consists of cross-country skiing on existing roads and locals snowshoeing from private property onto National Forest lands. This analysis focus is on summer OHV use and does not analyze in detail over-snow routes because of the absence of effects associated with the differing season of use.

**Direct and Indirect Effects for Sound from OHVs**
Table 33 displays the acres and percent of private land with residences where sounds may be heard when OHVs are riding on the designated OHV trail system by alternative. These acres are within 0.89 miles of OHV trails and shared-use roads. Beyond the 0.89 miles, it is unlikely that people could hear OHVs, although there is a total of 3,519 acres of private land adjacent and within the project area.

**Table 33. Acres and Percent of Private Land with Residences from which Sounds of OHVs Might be Audible**

| | Alt A | Alt B | Alt C | Alt D | Alt E |
|---|---|---|---|---|---|
| Acres and percent of private land with residences within 0.89 miles of a user-created or proposed OHV trail | 1129<br>32% | 728<br>21% | 2111<br>60% | 1329<br>38% | 1899<br>54% |
| Acres and percent of private land with residences within 0.89 miles of a trail or shared-use road designated in trail system | 3145<br>89% | 2041<br>60% | 2933<br>83% | 2172<br>62% | 2784<br>79% |

Because this analysis evaluates the effects to private lands as a whole, the effects to individual residences

or cabins may be different than expressed here. Muttonchop Butte Pit play area remains open in all alternatives except Alternative D. However, the action alternatives were designed with the minimum necessary routes to disperse riders from private residences. Many redundant and unnecessary trails were proposed to be closed and rehabilitated. This was also the design feature used for Muttonchop Butte Pit play area, as well as a Project Design Feature that defines the play area and maintains the current vegetation. Both of these features have the effect of potentially quieting the noise associated with the pit.

**Alternative A**

Currently, close to 90 percent of all private lands are within 0.89 miles of either a currently-used trail or shared-use road used by OHVs. This means that nearly all residences are potentially within hearing distance of an OHV. Because OHV riders use roads extensively in Alternative A, only 32 percent of the private lands are within 0.89 miles of a trail.

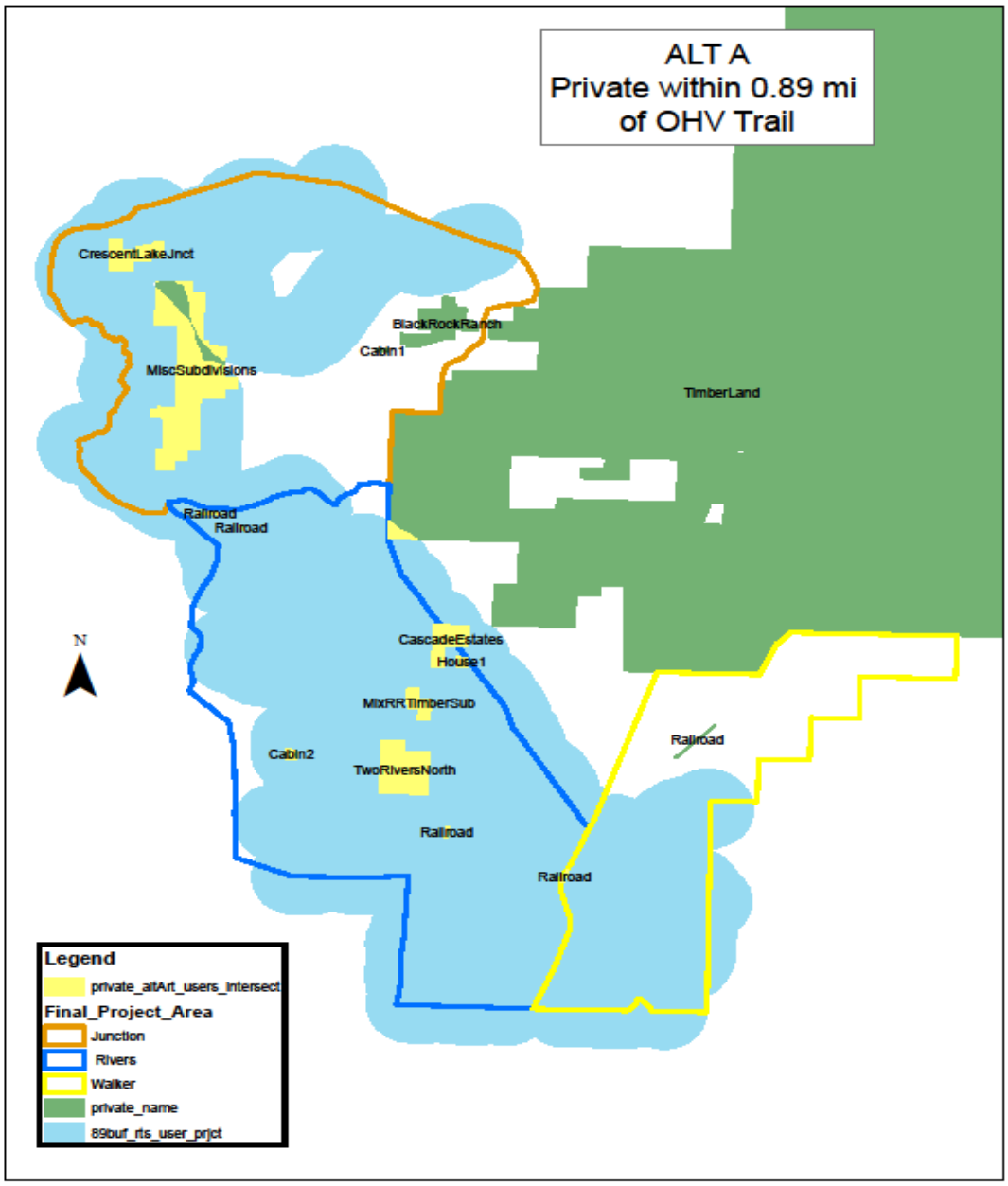


**Figure 14. Proximity of Designated Roads and Trails to Private Residences for Alternative A**

**Alternative B**

This alternative would potentially affect the least amount of residents on private land. Sixty percent of private lands are within 0.89 miles of an OHV trail or shared-use road. Only 21 percent of private lands are within 0.89 miles of an OHV trail. In this alternative as in Alternative D, Black Rock Pit play area, which is adjacent to Black Rock Ranch and a cabin, is not designated as part of the trail system.

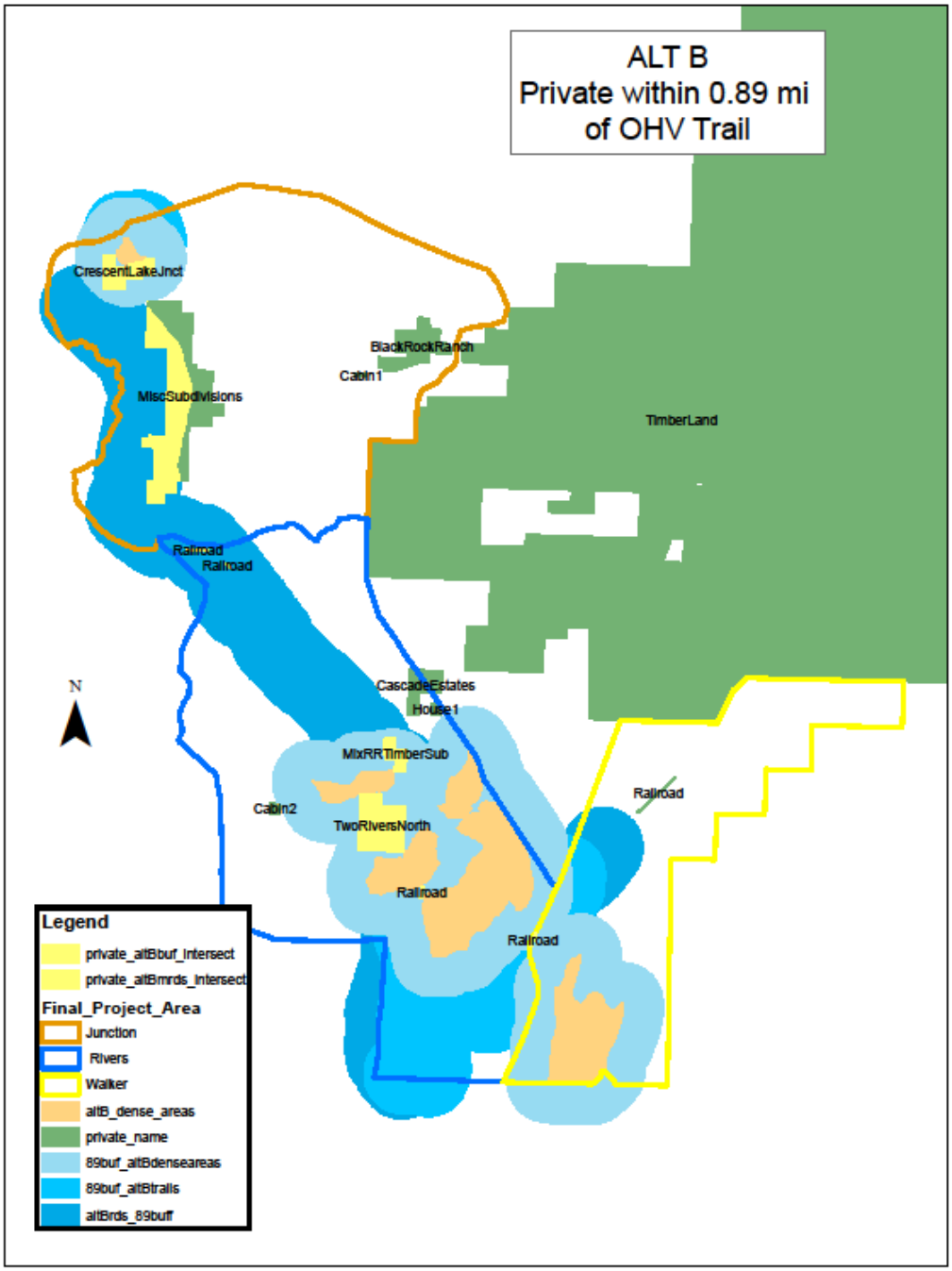


**Figure 15. Proximity of Designated Roads and Trails to Private Residences for Alternative B**

**Alternative C**

Of the action alternatives, Alternative C would affect the most acres as approximately 83 percent of the private lands are within 0.89 miles of a trail or shared-use road, but only 60 percent of the private lands are within 0.89 miles of a trail. In this alternative, both Muttonchop Butte Pit and Black Rock Pit (which are adjacent to cabins and residences) are included in the trail system.

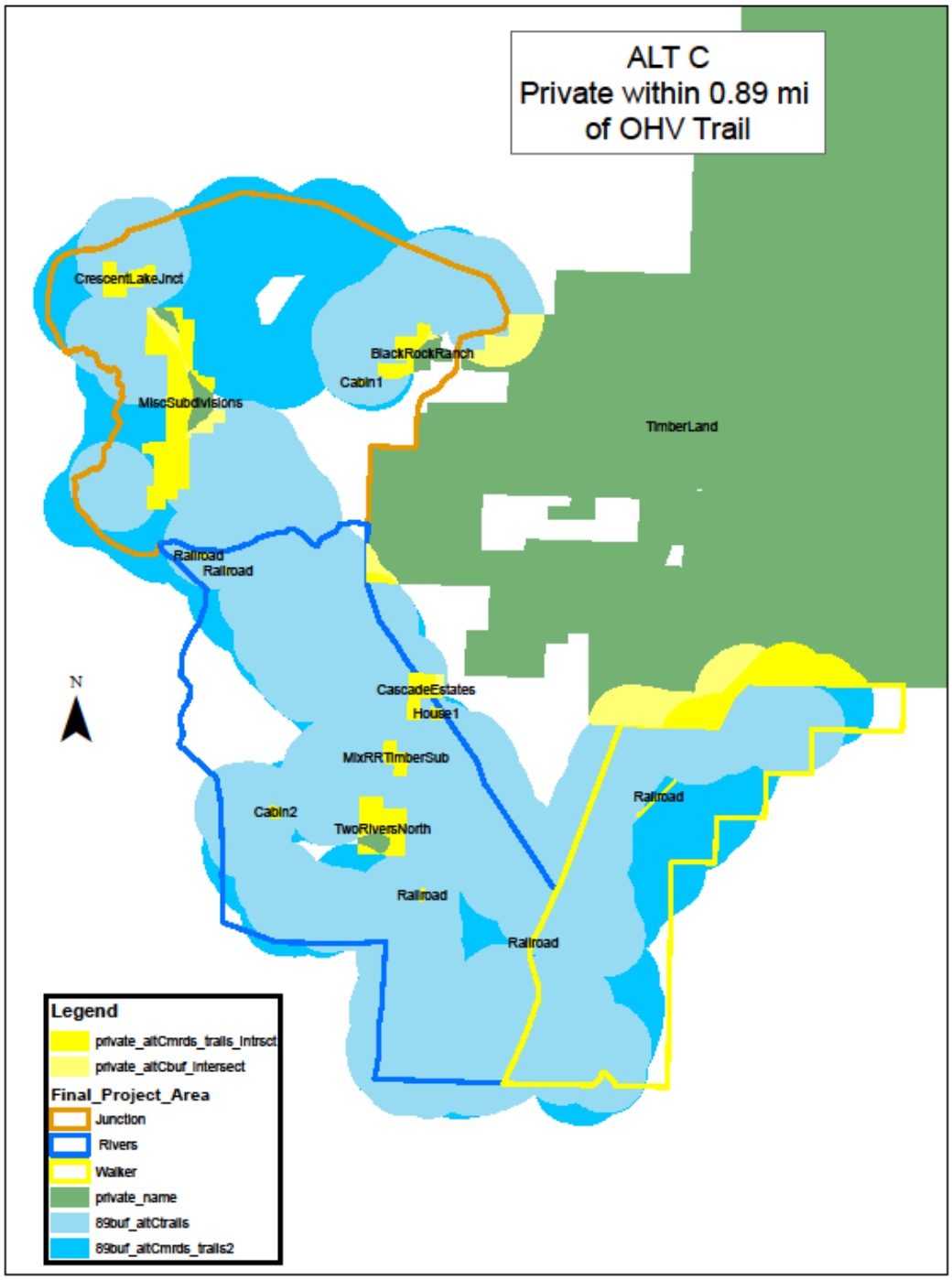


**Figure 16. Proximity of Designated Roads and Trails to Private Residences for Alternative C**

**Alternative D**

Alternative D was the alternative that was designed to be most responsive to Key Issue #3 (noise). This alternative closes Muttonchop Butte pit and replaces it with Quarry Pit #2011. Also, Black Rock pit is not included in the trail system. It also moves the closest trail away from the Cascade Estates subdivision. Overall, 62 percent of private lands are within 0.89 miles of a trail or shared-use road, which is potentially the most silent alternative for residence exposure to OHV noise. It also is one of the overall quietest with 38 percent within 0.89 miles of a trail.

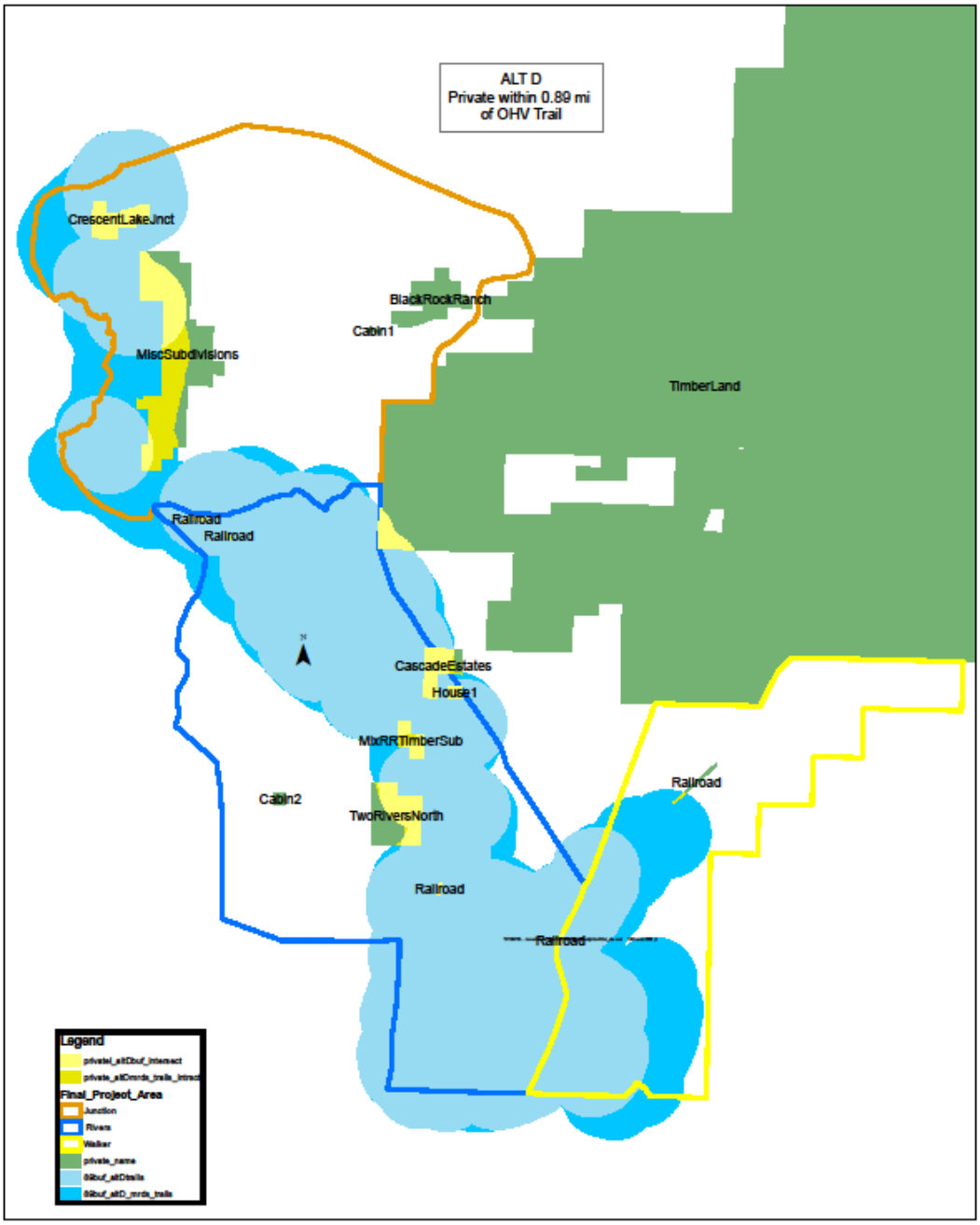


**Figure 17. Proximity of Designated Roads and Trails to Private Residences for Alternative D**

**Alternative E**

Alternative E is the mid-range of these alternatives for effects from sounds of OHVs with 79 percent of the private lands within 0.89 miles of a trail or shared-use road and 54 percent of the private lands are within 0.89 miles of a proposed trail. In this alternative Muttonchop Butte and Black Rock Pit play areas are open and designed into the system.

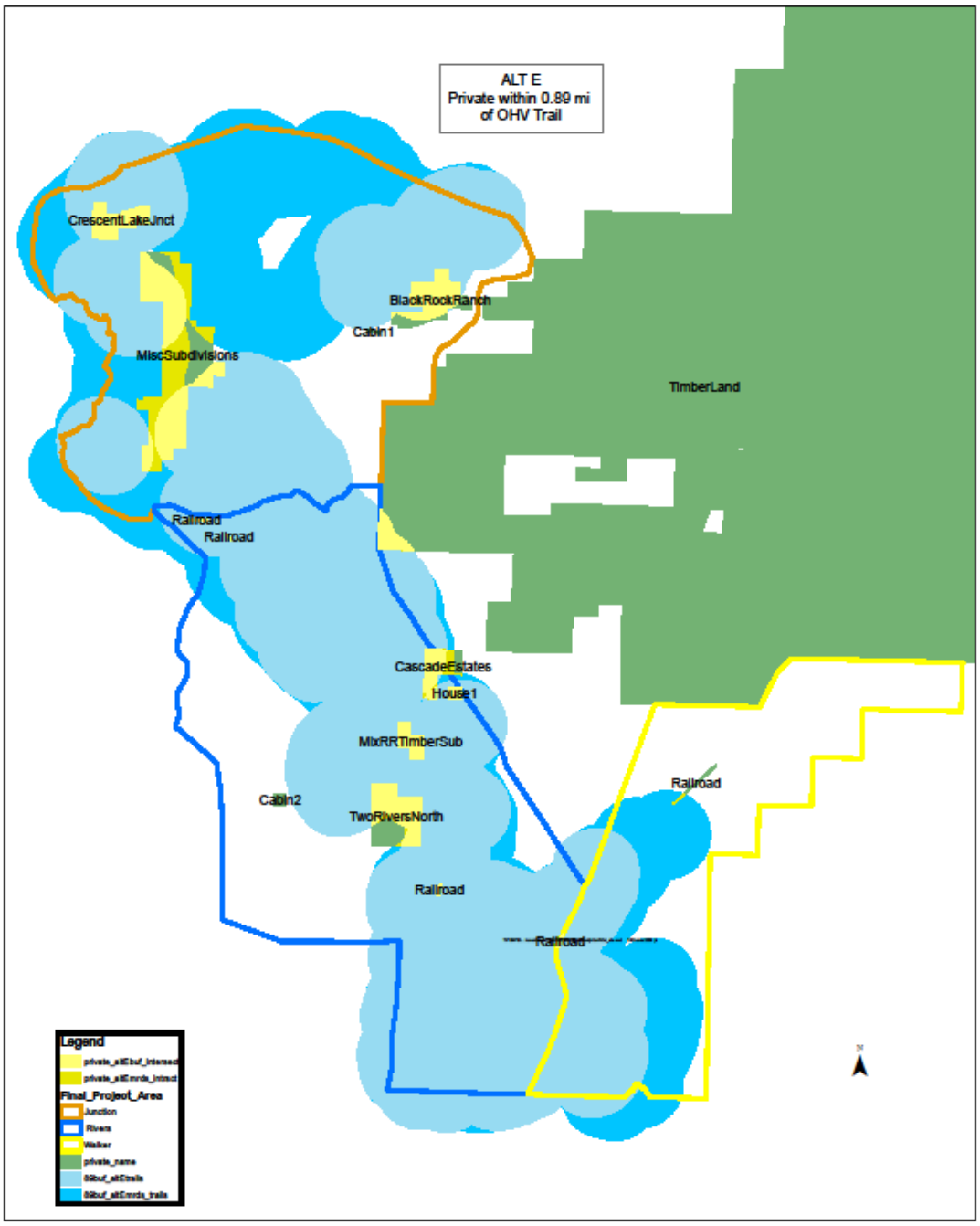


**Figure 18. Proximity of Designated Roads and Trails to Private Residences for Alternative E**

## Adjacent Unroaded Characteristics and Values

***Wilderness and Inventoried Roadless Areas***
Portions of two wilderness areas along the Cascade Mountain crest are within the Crescent Ranger District: Mt. Thielsen Wilderness, and Diamond Peak Wilderness. A portion of the Mt. Thielsen Wilderness is both OCRA and Wilderness, but is managed in accordance with the Wilderness Act and Wilderness Standards and Guidelines (M14-7). Motorized and mechanized use is prohibited by law in all wilderness areas. The nearest Inventoried Roadless Area (IRA) is Maiden Peak which is over four miles to the north of the nearest activity associated with the project area. Due to its proximity and the lack of potential effects associated with this project, it would not be further evaluated in this document. Table 34 displays the number of acres of each Wilderness area.

Diamond Peak Wilderness lies west of Crescent Lake Junction and a portion of the wilderness is within the Three Trails OHV planning area. OHVs currently use a two mile portion of the Metolius-Windigo Trail approximately 0.01 miles from the Diamond Peak Wilderness boundary. The Union Pacific railroad follows the boundary between the wilderness and this trail.

None of the Mt. Thielsen Wilderness is within or shares a boundary with the Three Trails OHV planning area and the closest point to the planning area is approximately 1.5 miles.

Both the Diamond Peak and Mt. Thielsen Wilderness boundaries are also well roaded along the boundary shared with the Winema National Forest, and at Crescent Lake. There are no designated OHV trails within Diamond Peak or Mt. Thielsen Wildernesses.

**Table 34. Land Area in the Two Wilderness Areas that are Partially on the Crescent Ranger District, Deschutes National Forest**

| Wilderness | Total Acres | Crescent Ranger District Acres |
|---|---|---|
| Mt. Thielsen | 61,281 | 6,400 |
| Diamond Peak | 54,185 | 32,964 |
| Total | 115,466 | 39,364 |

Using the threshold for audible sound at 0.89 miles, it is assumed this would be the boundary for effects associated with noise from motorized vehicles. Other effects disclosed are generally limited to the site-specific discussions.

***Oregon Cascades Recreation Area (OCRA)***
The OCRA boundary is well roaded along its perimeter and a few roads provide access into its interior. It has approximately 50 miles of Maintenance Level 2 road within the boundary itself and closer than 0.89 miles along the perimeter. It also contains about four miles of Maintenance Level 1 road at this distance. It is managed with the recreation opportunity spectrum (ROS) for Semi-Primitive Motorized (M14-6). Applicable Forest Plan Standards and Guidelines include:

M14-1 Recreation/Vehicle Use – Local and low standard roads needed to support winter recreation activities and vegetation management would be located to serve as winter travel routes. Some roads may be closed for resource protection.

***Unroaded Values***
The following values often characterize unroaded values (Federal Register, January 12, 2001):

- High quality soil, water, and air.
- Sources of public drinking water: the Three Trails OHV Project area is not a source of public drinking water.
- Diversity of plant and animal communities.
- Habitat for threatened, endangered, proposed, candidate, and sensitive species, and for those species dependent on large, undisturbed areas of land.
- Primitive, Semi-Primitive Non-Motorized, and Semi-Primitive Motorized classes of recreation opportunities.
- Reference landscapes: The three main segments of the trail system are located in a large landscape of similar characteristics of lodgepole flats, plant associates, and soils.
- Landscape character and scenic integrity.
- Traditional cultural properties and sacred sites.
- Other locally identified unique characteristics.

Incursions of unauthorized motorized travel into the Wilderness areas are an occasional occurrence, particularly on the Fawn Lake Trail in the Diamond Peak Wilderness. In the Oregon Cascade Recreation Area (OCRA) occasional motorized travel is at the Oldenburg Trailhead and Cow Camp.

**Direct and Indirect Effects**
**Alternative A**
Under Alternative A, characteristics that are used to define unroaded values such as high quality soil and water, and recreational opportunities would remain at current levels. Opportunity to hear and see motorized vehicles would not change. Due to the basic unregulated nature of travel and the expanse of the riding area, law enforcement for incursions of motorized vehicles into unroaded areas would remain problematic. Implementation of the Travel Management Rule would generally limit motorized travel to Maintenance Level 2 roads.

**Action Alternatives**
Because all of the Mt Thielsen Wilderness is approximately 1.5 miles (more than 0.89 miles) from the planning area, it is unlikely that sounds of OHVs could be heard in that wilderness.

For the Diamond Peak Wilderness and OCRA, opportunity to hear and see motorized vehicles would not appreciably change from the current condition. Implementation of action alternatives would encourage motorized travel on designated routes, which are generally located away from any OCRA or Wilderness boundaries where sounds would be detectable. By designation of routes, monitoring and enforcement of incursions into unroaded areas would likely be more efficient because of more defined areas where riders can and cannot be and more focused patrols.

On the portion of the designated trail system along the railroad tracks at Crescent Lake, where route designation is adjacent to the Diamond Peak Wilderness area, sights or sounds within the Wilderness boundaries would have potential for a longer duration noise as more than one rider uses the trail[30]. In addition to several freight trains a day, lack of proximity to a wilderness trailhead and the existing relatively low use in the wilderness, visitors and the values associated with unroaded characteristics

[30] Increase in riders is forecasted to be 2.5-5.6 percent per year.

would not appreciably change from the existing condition. The area of overlap of potential noise into the 52,337-acre wilderness area is approximately 3 percent. Visitor's current feelings of seclusion, remoteness, and solitude would remain. Associated dust during the busiest time of the season would be localized and would not be expected to be detectable at the Fawn Lake Trailhead, which is the closest to a designated motorized trail. Effects to the Odell Lake Resort trail system would be very similar.
The potential for sound of OHVs in the Diamond Peak Wilderness would be the same in all action alternatives because they would designate the trail southwest of Crescent Lake Junction and east of the railroad track. The trail is currently experiencing unauthorized use from OHVs and authorized use from mountain bikers and equestrians as part of the Metolius-Windigo National Recreation Trail. Portions of two trails, Fawn Lake Trail and Pretty Lake Trail, within the Diamond Peak Wilderness are within 0.89 miles of this proposed OHV trail: Hikers on these two trails could potentially hear OHVs along two miles of the Fawn Lake Trail and one half mile of the Pretty Lake Trail (Table 35 and Figure 19), plus the sound of passing freight trains on the railroad tracks. These trails receive relatively low use compared to other wilderness trails on the forest[31].

**Table 35. Miles of Wilderness Trail and Acres of Wilderness within 0.89 miles of a Proposed OHV Trail**

| Diamond Peak Wilderness | | All Alternatives |
|---|---|---|
| Miles of wilderness trail within 0.89 miles of a proposed OHV trail | Fawn Lake Trail | 2 |
| | Pretty Lake Trail | 0.5 |
| Acres of Wilderness within 0.89 miles of a proposed OHV trail | | 1561 |

[31] Conversation with Mark Christiansen, Recreation Team Leader for the Deschutes National Forest 2010.

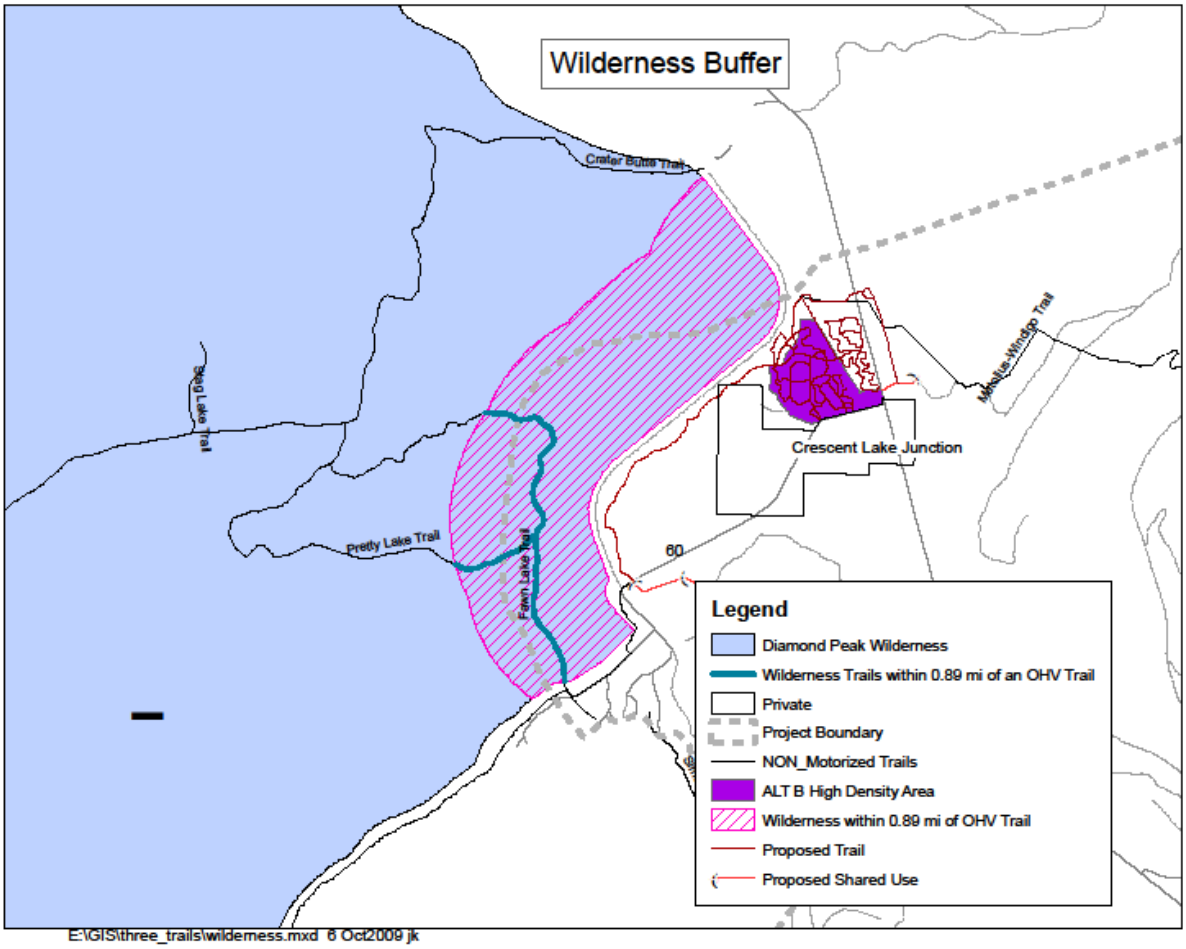


**Figure 19. Wilderness Lands and Trails within 0.89 Miles of an OHV Trail**

For all alternatives, there would be no effect and no change to the 72 recreational residences under special use permit along Crescent Lake. In addition to the sights and sounds of Road 60, recreational boating and activity associated with Crescent Lake, and the Northern-Pacific railway, OHV travel on the designated routes would be undetectable and fugitive dust would be very localized to the trail itself.

### How the Action Alternatives Respond to Identified Unroaded Values

***High quality soil, water and air:*** *There would be no effect on unroaded values identified in this analysis and they would continue to be provided.* Impacts to the soil resource are limited to the area of activity and are described in the Soils section in this Chapter. Soil productivity is maintained through Project Design Features and rehabilitation on user-created trails in inappropriate areas, as well as a net reduction in road density in many subwatersheds. Project Design Features were also designed to minimize sediment potential and it has been determined that there would be a net maintenance and restorative process overall by meeting the Aquatic Conservation Strategy objectives on a site specific and a watershed scale. Many user-created trails within riparian areas would be closed and moved away from water (Aquatic Resources, this Chapter). Air quality is also addressed in this chapter. Any localized impairment would be diluted to a scale that would be impractical to measure. A projected 2.5 to 5.6 percent early increase in riders would not change this condition.

In summary, there would be no measureable effect to air quality since the net emissions from vehicles, vehicle travel, forest management activities, and wildfires are unlikely to appreciably change under the action alternatives. There may be some temporary air quality impairment from localized vehicle emissions and fugitive dust, but it would be well away from OCRA, Wilderness, and Inventoried Roadless Areas.

***Diversity of plant and animal communities:*** The diversity of plant and animal communities are not unique for the area. Effects to wildlife and botany are disclosed in Chapter 3 and in summary the effects are limited in scale to the designated trail system itself.

***Habitat for threatened, endangered, proposed, candidate, and sensitive species, and for those species dependent on large, undisturbed areas of land***: Effects to the Pacific fisher, wolverine and other species dependent upon large, undisturbed areas of land are disclosed in the Threatened, Endangered, and Sensitive Wildlife section in Chapter 3.

***Primitive, Semi-Primitive Non-Motorized, and Semi-Primitive Motorized classes of recreation opportunities:*** The Three Trails OHV project does not change the Recreational Opportunity Spectrum (ROS) for these areas. The project area designates where motorized uses can occur within the project area and adjacent to the Diamond Peak Wilderness and OCRA, however non-motorized opportunities would continue to operate unchanged from the current condition. The analysis also discloses potential for audible sounds from motorized recreation in these areas. For the action alternatives, the nearest designated OHV trail to the OCRA is one mile and therefore not likely to experience sounds from an engine. However, Alternative C uses road 5830 as a shared route, which at its closest point to the OCRA boundary, is within 0.75 miles. Using the threshold for audible sound at 0.89 miles, potentially 0.14 miles into the OCRA would hear the sounds of traffic on the road. Fugitive dust which is typically localized would not be apparent except for those Maintenance Level 2 roads that would remain open.

***Roaded Natural Category of Recreation Opportunity Spectrum:*** The Forest Plan identifies the area near Crescent Lake Junction as Management Area 11 (M11-1) "Roaded Natural." A portion of this overlays the Three Trails OHV project where a Forest Plan Amendment is being considered. Appendix 2 (D LRMP) explains "Roaded Natural" as "area is characterized by predominately natural-appearing environment with moderate evidence of sights and sounds of humans. Interaction among users may be low to moderate, but with evidence of other users prevalent." It is currently being shared as a travel corridor by Highway 58, railroads tracks, and an airport landing strip. That level of interaction is not expected to change even with an expected increase in visitation of 2.5 to 5.6 percent over the next decade. Although "conventional motorized use is provided for in construction standards and design of facilities," there are no facilities being constructed.

***Landscape character and scenic integrity:*** The landscape character would be similar following trail construction. Disturbance associated with unregulated motorized use has already occurred; closure and rehabilitation of unneeded trails in inappropriate areas that are valued for riparian, cultural, or wildlife habitat would more than offset new trail construction and route designation. Trails would essentially be designed to not dominate the landscape; thus maintaining the current scenery and landscape character. For more information, reference the Scenic Quality and Wild and Scenic section in Chapter 3.

***Traditional cultural properties and sacred sites:*** There are no effects to known traditional cultural resources or sacred sites in OCRA or Wilderness areas, including potential linkage from a historic trail from the project area. Appropriate consultation with affected parties has occurred (Cultural Resources, Chapter 3).

***Potential wilderness consistency***

Forest Service Handbook 1909.12 Chapter 70 section 71.1 outlines the criteria to be applied to meet the statutory definition of wilderness. Essentially, these criteria are limited to size requirements and presence of roads; however the Forest Service also looked at trail construction for (2.a) areas that can be preserved due to physical terrain and natural conditions, (2.b) Areas that are self-contained ecosystems, such as an island, and (2.c) Areas that are contiguous to existing wilderness, primitive areas, or potential wilderness in other Federal ownership, regardless of size.

Criteria 1: Alternative C would construct 0.89 miles of trail adjacent to approximately 5,000 acres of relatively steep Walker Rim which is bisected by a few roads. The trail construction would link existing open Maintenance Level 2 roads along the same elevation to form a route along the rim. This area has experienced numerous entries for active forest management; including the Blade Timber Sale in the 1990s. Trail construction would be 50 inches wide and there would be no construction of roads.

There are no other areas with potential to meet or exceed the acreage threshold of 5,000.

Because of active forest management surrounding the area, a well-roaded portion below the rim and the lack of potential to manage the portion as a separate island of a self-contained ecosystem, trail construction activities do not occur in areas that qualify as potential wilderness according to FSH 1909.12 Wilderness Evaluation. Also, as the project is designed, it does not preclude the steep and unroaded section of the rim from potentially being considered for potential wilderness in the future.

Criteria 2a and 2b: Black Rock is the only new trail construction that would occur in or adjacent to areas that have potential to meet these criteria. Alternative C and E would construct approximately four and two miles of trail (respectively) around the edge of Black Rock lava flow to take advantage of existing user-created roads and trails that link with an existing road system and the mineral extraction pit. There are no existing roads or trails within the relatively undisturbed 700-acre interior of the lava flow. Trail construction would be 50 inches wide or greater, there also would be no construction of roads, and active forest management utilizing timber sales are apparent up to the edge of the flow.

Because of active forest management up to the lava flow and a well roaded surrounding system of roads plus the lack of potential to manage the portion as a separate island of a self-contained ecosystem, trail construction activities do not occur in areas that qualify as potential wilderness according to FSH 1909.12 Wilderness Evaluation. Also, as the project is designed, it does not preclude the lava feature from potentially being considered for potential wilderness in the future.

All other portions of the Three Trails OHV project cannot be preserved due to physical terrain and natural conditions (subpart a), are not a self contained ecosystem (subpart b), and are not contiguous to existing wilderness, primitive areas, administratively endorsed wilderness, potential wilderness in other federal ownership (subpart c). See the Recreation section in Chapter 3 for more details. Essentially, all routes are well separated by improvements specified in 17.11 (including a railroad) from the Diamond Peak and Mt. Thielson Wildernesses and Oregon Cascades Recreation Area. Also, the trail system overlaps lands that have been actively managed by timber sales since the 1960s and 1970s. The closest Inventoried Roadless Area, Maiden Peak, is several miles away.

**Quiet Recreation**

Opportunities for quiet recreation can be found in the adjacent wilderness areas, OCRA, the remaining portion of the Metolius-Windigo Trail that is not shared with motorized users, and within Wild and Scenic River corridors – especially in the portion of Crescent Creek between Highway 58 and Crescent Creek Campground. At Crescent Creek Campground which is a popular birding destination, only Alternative C utilizes it for a staging area. Otherwise, it would remain a relatively quiet experience

except for the nearby traffic associated with County Road 61 (Crescent cut-off).

Some responders to the public outreach for this project commented that they were concerned designated trails could affect their quiet recreation experience. All action alternatives limit motorized vehicles to designated routes without conflict with non-motorized trails. This would enable visitors to choose a recreation setting away from sights and sounds from riders and have a greater assurance they would have the experience they desire.

## Metolius-Windigo Equestrian Trail

**Key Issue #4*: There may be incompatibility where the designated trail system overlaps the Metolius/Windigo Horse Trail system.***

The following measure would be used to compare alternatives given the limited options for all users (equestrians, mountain bikers, pedestrians, and motorized users) to access Crescent Lake businesses and safely cross under Highway 58:

- Miles of Metolius-Windigo horse trail that overlap designated OHV trail

**Alternatives A and B**
These alternatives would maintain the status-quo and retain current trail on the two-mile section west of Junction Sno-Park. Under Alternative A the current OHV use of the trail is unauthorized. With equestrians and OHV riders on the same trail for entire two miles, the potential to surprise and startle horses would be the greatest of the alternatives. It also would be the least consistent with the Forest Plan objective to move the trail off of roads and eliminate shared use with motorized users (LRMP, TR-36, page 4-34).

**Alternatives C, D, and E**
These alternatives would separate users of the two-mile stretch of the shared trail wherever possible except in the wet areas (riparian reserves/RHCA) by paralleling wherever possible. Equestrians, hikers, mountain bikers, and motorized users would continue to share portions of trail due to limited options caused by terrain, land ownership, and proper riparian function of the wet areas. Signing would be used to encourage respectful behavior by all users.

Sights and sounds of motorized users would remain evident to equestrians in these three alternatives; however the potential for causing unexpected behavior that places horse riders and animals at risk is greatly reduced. It also aligns with the objective for moving the horse trail off roads and eliminating shared use with motorized users (LRMP, TR-36, page 4-34).

**Wild and Scenic Rivers**
Three rivers on the Crescent Ranger District and within the Three Trails OHV planning area are part of the National Wild and Scenic Rivers System. They are Big Marsh Creek, Crescent Creek, and the Little Deschutes River, comprising 37 river miles (Table 36). Big Marsh and the Little Deschutes have Wild and Scenic River Comprehensive Management Plans while Crescent Creek is currently in a public process to implement a plan and identify boundaries. It currently is guided by interim direction provided by the Deschutes National Forest Plan. The Deschutes National Forest Plan was amended to include the Big Marsh and Little Deschutes Management Wild and Scenic Plans.

The 1968 Wild and Scenic Rivers Act calls for maintaining the free-flowing character of designated rivers, protecting the water quality, and protecting and enhancing their "outstandingly remarkable values." Outstandingly remarkable values (ORVs) 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.

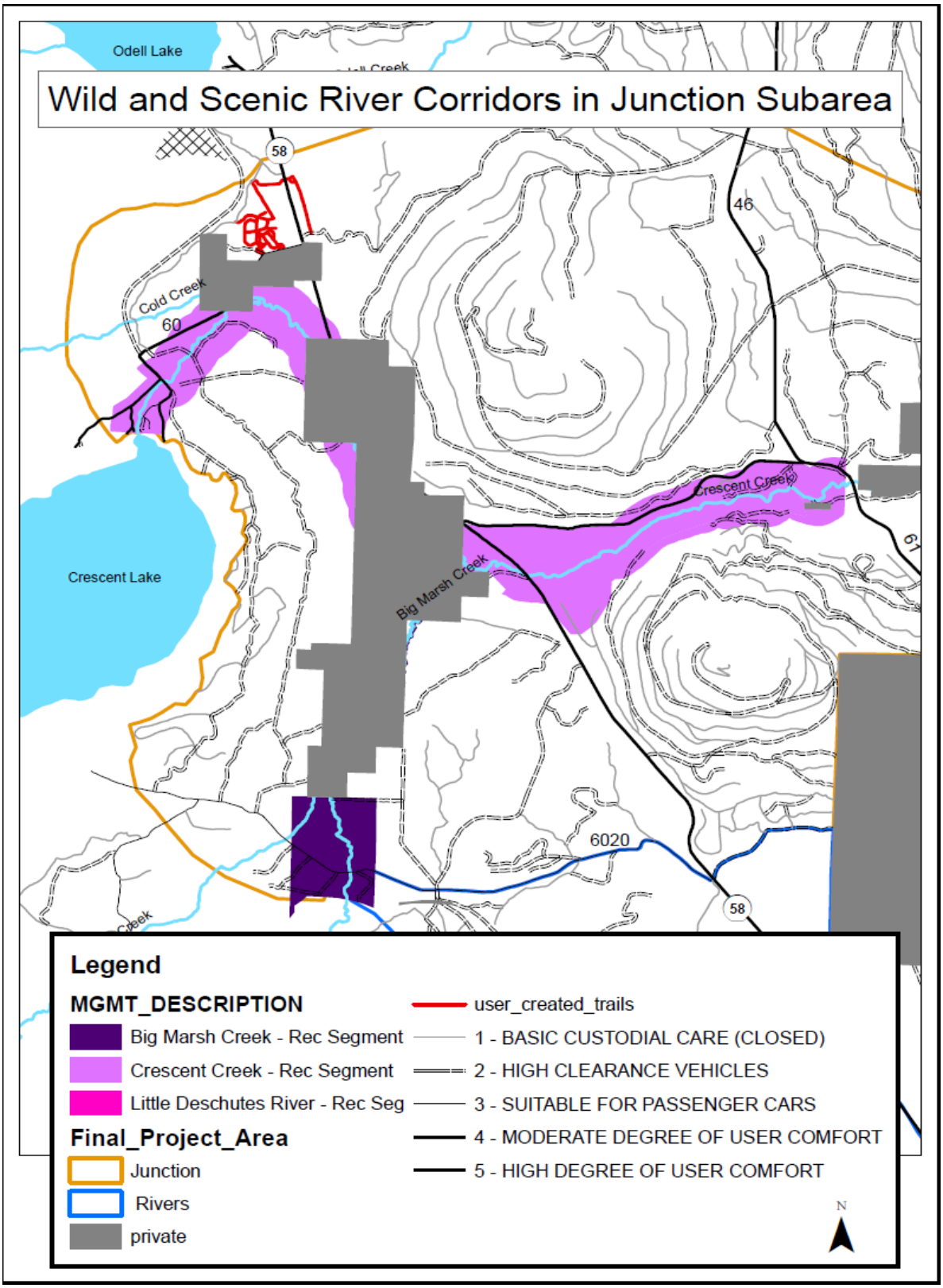


**Figure 20. Existing Roads, User-created Trails and Wild and Scenic River Corridors in the Junction Subarea of the Three Trails OHV Project Area**

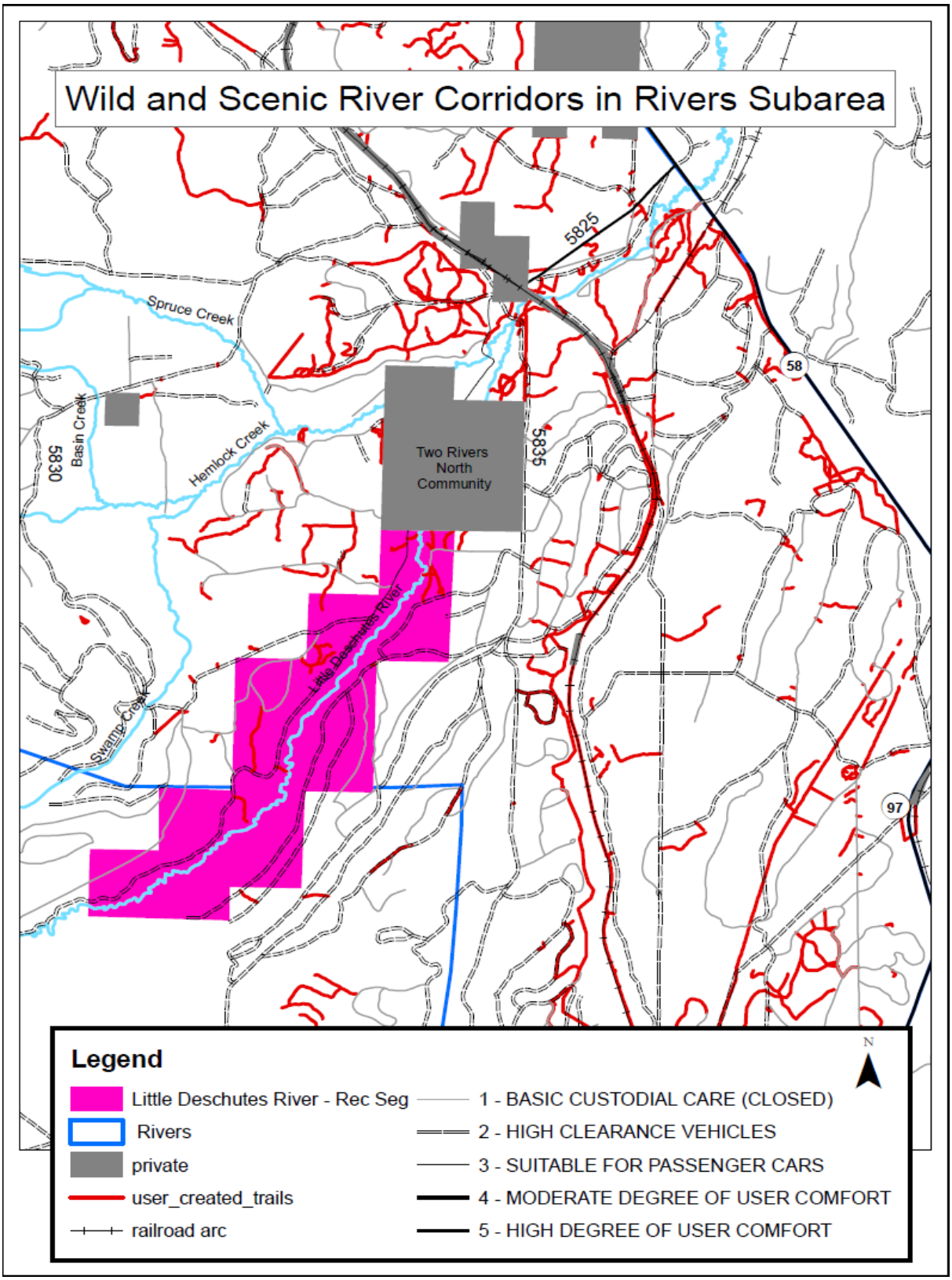


**Figure 21. Existing Roads, User-created Trails, and Wild and Scenic River Corridors in the Rivers Subarea of Three Trails OHV Project Area**

Figure 20 and Figure 21 show the locations of the existing user-created trails in the Junction and Rivers subareas that intersect with the Wild and Scenic River corridors for all action alternatives on Federal lands in the project area. Walker subarea has no designated Wild and Scenic River corridors.

**Table 36. Wild and Scenic Rivers within the Three Trails OHV Planning Area**

| River Name | Designated Miles | Classification | Outstandingly Remarkable Values |
|---|---|---|---|
| Big Marsh Creek | 15 | Recreational | Scenery/Vegetation, Geology, and Wildlife |
| Crescent Creek | 10 | Recreational | Scenery/Vegetation, and Wildlife[32] |
| Little Deschutes River | 12 | Recreational | Scenery/Vegetation, Geology |

**Free-flow condition**

All three rivers are free-flowing and have no impediments to flow. Currently, roads exist in all three Wild and Scenic River (WSR) corridors. OHV use and user-created OHV trails is most predominate within the Little Deschutes River WSR corridor. Until the Travel Management Rule is implemented through the Travel Management FEIS (likely in 2011), some trails lead to the river and in some cases, cross stream banks and the river causing concerns for water quality degradation. Dispersed camping is also most prevalent along this river, contributing to potential stream bank instability. Both user-created trails and dispersed camping are causing undesired conditions, but they likely are not affecting the 303(d) parameters for which the Little Deschutes River is impaired for temperature and dissolved oxygen. A more thorough discussion is in the aquatic resources section. Crescent Creek, throughout its length is listed on the 303(d) list as "Water Quality Limited" by the Oregon Department of Environmental Quality for temperatures exceeding State guidelines. This is mainly due to impoundment and flows released from the dam. Water quality standards cannot be met without restoring streamflows. Due to the remote nature of a considerable segment of Crescent Creek, there are very few user-created trails or dispersed camps that have potential to affect these parameters.

**Outstandingly Remarkable Values**

Table 36 displays the Outstandingly Remarkable Values identified for the three Wild and Scenic Rivers within the planning area.

**Classification**

Classification for a Wild and Scenic River designation consists of; Wild, Scenic, or Recreational. The three Wild and Scenic Rivers segments in the Three Trails OHV planning area (Table 36 and Figure 20 and Figure 21) have been classified as Recreational which means "those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines and may have undergone some impoundment or diversion in the past." Motorized trails are consistent with Wild and Scenic recreational Rivers as long as they are designed to protect the Outstanding Remarkable Values (ORVs).

The alternatives were evaluated by evaluating the miles of OHV route within Wild and Scenic River (WSR) corridors (Table 37and Figure 20 and Figure 21). Notice the net reduction of roads and trail miles in Alternative B, C, D, and E as compared to Alternative A in Table 37.

[32] Although a final management plan is pending, these ORVs have been tentatively identified

**Table 37. Miles of OHV Routes within Wild and Scenic River Corridors**

| River Name | ALTERNATIVE A | | ALTERNATIVE B | | ALTERNATIVE C | | ALTERNATIVES D & E | |
|---|---|---|---|---|---|---|---|---|
| | Road Miles | Trail Miles** | Road Miles | Trail Miles** | Road Miles | Trail Miles** | Road Miles | Trail Miles** |
| Big Marsh Creek | 2.5 | 0.0 | 2.5 | 0.0 | 1.3 | 0.0 | 1.3 | 0.0 |
| Crescent Creek * | 9.3 | 0.0 | 7.6 | 0.0 | 7.0 | 0.2 | 7.0 | 0.0 |
| Little Deschutes River | 9.5 | 2.7 | 6.7 | 0.0 | 4.2 | 1.9 | 4.2 | 0.0 |

* Crescent Creek WSR corridor boundary is subject to change with the Comprehensive River Management Plan currently being written.
**Trail miles include trails and roads that would be made into trails

## Direct and Indirect Effects

### Free-Flow condition

No alternative would affect the free-flowing condition of any Wild and Scenic River segment, therefore a Section 7A analysis is not required.

Alternative C is the only action alternative that proposes to build a bridge over the Little Deschutes Wild and Scenic River. Currently, the river is being forged by OHVs on user-created trails. The proposed bridge would not occur within the bed and banks of the river, but would span the river. Therefore, building this bridge would not disturb the free-flowing condition of the river.

### Water Quality

In summary, all action alternatives improve Aquatic Resources by using Project Design Features to reduce potential for sedimentation and none of them would change the parameters for which each river is listed for water impairment in the Clean Water Act. There are no standards/criteria for water quality listed for a Recreational river classification under the Wild and Scenic River Act. For a more thorough discussion, reference the water quality section in this chapter.

Table 37 displays all action alternatives would have fewer road miles within WSR corridors than in Alternative A. Alternatives B, D, and E would not designate OHV trails within Wild and Scenic River corridors. None of the action alternatives is likely to adversely affect the water quality of these Wild and Scenic rivers. Alternative C would designate 0.2 miles of OHV trail within Crescent Creek corridor approximately 1/8 of a mile from the creek. It also would propose an OHV trail that would cross the Little Deschutes River. The trail design and bridge would connect 1.9 miles of designated OHV route, lead to the Little Deschutes River, and over the proposed bridge.

### Consistency with Outstandingly Remarkable Values (ORVs) and the Wild and Scenic Comprehensive River Plan

***Big Marsh Creek***

The uniqueness of the ORVs for Big Marsh Creek is mainly associated with the marsh itself upstream and the Three Trails OHV project boundary is outside the zone of influence to affect those values. However, the action alternatives would close inappropriate user-created trails and decrease the open road miles within the WSR corridor which would protect downstream values associated scenery/vegetation and wildlife.

The action alternatives are consistent with the Standards and Guidelines for the Plan because:

- The visual quality objective for Big Marsh remains at Partial Retention (Medium Scenic Integrity) as seen from Beales and Chinkapin Butte.
- Informal user-defined trails that are displaying resource damage are being modified or closed.
- No trail construction is occurring on the west side of the marsh.
- Motorized use is restricted to roads and trails designated for ATVs.
- The river corridor use is being managed to maintain the current Recreational Opportunity Spectrum (ROS) level of Semi-Primitive.
- No new facilities are being constructed within the marsh area.
- All woody debris remains in the stream channel.
- A water temperature and monitoring program has been established.
- Open road density within the corridor would be below existing levels.

***Crescent Creek***

In Crescent Creek, the scenery/vegetation associated ORV is located in the steep portion of the canyon where the large ponderosa pines have been identified as unique. For wildlife, the closest potential for affect would be the water thrush which is associated with the riparian vegetation near the Crescent Creek campground. No designation of motorized trails would occur in riparian-associated vegetation or in the Little Deschutes canyon. For more information, reference the Wildlife section.

Alternatives B, D, and E have no proposed trails within this corridor. All alternatives utilize the Metolius-Windigo horse trail which is on the border of the interim boundary near Cold Creek. In Alternative C, a trail that accesses Black Rock Pit would be located on an old road bed where use is occurring and no further ground-disturbing activity would occur. Expected increases in riders and associated use would be confined to the hardened surface itself. The increase in trail mileage is offset by closure of a road in all action alternatives that leads from the Crescent Creek campground to a user-created motorized trail down a steep segment and terminating at the river. At the end of a road is a small dispersed camping site that may displace some campers that traditionally use the site, but there are many similar sites nearby that have the identical setting.

In conclusion, all action alternatives protect the ORVs proposed for Crescent Creek; including Alternative C which utilizes an existing roadbed and protects by avoidance the scenery/vegetation and wildlife that has been identified as unique to the region.

The action alternatives are consistent with the interim Standards and Guidelines found in the Deschutes National Forest Plan for recreational rivers because:

- Motor vehicle travel is restricted as necessary to protect river values
- Opportunities for OHV use is not in concentrated or sensitive areas
- All activities are consistent with Partial Retention Visual Quality Objective

***Little Deschutes River***

The Little Deschutes River ORVs for geology and vegetation are generally related to the Little Deschutes Canyon (outside the Three Trails OHV project area boundary). However, the Resource Assessment found "…the scenic variety associated with the stream is found along its length rather than in its surroundings. In the upper portion, the deepness of the canyon and steep walls provide opportunities to view the craggy rock outcrops in the middleground. This same physical character and topography which limits views also focuses attention on a stream with unique features and diversity along its length such as loop meanders, meander scars, and oxbows."

Designation of roads and trails is more than offset by Project Design Features that move and rehabilitate

trails out of areas that are in those areas described as unique (loop meanders, meander scars, and oxbows). Therefore, all action alternatives protect the scenery resource for the Little Deschutes River.

The action alternatives are consistent with the Standards and Guidelines for the Plan because:

- New trail construction is outside of OCRA and the Little Deschutes River canyon.
- Informal user-defined trails that are displaying resource damage are being modified or closed.
- All roads before being closed are considered for conversion to trails.
- Only one trail bridge over the river; it is being constructed for resource protection and visitor convenience.
- Dispersed camping in staging areas match the Travel Management DEIS setbacks for motorized vehicles of 30 feet from water.
- Motorized use is restricted to roads and trails designated for ATVs.
- Cow Camp was considered as a location for a staging area. Monitoring of dispersed sites related to staging for OHV riders has determined more logical areas to better define camping and limit impacts where the use is already occurring.
- No new road construction would occur and road density would be reduced above current levels.
- No changes would occur to roads 5830300 and 5835300.
- Interpretive structures would be focused on the values of the river corridor as well as providing a strong stewardship message.
- A water temperature and monitoring program has been established.
- In Alternative C, the bridge is designed so that there are no bridge features or rip-rap within the bed or banks of the river.

**Cumulative Effects**

The Lava Rock Motorized Trails Project, as currently proposed, could include up to 250 miles of additional proposed motorized trails for different classes of vehicles. The Ochoco Summit Motorized Trail Project is proposing approximately 124 miles of OHV trails for the different classes of vehicles and the Meadow Lakes Restoration Project is currently early in the development process with no specific proposal for miles of trails.

The Deschutes and Ochoco National Forest and surrounding forests in the entire Pacific Northwest 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, although the acquisition of adjacent Cascade Timberlands (Fidelity LTD lands) for a state forest would remain open for ATVS with limited restrictions[33].

Although not as clear a trend, motorized access for dispersed recreation is also cumulatively limited as a result of the overall limits on motorized cross-country travel and the implementation 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 cross-country travel.

Since 2000, there 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 road closures and decommissioning are also likely to continue.

[33] 2009, Conversation with Doug Decker, ODF State Forester at a Crescent/Gilchrist Community Action Team Meeting and http://www.oregon.gov/ODF/STATE_FORESTS/gilchrist.shtml.

The Lava Rock Motorized Trails Project, 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 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 EIS 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. 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.

It is reasonable to assume 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 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.

# Soil Quality

This section incorporates the Soil Quality report in its entirety. The Zone of Influence for discussion on effects is bounded by the project area and its overlap with existing detrimental conditions such as roads, trails, and past management activities. Best Management Practices for soils quality are hereby incorporated into the discussion of effects of the activities. They can be found in Appendix B.

Approximately 143 miles of user-created trails on the Crescent Ranger District are currently being used, in addition to the existing roads (Table 26). In addition, the planning area contains approximately 1,337 miles of roads on both Forest Service lands and private lands. Many of these trails are not in the most appropriate areas, especially surrounding private residences and near water features. In general, the implementation of the action alternatives of this project would reduce the overall road density in almost every subwatershed, as well as close and rehabilitate many user-created trails immediately adjacent to homes in the Two Rivers North subdivision. They also would pull back vehicular traffic in the riparian resources associated with the Little Deschutes River, where there is the greatest potential to affect water quality. All action alternatives would replace these trails with quality engineered routes that not only deliver the rider's experience many have requested, but it also places them in areas that are best suited over the long term.

**Target Landscape Condition**

The primary goal for managing the soil resource on the Deschutes National Forest is to maintain or enhance soil conditions at acceptable levels without impairment of the productivity of the land. Simply, the soil must be able to grow vegetation that was naturally there before the disturbance. The extent of detrimental soil disturbances is minimized through the application of management requirements, Project Design Features and mitigation measures designed to minimize, avoid, or eliminate potentially significant effects, or rectifying the effects in site-specific areas by restoring the affected environment. The land effectively has to take in and distribute water, with erosion rates near natural levels. The biological productivity of soils is ensured by management prescriptions that retain adequate supplies of surface organic and coarse woody matter.

**Affected Environment**

The Three Trails OHV project analysis area covers approximately 93,016 acres in the High Cascade physiographic area where essentially all landforms, rocks, and soil are products from volcanic events or from glaciations that occurred as recently as ten thousand years ago. The landscape is generally characterized by smooth, nearly level glacial moraines and outwash plains, gentle to uneven lava plains with a few cinder cones and buttes. Muttonchop Butte, Little Odell Butte, and Beales Butte are cinder cones; these are areas of relief on which slopes of greater than 30 percent are found. One of the major landforms in the area is the Little Deschutes Canyon in the Oregon Cascades Recreation Area (OCRA) where there is no current or planned motorized travel. This glaciated canyon is the longest and the deepest on the east flanks of the High Cascades. The majority of the remaining slopes in the project area can be characterized as relatively gentle compared to the canyon and range between 0 and 80 percent primarily on the slopes of the cinder buttes.

The eruption of Mt. Mazama 7,700 years ago covered the area with ash and pumice to depths up to ten feet (Larsen 1976). The rhyolitic Mazama ash and pumice fall is relatively coarse textured and undeveloped due to its young age. Surface and subsurface textures range from coarse sand to small gravel sized material. Soil A horizons are generally less than three inches thick, with a shallow A/C horizon of less than 10 inches in thickness. "C" horizon material varies from 20 to 40 inches thick before

the slightly more developed buried soil is reached. Higher bulk densities and coarse fragment contents are the most distinguished features of the residual buried soils. Soil moisture regimes are xeric in the basin and the eastern edges of the area and ustic in the higher elevation sections. Soil temperature regimes range from frigid to cryic.

Soils within the project area have developed under the influence of local geologic parent materials, topography, annual precipitation, and associated vegetative communities. Soil types located on the slopes of the larger buttes are primarily comprised of a deep mantle of ash and pumice fall from Mt. Mazama over an older paleosol derived of airfall ash, and basaltic residuum (weathered in place). A deep mantle of ash and pumice fall also overlies an older soil located above glacial outwash within the LaPine Basin.

Soils derived from Mazama ash tend to be non-cohesive (loose) and have very little structural development due to their young geologic age. Dominant soils in the project area have naturally low bulk densities and low compaction potential. However, mechanical disturbances can reduce soil porosity to levels that limit vegetative growth, especially where there is a lack of woody debris and surface organic matter to help cushion the weight distribution of motorized vehicles. Dominant soils in the project area are not susceptible to soil puddling damage due to their lack of plasticity and cohesion.

Soil displacement is one of the most readily recognized problems associated with pumice soils. Detrimental soils displacement is defined by the Forest Service Manual, R-6 Supplement No. 2500.98-1, 2521.03, 3, "detrimental displacement is the removal of more than 50 percent of the A horizon from a area greater than 100 square feet. The surface layers are easily removed by mechanical activity exposing light-colored material. The maneuvering of motorized vehicles is most likely to cause soil displacement damage on steeper landforms and adjacent to wet areas and stream channels."

The dominant soils within the project area exhibit high water infiltration rates and are classified as well to excessively drained. Surface soils are ash fall, pumiceous loamy sands, and sands. Permeability is very rapid in surface soils and moderate to rapid in the buried soils. Some of these soils have a water table that can be encountered within two to five feet from the surface (typically near valley bottoms). There are soils that occur as a result of ash and pumiceous deposits on top of older glacial outwash plains. Glacial soil landtypes have somewhat poorly drained soils and are usually associated with high water tables. Underlying bedrock in the planning area is mostly basalts and andesites that have a high to moderate capacity to store water and a low to moderate rate of water transmission unless storage capacity is exceeded. Table 38 exhibits characteristics of soil mapping units and percent of the total analysis area.

**Erosion Hazards**

Soils across the District 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 erosive forces, which is inversely related to surface texture and is calculated based on 100 percent 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 NF and Crooked River National Grassland generally have higher values than those on the Crescent Ranger District, because of the proximity to its source, Mt. Mazama.

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. 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.

Inherent erosion hazard is a relative rating for surface erosion based on the ability of the soil to take in water, resistance of the soil surface to the effect of rainfall and water movement, and the effect of topography or slope gradient. The rating for surface erosion potential assumes that the surface cover of vegetation or litter has been disturbed or destroyed and bare surface soils are exposed to the elements of erosion. The following ratings are intended for planning purposes to indicate relative potential erosion hazards.

> **Low:** Soils are generally on gentle to moderate slopes with no appreciable hazard for erosion.
>
> **Moderate:** Has potential for some losses of surface materials, but soils are sufficiently resistant to erosion to permit limited and temporary exposure of bare soil during development or use.
>
> **High:** Has potential for considerable loss of surface materials and unprotected soils would erode sufficiently to affect soil productivity.
>
> **Severe:** Has highest potential for loss of surface soil material, with greatest affect to soil productivity.

The likelihood of intense rainfall for extended durations tends to be greatest near the Cascade Crest, although all portions of the District 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. This is most evident where water becomes channeled on disturbed sites such as road surfaces, skid trails, water-bar outlets, and road drainage structures.

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 the glaciated terrain on the District and most pronounced near the Cascade crest. Organic matter content is relatively low throughout all areas and structure varies according to the age and type of parent material.

Mass movements, or landslides, occur when earthen materials become unstable and slide downslope in response to gravity. There are no management-related landslides known to exist within the project area. The high permeability of the pumice and ash-influenced soil materials generally precludes the buildup of hydraulic pressures that could trigger landslides.

**Table 38. Soil Characteristics of the Three Trails OHV Project Area**

| Mapping Unit[34] | % Slope | Natural Stability | Surface Erosion Potential | Compaction Potential | Displacement Potential | Sediment Yield Potential | Acres | Percent of Analysis Area |
|---|---|---|---|---|---|---|---|---|
| 01 | 0-30 | Very Stable | N/A | N/A | N/A | | 1,328.24 | 1.43 |
| 02* | 0-50 | Occasional small slumps | Moderate | Moderate | Moderate | Moderate to Low | .60 | 0.00 |
| 05* | 0-10 | Very Stable | Low | Moderate | Low | Low-Moderate | 807.75 | 0.73 |
| 08* | 0-30 | Stable | Low-High | Moderate | Low | Variable | 106.58 | 0.11 |
| 09* | 25-70 | Stable | Low | Low | High | Low | 28.85 | 0.03 |
| 10* | 20-100 | Stable-Moderately Stable | Moderate | Low | Moderate to High | Moderate | 215.86 | 0.23 |
| 15* | 0-10 | Stable | Moderate | Low | Low | Low- | 22.84 | 0.02 |
| 19 | 0-30 | Very Stable | Low | Low-Moderate | Low-Moderate | N/A | 117.10 | 0.13 |
| 2B | 0-30 | Very Stable | Low-Moderate | Low-Moderate | Low-Moderate | Low | 1,002.38 | 1.08 |
| 43* | 0-5 | Very Stable | Low | High | Low | Lowe | 2,282.51 | 2.45 |
| 44* | 0-5 | Very Stable | Low | Low-Moderate | Low-Moderate | Low | 237.68 | 0.26 |
| 82* | 25-70 | Stable | Moderate | Low | High | Low-Moderate | 42.05 | 0.05 |
| 81* | 25-70 | Stable | Moderate | Low | High | Low-Moderate | 7.58 | 0.01 |
| 84* | 30-80 | Stable | Low-Moderate | Low | High | Low-Moderate | 25.72 | .03 |
| 8A* | 30-70 | Stable | Low-Moderate | Low | High | Moderate | 37.44 | 0.05 |
| 8B | 0-30 | Very Stable | Low-Moderate | Low | Moderate | Low-Moderate | 769.82 | 0.83 |
| 96* | 0-30 | Very Stable | Low | Low | Low-Moderate | Low | 15,757.80 | 16.94 |
| 97 | 0-30 | Very stable | Low | Low | Moderate | Low | 3,088.13 | 3.32 |
| 98 | 0-30 | Very Stable | Low | Low | Moderate | Low | 7,850.92 | 8.44 |
| 9A* | 30-70 | Stable | High-Moderate | Low | High | Moderate-Low | 668.78 | 0.72 |
| 9B* | 30-70 | Stable | High-Moderate | Low | High | Moderate-Low | 849.03 | 1.07 |
| 9C* | 30-70 | Stable | Moderate-High | Low | High | Low-Moderate | 1,036.40 | 1.30 |
| 9F | 0-30 | Very Stable | Low-Moderate | Low-Moderate | Low-Moderate | Low | 1,948.07 | 2.45 |
| 9G | 0-30 | Very Stable | Low-Moderate | Low | Moderate | Low | 212.05 | 0.23 |
| 9J* | 30-60 | Stable | Moderate | Low | High | Low-Moderate | 32.68 | 0.04 |
| 9L | 0-30 | Very Stable | Low | Low | Moderate | Low | 18,660.22 | 20.06 |
| 9M | 0-30 | Very Stable | Low-Moderate | Low | Moderate | Low | 6,324.75 | 6.80 |
| 9N* | 30-70 | Stable | Moderate-High | Low | High | Low-Moderate | 5,232.46 | 5.63 |

[34] * Indicates soil types within the project area that are sensitive. Mapping unit 96 may be associated with a high water table; however field verification has indicated otherwise in several cases.

| Mapping Unit[34] | % Slope | Natural Stability | Surface Erosion Potential | Compaction Potential | Displacement Potential | Sediment Yield Potential | Acres | Percent of Analysis Area |
|---|---|---|---|---|---|---|---|---|
| 9P* | 30-70 | Moderately Stable to Unstable | High to Moderate | Low | High | Low-Moderate | 14.77 | 0.02 |
| 9R* | 30-70 | Moderately Stable | High to Moderate | Low | High | Low-Moderate | 2,670.52 | 2.87 |
| 9T* | 25-60 | Moderately Stable | Moderate-High | Low | High | Low-Moderate | 680.09 | 1.94 |
| 9W* | 0-30 | Very Stable | Low | Low | Moderate | Low | 645.52 | 0.69 |
| 9Z* | 30-70 | Stable | Moderate | Low | High | Low-Moderate | 1,802.45 | 0.39 |
| HG | 5-40 | Stable | Low-Moderate | Moderate-Low | Low-Moderate | Low | 147.22 | 0.16 |
| PA* | 30-70 | Very Stable | Low-Moderate | Low-Moderate | High | Low | 647.28 | 0.70 |
| PD* | 30-60 | Stable | Low-Moderate | Low-Moderate | Low-High | Low-Moderate | 1,230.18 | 1.32 |
| PE* | 60+ | Moderately Stable | Low-Moderate | Low | Moderate-High | Low-Moderate | 903.56 | 0.97 |
| PF | 0-30 | Very Stable | Low-Moderate | Low | Low-Moderate | Low | 506.04 | 0.54 |
| PG* | 0-30 | Very Stable | Low-Moderate | Low-Moderate | Low-Moderate | Low | 8,378.53 | 9.01 |
| PH* | 0-30 | Very Stable | Low | Low-Moderate | Low-Moderate | Low | 22.37 | 0.02 |
| PK | 0-30 | Very Stable | Low | Low | Low-Moderate | Low | 1,069.36 | 1.15 |
| PL* | 40-80 | | | | | | 40.07 | 0.04 |
| PN* | 0-70 | Stable | Low-High | Low | Moderate-High | Low-Moderate | 1,328.96 | 1.43 |
| WE* | 0-5 | Very Stable | Low-Moderate | Low-High | Low-Moderate | Low | 554.80 | 0.60 |
| WF* | 0-10 | Very Stable | Low | Low-Moderate | Low-Moderate | Low-Moderate | 433.49 | 0.47 |
| WG* | 0-30 | Very Stable | Low-Moderate | Low-Moderate | Low-Moderate | Low | 2331.18 | 2.51 |
| WH | 0-10 | Very Stable | Low-Moderate | Moderate | Low-Moderate | Low | 3,253.86 | 3.50 |
| **Total** | | | | | | | **93,006** | **100** |

**Sensitive Soil**

The planning area contains soils classified as "sensitive" by the Deschutes National Forest Land and Resource Management Plan (USDA, 1990). Criteria for identifying sensitive soils to management activities are listed in the Deschutes LRMP (Appendix 14, Objective 5). Sensitive soil types include:

- Soils on slopes over 30 percent,
- Slopes with a high hazard rating for surface erosion,
- Potentially wet soils with seasonal or year-long high water tables,
- Soils associated with frost pockets in cold air drainages and basins, and
- Soils that occur in localized areas of rocky lava flows.

Approximately 56 percent (52,298 of 93,016 acres) contains landtypes with localized areas of sensitive soils (Table 39).

**Table 39. Landscape Acres that Contain Localized Areas of Sensitive Soils within the Three Trails OHV Project Area**

| SRI Map Unit Symbol | Geomorphology (Representative Landforms) | Type of Concern[35] | Sensitive Soil (Acres) |
|---|---|---|---|
| 06, 09, 10, 12, 5A, 81, 84, 8A, 8P, 9B, 9C, 9N, 9T, 9Z, PC, PN, PP | Cinder cones, high elevation rock outcrops, composite volcanoes (30% slopes), high or extreme erosion hazard. | 1, 4, 5 | 17,064.0 |
| 15, 9W | Depressions or flats | 2 | 668.4 |
| 02, 05, 43, 44, 96, PG, WE, WF, WG, WH | Seasonal high water table | 3 | 34,566.0 |

Soil Resource Inventory, Deschutes National Forest, 1976.

**Management Direction**

The project area was analyzed as directed by the Deschutes National Forest Land and Resource Management Plan (LRMP USDA, 1990) as amended.

The Deschutes National Forest Plan Standard and Guideline on Forest Soils directs that all management ground-disturbing activities maintain or enhance long-term soil productivity (SL-1). "Alternative management practices will be developed and mitigation measures will be implemented when activities will result in detrimental soil compaction or displacement on that will reduce soil productivity or accelerated erosion." Forest Plan standard and guideline SL-2, states that 80 percent of an activity area must be in acceptable soil condition after the activity is completed. This includes all system roads, landing, spur roads, and skid trails. Forest Plan standard and guideline SL-4 requires that where this direction cannot be met, the site will be rehabilitated to bring the soil productivity to within acceptable limits.

Region 6 Soils Management Guidelines in Forest Service Manual (FSM 2500, R-6 supplement 2500-98-1) describe conditions detrimental to soil productivity and outline Soil Quality Standards to limit the extent of these conditions to less than 20 percent of an activity area. Detrimental soil conditions are described in the Soil Quality Standards as follows:

- Detrimental soil compaction in volcanic ash/pumice soils is an increase in soil bulk density of 20 percent or greater over the undisturbed level.
- Detrimental puddling occurs when the depth of ruts or imprints is six inches or greater.
- Detrimental displacement is the removal of more than 50 percent of the A horizon from an area greater than 100 (10' x 10') square feet and at least five feet in width.
- Detrimental burn damage requires significant color change of the mineral soil surface in an area greater than 100 (10' x 10') square feet to an oxidized reddish color, with the next one-half inch below blackened from organic matter charring as a result of heat conducted from the fire.

[35] **Management Concerns for The Three Trails OHV Project as it Relates to Sensitive Soils**

1) On slopes greater than 30 percent, loose sandy soils are susceptible to soil displacement.
2) Frost pockets in cold air drainages and basins.
3) Seasonal high water tables.
4) High or extreme erosion hazard.
5) Localized areas of rocky lava flows.

- Detrimental erosion requires visual evidence of surface loss over an area greater than 100 (10' x 10') square feet, rills or gullies, and/or water quality degradation from sediment or nutrient enrichment.

This Regional policy is consistent with the LRMP interpretation of Forest-wide standards and guidelines SL-3 and SL-4, on file at the Crescent Ranger District Office (Final Interpretations, Document 96-01, Soil Productivity, 1996).

**Assumptions and Methodology**
**Detrimental Soil Disturbance**
To estimate soil conditions within the project area, the following resources were utilized: Geographical Information System (GIS), aerial photos, field reconnaissance, best available research, and soil quality monitoring. GIS analysis utilized the soil resource inventory and past activities and road data to determine the location and extent of soil effects and existing conditions.

For the purposes of this analysis, a trail width of five feet is used to calculate the overall footprint of the trail system. This slightly over estimates effects because the trail width is generally 50 inches. Trail width varies by class of vehicle; trails specifically designed for 4-wheel drive vehicles can be wider (up to 80 inches) and those for motorcycles can be slimmer. To the largest extent, trails have been designed for ATVs and motorcycles (Classes I and III). Therefore, the width that was used for calculation reflects a conservative average trail width.

Areas used for staging are basically where riders are parking and camping now. In these areas, vegetation has mostly been removed and the impacts to the soil resource have already occurred.

**Management-Related Disturbances**
**Timber Management**
Based on harvest history, various silvicultural prescriptions including thinning treatments, intermediate harvest, and regeneration harvest have occurred within the project area between 1950 and the present. Temporary roads, log landings, and primary skid trails were constructed and used to access individual harvest units of past timber sales. Research studies and local soil monitoring have shown that soil compaction and soil displacement account for the majority of detrimental soil conditions resulting from ground-based logging operations (Deschutes N.F., Soil Monitoring Reports; Page-Dumroese 1993; Geist 1989 and 1999). Some long-term adverse effects to soil productivity remain where surface organic layers were displaced and/or multiple equipment passes caused deep compaction.

Ground-based harvest activities have occurred on project areas totaling approximately 61,779 acres of the 93,016 acre project area. Of course, an actual harvest unit where activity occurs is on a much smaller subset of acres, but they have potential for overlap with a designated trail system.

In harvest activity units, much of the random disturbance between main skid trails and away from landings (where detrimental soil conditions are likely to persist if no restorative measures were undertaken) has decreased naturally over time. It is assumed soils in these areas have returned to undisturbed density levels in the short-term (less than five years) through natural processes (i.e., root penetration, frost heave, rodent activity, freeze-thaw, and wetting/drying cycles). The establishment of ground cover vegetation and accumulation of organic matter has been improving areas of past soil displacement. For this analysis, it is assumed that harvest units that were completed over 20 years ago have returned to background levels prior to the disturbance.

**Roads and User-Created Trails**
Most of the management allocations within the project area excluding Old Growth, Late Successional Reserves, and Wild and Scenic Rivers are currently open to motorized cross-country travel. The planning area contains approximately 1,545 miles on roads (Table 40) both Forest Service Lands and private lands. It also contains approximately 130 miles of known and mapped user-created trails (Table 42). Upon further detailed analysis utilizing Geographical Information System data and on the ground information, the total trail mileage in Alternative B was determined to be approximately 143 miles. These roads and trails are assumed to be areas of disturbance and are considered compacted and non-productive. It is also assumed that most user-created trails were built in non-productive areas because they tend to develop in areas that are previously disturbed. Most of the precipitation that falls on surfaces is transmitted as surface runoff, and if not properly engineered, can potentially be primary sources of accelerated surface erosion.

**Potential for 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 unmaintained 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 potentially affected by this project. OHV trails can intercept and concentrate runoff that tends to saturate localized areas.

***Compared to most other areas with different soil types, on the Crescent Ranger District, there are relatively few circumstances of accelerated erosion.*** [36] Access within the project area was generally provided in the era when stands were managed primarily for timber, access to private land owners, and user-created roads and trails for various reasons. Due to the lack of structural development, although well-drained and porous, volcanic pumice and ash soils are more easily eroded where water becomes channeled on disturbed sites such as road surfaces, skid trails, water-bar outlets, and road drainage ditches. The severity of soil erosion depends on many factors, including slope gradient, inherent soil erodability, the amount of bare ground, and the intensity of precipitation events. Non-vegetated roadside ditches have been observed on the District as having the greatest potential for transporting sediments. In extreme precipitation events, such as rain on snow, or a sudden warming of ambient air temperature during winter conditions when there is a snowpack can cause overland flow in roadside ditches over frozen ground or snow and ice. Also, high precipitation in the summertime as a result of thunderstorm activity can trigger potential sediment transport from the roadside ditches to the stream channels if the slope gradient is downward towards the stream. There is no empirical data on sediment transport data in roadside ditches in the analysis areas.

Roads are grouped into five categories Maintenance Level:

- Maintenance Level 1 - Maintained for basic custodial care and may or may not be physically blocked and intended for administrative use. There is resource damage occurring on the roads attributable to OHV use which constitutes unauthorized use. It is a violation of CFR CFR

[36] Physical observations by Kenneth Kittrell (Transportation Manager/Engineer), Paul Powers (Fisheries Biologist) and Rick Cope (Hydrologist and Soil Scientist)

261.12c or CFR 261.15h. Implementation of the Travel Management Rule would close all Maintenance Level I roads except for administrative use.

- Maintenance Level 2 - Maintained for high clearance vehicles and allows for traffic from all classes of licensed and unlicensed vehicles.

- Maintenance Level 3 through Level 5 (paved) roads are defined as maintained for passenger cars with varying degree of user comfort, from low to high.

Roads are analyzed by 6th Field Subwatersheds (Figure 22). The following Table 40 displays the total (Maintenance Level 2, 3, 4, and 5) which are open to motorized travel and (Maintenance Level 1) which are closed to motorized travel yielding densities by 6th Field Subwatersheds.

**Table 40. Miles of Roads within the Three Trails OHV Planning Area**

| 5th Field Watershed | 6th Field Subwatershed | Total Acres (% of Planning Area in Watershed) | Road Miles | Total Road Density |
|---|---|---|---|---|
| Crescent Creek | Cold Creek | 13,435.5 (60.3) | 55.7 | 2.8 |
| | Lower Big Marsh Creek | 19,535.8 (24.9) | 74.9 | 2.5 |
| | Middle Crescent Creek | 18,051.4 (50.7) | 134.2 | 4.8 |
| | Lower Crescent Creek | 20,144.3 (4.8) | 120.1 | 3.8 |
| Little Walker Mountain | Corral Springs | 12,791.6 (20.5) | 118.2 | 5.9 |
| | Crescent Butte | 13,150.8 (34.5) | 133.8 | 6.5 |
| | Little Walker Mtn. | 14,044.0 (89.5) | 128.6 | 5.9 |
| | North Paunina | 12,944.5 (42.0) | 109.7 | 5.4 |
| | North Walker | 22,661.1 (4.6) | 136.5 | 3.9 |
| | South Paunina | 10,865.1 (50.6) | 85.6 | 5.0 |
| Upper Deschutes River | Bunny Butte | 13,366.8 (50.4) | 76.3 | 3.7 |
| | Clover Butte | 12,580.9 (11.9) | 37.7 | 1.9 |
| | Gilchrist Junction | 8,517.7 (19.2) | 67.8 | 5.1 |
| | Hemlock Creek | 17,215.3 (54.0) | 81.8 | 3.0 |
| | Little Odell Creek | 10,629.6 (88.0) | 85.0 | 5.1 |
| Wickiup | Odell Creek | 13,830.3 (1.8) | 99.1 | 4.6 |
| **Total** | | **233,764.8** | **1545.1** | **4.2** |

The following Figure 22 and Table 41 relate each subwatershed to the Junction, Rivers, and Walker subareas being planned for an OHV trail.

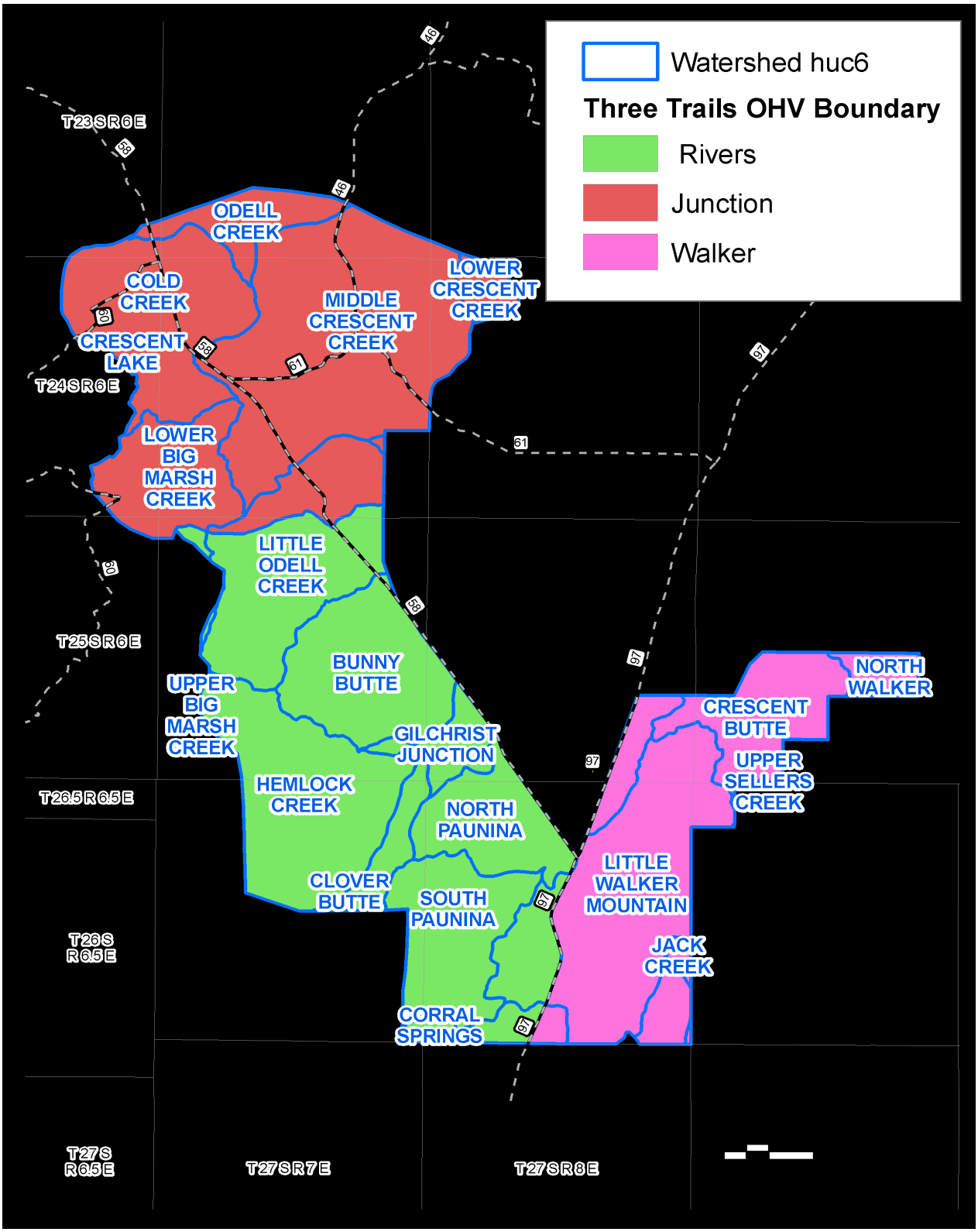


**Figure 22. Subareas that Overlap Sixth Field Watersheds for Three Trails OHV Analysis Area**

**Table 41. Percent Subarea by 6th Field Watershed**

| Watershed | Subwatershed | Subarea | Acres | Percent of Subarea |
|---|---|---|---|---|
| Crescent Creek | Cold Creek | Junction | 8,102 | 23.2 |
| | Crescent Lake | Junction | 4 | Less than 1 |
| | Lower Big Marsh Creek | Junction | 4,627 | 13.2 |
| | | Rivers | 238 | 0.6 |
| | Lower Crescent Creek | Junction | 984 | 2.8 |
| | Middle Crescent Creek | Junction | 16,125 | 46.1 |
| | Upper Big Marsh Creek | Rivers | 1 | Less than 1 |
| Klamath Marsh Jack Creek | Jack Creek | Walker | 303 | 1.6 |
| Little Walker Mountain | Corral Springs | Rivers | 1,222 | 3.1 |
| | | Walker | 1,402 | 7.3 |
| | Crescent Butte | Walker | 4,537 | 23.7 |
| | Little Walker Mountain | Rivers | 2,029 | 5.2 |
| | | Walker | 10,546 | 55.1 |
| | North Paunina | Rivers | 4,157 | 10.7 |
| | | Walker | 1,286 | 6.7 |
| | North Walker | Walker | 1,059 | 5.5 |
| | South Paunina | Rivers | 5,507 | 14.1 |
| Sellers Creek | Upper Sellers Creek | Walker | 19 | 0.1 |
| Upper Little Deschutes River | Bunny Butte | Junction | 51 | 0.1 |
| | | Rivers | 6,693 | 17.2 |
| | Clover Butte | Rivers | 1,502 | 3.9 |
| | Gilchrist | Rivers | 2 | Less than 1 |
| | Gilchrist Junction | Rivers | 1,636 | 4.2 |
| | Hemlock Creek | Rivers | 9,316 | 23.9 |
| | Little Odell Creek | Junction | 2,713 | 7.7 |
| | | Rivers | 6,595 | 16.9 |
| Wickiup | Odell Creek | Junction | 2,361 | 6.7 |
| **Total** | | | **93,016** | |

***Recreation Activities***

The extent of detrimental soil conditions associated with recreation use is relatively minor in comparison to existing roads and disturbances from harvest. Effects from dispersed recreation activities are usually found along existing roads, trails, and streams. The majority of dispersed campsites across the planning area are associated with water features or other desirable destinations such as Walker Mountain that have been used for many years. All known sites were mapped for this project.

For this analysis and factored into the calculation for area of potential disturbance the following State of Oregon standard OHV classes were used:

**Class I** - Vehicles 50” wide or less and dry weight of 800 pounds or less, have a saddle or seat and travel on three or four tires (typical ATV).

**Class II** - Vehicles more than 50” wide or having a dry weight of more than 800 pounds, but less the 8,000 pounds (4-wheel drive vehicles).

**Class III -** Vehicles riding on two tires and have a dry weight of less than 600 pounds (motorcycles).

**User-created Trails**
User-created trails typically occur where vegetation has been cleared or within a previously disturbed area; developed by users to access streams, connect roads, or for the rider's favorite view. Motorized access off designated routes by Off-highway Vehicles (OHVs) has variably disturbed the soil resource throughout the project area. Focused use of this type is generally associated with play areas on buttes and hill slopes, while less concentrated use is associated with point to point and loop trails created by motorized access off designated routes. OHV travel is generally unrestricted through some Forest Plan Management Areas, such as general forest, but the implementation of the Travel Management Rule would restrict motorized vehicles primarily to designated routes (or Maintenance Level 2 roads) only. The greatest evidence of user-created routes is near the vicinity of Two Rivers North, Crescent Lake Junction and to a lesser extent on Walker Mountain. These are the areas that were identified by a chartered working group of citizens as a place of limited public support for designating a trail system. There are also numerous trails that access (and in some cases ford) the Little Deschutes River. These have the greatest potential for sediment transport which would affect water quality and thus, they are prioritized for closure and rehabilitation (Figure 2).

Play areas such as Muttonchop Butte and Black Rock Pit tend to have extensive soil disturbance as a result of continual use of hill climbs that creates contiguous areas of exposed mineral soil and denuded vegetation. Although these are in already disturbed mineral extraction sites or pits, the concern is for expansion of the use. Some play areas on steep hillsides have developed in areas that overlap areas of historical importance and the desire is to encourage riders in other areas where loss of the site's integrity is not of concern. Cross-country trails tend to impact a lesser percentage of the land base by creating relatively narrow trails at varying densities, although hundreds of miles of these types of trails are present on the two forest planning areas.

Soils where play areas or trails have been created by cross-country travel have had physical and vegetated characteristics affected by OHVs and automobile traffic. Cross-country routes generally displace 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 or play areas are often too steep in grade, creating conditions that displaces mineral soil and gullies the trail. Most trail sections outside of mineral extraction pits in the project area lack adequate drainage and are generally not maintained to minimize erosion or gullying of the trail tread. Trails that are not located near water are primarily losing productivity due to the erosion loss of surface organic and mineral soil horizons. Trails located near water (generally around the Little Deschutes river) 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, in addition to the localized loss of productivity.

Although there are numerous areas being used for parking and staging in the project area, the following discusses those areas where riders are generally using at this time. These areas are being considered as staging areas in the action alternatives because they are outside riparian resources and to the greatest extent, soil compaction and loss of vegetation has already occurred.

***Rivers:*** This subarea has three staging areas planned in various action alternatives. Rivers North is off the 5825010 road within an open ponderosa pine stand. Approximately one acre of the two to five acre site is already compacted and void of vegetation. Rivers Midway is near Highway 58 railroad trestle on spur road 150 within an open ponderosa pine stand of trees. Approximately three acres surface area is compacted and is absent of vegetation. Rivers South is near the 2011 mineral extraction pit near the junction of Highways 97 and 58 in mostly lodgepole pine where one to two acres is currently dedicated to user-created staging and day use.

***Walker:*** This subarea also has three staging areas being considered in various action alternatives. One is near Highway 97 where two to three acres in a lodgepole/ponderosa pine stand that is currently being used as a day use parking area and staging. It is adjacent to an area of timber harvest where young trees have been regenerated (existing plantation). The other smaller area is near Walker Rim on road 9755 where approximately two acres of cleared vegetation is currently being used as a dispersed camping site.

**Table 42. User-created Trails Expressed by Miles and Densities (miles per square mile) by 6th Field Subwatershed**

| 6th Field Subwatershed | Total Acres (% of Planning Area in Watershed) | User-created Trail Miles | Total User-created Trails Density ($mi/mi^2$) |
|---|---|---|---|
| Cold Creek | 13,435.51 (60.3) | 3.7 | 0.2 |
| Lower Big Marsh Creek | 19,535.8 (24.9) | 0.0 | 0.0 |
| Middle Crescent Creek | 18,051.4 (50.7) | 0.0 | 0.0 |
| Lower Crescent Creek | 20,144.3 (4.8) | 0.0 | 0.0 |
| Corral Springs | 12,791.6 (20.5) | 10.5 | 0.5 |
| Crescent Butte | 13,150.8 (34.5) | 0.0 | 0.0 |
| Little Walker Mountain | 14,044.0 (89.5) | 13.7 | 0.6 |
| North Paunina | 12,944.5 (42.0) | 20.3 | 1.0 |
| North Walker | 22,661.1 (4.6) | 0.0 | 0.0 |
| South Paunina | 10,865.1 (50.6) | 20.9 | 1.2 |
| Bunny Butte | 13,366.8 (50.4) | 22.1 | 1.1 |
| Clover Butte | 12,580.9 (11.9) | 4.5 | 0.2 |
| Gilchrist Junction | 8,517.7 (19.2) | 18.4 | 1.4 |
| Hemlock Creek | 17,215.3 (54.0) | 14.4 | 0.6 |
| Little Odell Ck. | 10,629.8 (88.0) | 1.0 | 0.1 |
| Odell Creek | 13,830.3 (1.8) | 0.7 | 0.0 |
| **TOTALS** | **233,764.76** | **130.16** | **N/A** |

The following Table 43 illustrates the amount of user-created tails and roads located within Riparian Reserves (Northwest Forest Plan) and Riparian Habitat Conservation Areas (INFISH) within the project area. There are no perennial streams in the Walker segment.

**Table 43. Roads and User-created Trails within the Three Trails OHV Project Area and within Riparian Reserves by Subwatershed**

| 6th Field Subwatershed | Riparian Reserve Acres (% of Riparian Area in Watershed Analysis) | User-created Trail & Road Miles in Riparian Areas | Total User-created Trails & Road Density (mi/mi$^2$) |
|---|---|---|---|
| Cold Creek | 3,866.6 (28.7) | 14.4 | 2.4 |
| Lower Big Marsh Creek | 6,307.1 (32.2) | 10.7 | 1.1 |
| Middle Crescent Creek | 1,159.9 (6.4) | 4.5 | 2.5 |
| Lower Crescent Creek | 1419.9 (7.0) | 6.5 | 2.9 |
| Corral Springs | 66.7 (0.5) | 0.2 | 2.0 |
| Crescent Butte | 0.0 | 0.0 | 0.0 |
| Little Walker Mountain | 5.2 (0.0) | 0.0 | 3.7 |
| North Paunina | 1221.0 (9.4) | 20.3 | 1.0 |
| North Walker | 21.1 (0.1) | 0.0 | 0.0 |
| South Paunina | 675.6 (6.2) | 6.9 | 6.6 |
| Bunny Butte | 914.0 (6.8) | 6.6 | 4.6 |
| Clover Butte | 2,548.1 (20.2) | 8.1 | 2.0 |
| Gilchrist Junction | 1412.1 (16.5) | 11.4 | 5.2 |
| Hemlock Creek | 4460.6 (25.9) | 13.2 | 1.9 |
| Little Odell Creek | 927.5 (8.7) | 3.0 | 2.1 |
| Odell Creek | 2530.6 (18.2) | 6.7 | 1.7 |
| **TOTALS** | **27,535.9** | **102.2** | **N/A** |

***Livestock Grazing***

There has been no grazing in the planning area since 1994. Residual effects from livestock grazing to the soil resource are mainly in localized areas of past concentrated use, such as around cattle watering developments. Detrimental soil conditions from grazing have been reduced and likely eliminated by natural processes such as frost heaving and return of vegetation. The Little Deschutes stream bank condition is generally considered to be functioning properly (BLT Final Environmental Impact Statement, 2009). For a discussion on the existing condition of invasive plant species, reference the botanical resources section.

***Coarse Woody Debris (CWD) and Surface Organic Matter***

The effects of management activities on soil productivity also depend on the amount of coarse woody debris (CWD) and surface organic matter retained or removed on affected sites. Decaying wood on the forest floor is critical for maintaining the soil's ability to retain moisture and provide both short and long-term nutrient supplies for the growth of vegetation. Mycorrhizal fungi and soil organisms depend upon the continuing input of woody debris and fine organic matter. Relatively recent and overlapping management activities, such as the BLT, Baja 58, Seven Buttes Return, and the Crescent Lake WUI projects have maintained appropriate levels of wood, meeting Forest-wide Standards and Guidelines.

***Fugitive Dust***

Fugitive dust is created when the soils crust is disturbed or broken and soil particles are released and raised into the air by air currents generated by vehicles (Ouren et al. 2007). Dust dispersal patterns consistently indicate larger particles stay closer to the ground and travel shorter distances, while smaller

particles go higher in the air and travel further away from the source (Padgett 2006). Road surface type, speed, and vehicle type all play a part in how much dust is created (Goossens and Buck 2009).

In general, the effects of fugitive dust are localized and confined largely to the immediate vicinity of the motorized route. The extent to which fugitive dust occurs is variably documented in literature, and in the case of dust generation, varies by vehicle class, speed, and soil type (Goossens 2009). None of the alternatives would reduce the potential for fugitive dust in a measurable quantity over the entire project area; however its proximity to water has the greatest potential effect to water quality. Riders tend to utilize the trail systems during the seasons when dusty conditions can be avoided[37].

Dust particles settling on vegetative matter along the trails may impact plant growth. Dust on the surface of leaves/needles may reduce the plants photosynthetic ability, whereas dust gathering on the undersides may block stomata openings and affect respiration. Visual observation by Meadows et al. (2008) and Padgett (2006) concluded that dust particles did not appear to heavily impact or create long lasting effects to the vegetation if a period of heavy usage was followed by rain. Meadows et al. (2008) noted that edge effect creates more dense vegetation along the trail, due to less competition for food and water. This dense vegetation would act as a filter, limiting the potential dust effects to adjacent understory vegetation.

**Direct and Indirect Effects**

**Alternative A**

Under Alternative A, the soil resource is likely to remain in a detrimental condition in areas currently impacted by motorized vehicle use due to unrestricted cross-country routes and continued use of the areas. 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 effects from motorized cross-country routes.

Alternative A would maintain the status quo for vegetation and soil quality within the project area. Although typical user-created trail systems do not remove trees and take advantage of existing areas of disturbance, herbaceous cover would continue to be removed as trail systems and parking areas expand. It is estimated the user-created trail system has expanded at least two to five miles on a yearly basis.

In general, additional impacts are likely to occur adjacent to existing areas were the concentration of user-created trails exist (i.e. the Little Deschutes River and surrounding the Two Rivers North subdivision, the Crescent Lake Junction area, and Walker Mountain). Detrimental conditions are likely to increase the most in the high use dispersed camping and user-created trail areas, until the Travel Management Rule is implemented.

Trails have increased in number over the past decade as motorized vehicle users explore and expand their range across the project area. Unrestricted motorized cross-country travel has created an estimated 130 miles of user-created OHV trails that currently radiate across the 93,016-acre project area. This amount constitutes less than .001 miles of user-created trail per acre. Although it is not known at what rate new trail miles are, or could be created, the percentage of the land base currently committed to detrimental conditions by this activity can be estimated as follows:

- .001 miles of existing user unauthorized trail/acre = 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 percent of the land base.

[37] 2009, communication with Vicki Ramming, COHVOPS Program Director

This figure (.05 percent of the land base) shows the most important factor to consider is not so much the amount of land base, but where the trails are located. Table 44 displays a summary for roads and user-created trails. Many of these current user-created trails are within riparian resources (12 miles), adjacent to homes, and traverse cultural resources. These are the trails have prompted the Forest Service to design a system in a more sustainable location.

**Table 44. Roads and Trails within Riparian Resources and Sensitive Soils**

| Alternative A | Open road/trail density (within Riparian Resources mi/mi$^2$ | Current Amount of OHV User-Created Trails in Riparian Resources (Miles) | Miles of Open Road within Riparian Resources | Amount of User-Created Trails on Mapped, Sensitive Soils (miles) |
|---|---|---|---|---|
| | 1.45 | 11.5 | 49 | 63.5 |

Under Alternative A, the current level of affect to the soil resource would continue, maintaining the soil resource in a detrimental condition on the tread of trail routes. Additional soil disturbance in the form of compaction of mineral soil and the displacement of surface organics would be incurred under this alternative where new motorized cross-country routes occurred from users exploring and creating new trail routes until the Travel Management Rule is implemented. Detrimental soil conditions would be incurred on the trail tread of these routes if they were trafficked regularly and became definable trails. Although the rate at which new trail miles would be created is not known, this trend would steadily continue until the Rule is in place.

The extent to which detrimental effects to the soil resource would be present across the landscape as a result of user-crested trails would be within Forest Plan Standards and Guidelines for maintaining the productivity of the soil resource. Assuming increases in the occurrences of motorized cross-country routes under this alternative, the combination of existing and potentially newly created trails still represent a small percentage of the land base. Increased use is not likely to change total detrimental conditions at the watershed or Forest scale over the 20 percent Forest Plan standard for soil productivity. However, the extent to which motorized cross-country routes associated with play areas on buttes and other topographic features outside of developed mineral sources (pits) detrimentally effects the soil resource on a localized basis could be extensive enough to exceed this standard in these areas due to the continued undesignated and concentrated use by motorized vehicles.

**Alternatives B-E**

All action alternatives prevent very similar effects associated with overall soil quality within the project area. They begin to place trails in areas that minimize potential for sediment contribution, away from homes, and avoid the most culturally-important places. New trail construction was minimized by using existing roads, user-created and snowmobile trails, and areas that have been previously disturbed from management activities. Routes used to connect areas were designed to be a loop trail. There are basically a range of 6-10 areas among the alternatives where a more concentrated trail system is designed to provide loops and connect to various play areas at mineral extraction pits. These areas connect to staging areas (strategically-placed parking areas) that offer various levels of amenities such as camping and bathrooms within the three subareas of Junction, Rivers, and Walker. The concentrated trail systems use existing Maintenance Level 2 roads to interconnect and provide access to communities such as the Crescent Lake area businesses, Two Rivers North subdivision, and Walker Rim. They also provide connections to provide the different riding opportunities that suit riders on ATVs, motorcycles, and 4-wheel drive vehicles.

*Activities associated with route designation (including new trail construction) and staging areas would have an overall beneficial effect to the soil resource by placing the trail in more ecologically suitable locations, allowing natural and management-induced processes to lower the overall footprint of detrimental soil conditions within the project area.*

An estimated increase visitation of 2.5-5.6 percent to the trail system over the next decade does not change these conclusions. This is because it is assumed the impacts associated with the designated trail system are largely confined to the tread of the trail and the prism of the roads; and Project Design Features including monitoring and maintenance have been incorporated to keep undesired effects contained within the routes. The trail system and staging areas and the overlapping land base are considered an irretrievable commitment of resources and have been factored into the analysis.

The following Table 45 displays the trail construction and restoration activities associated with the various alternatives. Restoration activities include fencing, soil decompaction, blocking (felling trees to obstruct passage), camouflaging, tree planting, and revegetation of native species. For more discussion on the restoration process and activities that would occur within riparian areas, reference the Aquatic Resources/Fisheries section in this Chapter. Approximately 56 percent of the project area is mapped as sensitive soils. Reference Project Design Features that address trail construction criteria in order to maintain water quality and potential erosion hazard.

**Table 45. Trail Construction and Restoration Activities Associated with Alternatives B-E**

| Alternative | Total Miles of Trail[38] | New Trail Construction (Miles) | Miles of User-created Trail Closed and Rehabilitated | Miles of Level II to Level 1 Road Closure | Miles of Construction in Mapped Sensitive Soils |
|---|---|---|---|---|---|
| B | 143 | 60 | 56 | 41 | 51 |
| C | 153 | 71 | 90 | 108 | 57 |
| D | 151 | 84 | 95 | 114 | 64 |
| E | 142 | 60 | 94 | 115 | 51 |

***Staging Areas***

The following table displays the number and type of staging area by alternative.

**Table 46. Type and Number of Staging Areas by Alternative**

| Alternative | Semi-Primitive[39] | Fully Developed |
|---|---|---|
| B | 2 | 2 |
| C | 3 | 6[40] |
| D | 3 | 2[41] |
| E | 3 | 2 |

All parking areas would have a bituminous surface (such as gravel from a weed free source) or asphalt surface applied to reduce dust and maintain the surface of the staging area. This would be considered an

[38] Includes user-created trails where appropriate, roads converted to trails, and new construction
[39] All alternatives include Junction Sno-Park which is considered semi-primitive
[40] Designated trail links to Simax, Crescent Creek, and Boundary Springs developed campgrounds
[41] Designated trail links to Simax developed campground in both Alternatives D and E

irretrievable commitment of resources. Fully developed areas are three to five acres, would include defined parking and camping areas, fire rings, self-contained bathrooms, and small "learner loop" areas where young riders can develop their riding skills under close supervision of the adults. Semi-primitive areas are one to two acres and would have no amenities such as a bathroom, picnic tables or fire rings. In Alternatives C and D, Walker South staging area (categorized as semi-developed) would include two to three acres for parking and would have a restroom. In Alternative C, Rivers North staging area would require additional clearing and irretrievable soil compaction of approximately one to four acres that be would dedicated to parking/staging/camping. Trail construction associated with all action alternatives directly affect soil resources as they would become permanently non-productive for growing vegetation from soil displacement, soil compaction, and continued OHV used in the tread of the trail. This is also considered an irretrievable commitment of resources.

Sites that are currently affected as a result of motorized cross-country routes that are not included in those miles identified for rehabilitation (Table 45) 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 experienced effects from motorized cross-country routes would have steady vegetative recovery after motorized vehicle traffic is removed. 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 effects from motorized cross-country routes.

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

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. 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.

Those miles of user-created trail that would be rehabilitated include fencing, soil decompaction, blocking (felling trees to obstruct passage), camouflaging, tree planting, and revegetation of native species. Timing of these activities would be dependent on funding, but would be prior or concurrent to new trail construction and route designation. In these areas, return of a vegetated condition would be immediately following completion of the soil decompaction activities (tillage). Tillage would loosen compacted soil layers and improve the soil's ability to supply nutrients, moisture, and air that support vegetative growth and biotic habitat for soil organisms.

In all activities, all river crossings are on existing system roads, except in Alternative C, where there is a new crossing proposed (see associated effects in the Hydrology section in this chapter). There would be no play areas on buttes, except where there are existing mineral sources (pits). The following Project Design Features and mitigation measures were designed and incorporated in order to maintain soil quality:

- In order to maintain soil quality and to ensure maintenance of a quality trail riding experience for the users, season of use would generally be from May 1 through October 31.

- Wherever possible, all trails would be located to overlay snowmobile trails, existing user-created trails, and/or areas where vegetation and soil may be previously disturbed.

- Except in Alternative C and the new proposed crossing, all other stream/riparian crossing would occur on existing Forest Service roads.

- All routes and staging area would be designed and located to minimize erosion and potential sedimentation with drainage systems designed for the appropriate location and maintained over time. They also would be well away from surface water to prevent potential contamination from hazardous materials.

- Minimize erosion for OHV routes by designing and maintaining proper drainage systems (Drain dips or water bars) with adequate spacing (30 to 200 feet depending on grade) especially on steep slopes or near water.

- Tread hardening systems (e.g. angular three inch diameter quarry rock), or materials and treatments that would achieve the same goal of protecting the tread would be installed wherever tread grade is less than two percent and water tends to pool.

- New trail segments would not be constructed directly up steep slopes. Sustained grades would not exceed 12 percent, and the maximum trail grade of any trail segment would not exceed 30 percent. This would reduce the capacity of the trail to capture and channel runoff.

- All trail construction in or near wet areas would be avoided, wherever possible. When unavoidable, install wooden puncheons (an artificial tread elevated above the ground) across wet or swampy areas.

- Downed wood cleared to create the trail tread would remain onsite and positioned to discourage OHV users from straying off the designated trail tread.

- Very little trail construction would occur within riparian reserves. However, when unavoidable, all existing large woody debris would be retained within riparian reserves to provide nutrients and food to aquatic plants and insects, and provide terrestrial buffering to retard sediment-rich runoff from entering the stream network.

- All rehabilitation work areas would be revegetated with native species following disturbance. Erosion filtering fencing would be placed to control offsite movement of soils in rehabilitation areas adjacent to perennial streams.

- Wood fencing or other similar structures would be used to contain the area of activity at Muttonchop Butte and retain the current vegetation.

These design features have been routinely used on the forest and are currently being used at other newly-designated OHV trail systems (such as Santiam Pass Summer Motorized Recreational Area) with effective results.

In addition, when a designated motorized trail overlaps a timber sale unit that has been completed within the last 20 years, monitoring would occur. Twenty years was chosen as the timeframe because over 30 percent of the area has returned to a vegetative state and if soil restoration activities such as decompaction (subsoiling) was applied following completion of the timber sale, soil properties have returned to nearly

complete pre-disturbance function. In those harvest units that were detrimentally affected and no restoration activities were initiated, natural processes such as freeze-thaw, rooting, and ground burrowing mechanisms have likely allowed them to be productive once again.

If the trail and the residue effects of the harvest unit combine to cause a cumulative soil condition less than 80 percent in a productive state, avoidance or restoration techniques such as soil decompaction would be utilized to be consistent with Regional and Forest-wide Standards and Guidelines.

Soil restoration (subsoiling) may be used to mitigate Forest and Regional thresholds for soil quality. It has been implemented on the Crescent Ranger District and across the Deschutes National Forest with success due to the absence of rock fragments on the surface and within soil profiles. Most surface organic matter remains in place because the equipment is designed to pick up the soil and drop it in the same place to loosen the compacted soils. The tines are adequately separated and have enough clearance between the tool bar and the ground, thereby allowing smaller slash materials to pass through without building up. Mixing of soil and organic matter does not cause detrimental soil displacement because these materials are not removed off-site. Restoration treatments likely improve subsurface habitat by restoring the soils ability to supply nutrients, moisture, and air that support soil microorganisms. Since the winged subsoiler produces nearly complete loosening of compacted soil layers without causing substantial displacement, subsoiled areas are expected to reach full recovery within the short-term (less than five years) through natural recovery processes.

Research studies on the Deschutes National Forest have shown that the composition of the soil biota populations and distribution rebounds back toward pre-impact conditions following subsoiling treatments on compacted skid trail and landings.

Subsoiling sets up the conditions so that the soil can rehabilitate at an accelerated rate. The winged subsoiling equipment used on the Deschutes National Forest lifts and fractures compacted sub-surface soil layers in greater than 90 percent of the compacted zone with one equipment pass (Craigg 2000). Subsoiling directly fractures compacted soil particles and increases macropore space within the soil profile, both of which contribute to increased water infiltration and enhanced vegetative root development. Soil compaction associated with harvest operations may disrupt mycorrhizal connectivity; subsequent subsoiling to break up the compaction may enhance new host plant root growth and mycorrhiza (Luoma, unpublished report, Diamond Lake Ranger District, 2007) or may disturb the existing mycorrhizal network (Abbott, pers. comm. 2007). Although subsoiling does not completely return these areas to pre-impact conditions, it considerably rectifies physical properties to a condition where other soil processes can recover on site. Subsoiling is very effective in reducing soil strengths incurred by the compression and vibration effects of machine traffic. Soil probes taken before and after subsoiling operations show reductions to or below natural levels after a single pass of the implement. Following subsoiling, soils can be very fluffed, and returned to natural bulk density levels after a year or two of physical settling and moisture percolation through the soil profile (Deschutes Soil Monitoring, 1995 through 2001).

Trail construction would overlap approximately 51 miles of mapped sensitive soils. Figure 23 displays the scope of the trail system overlaying sensitive soils within the project area. Many routes on existing roads traverse sensitive soils. The classification as “Sensitive” does not preclude the presence of roads and trails, it is used as an informative tool for proper location and construction techniques.

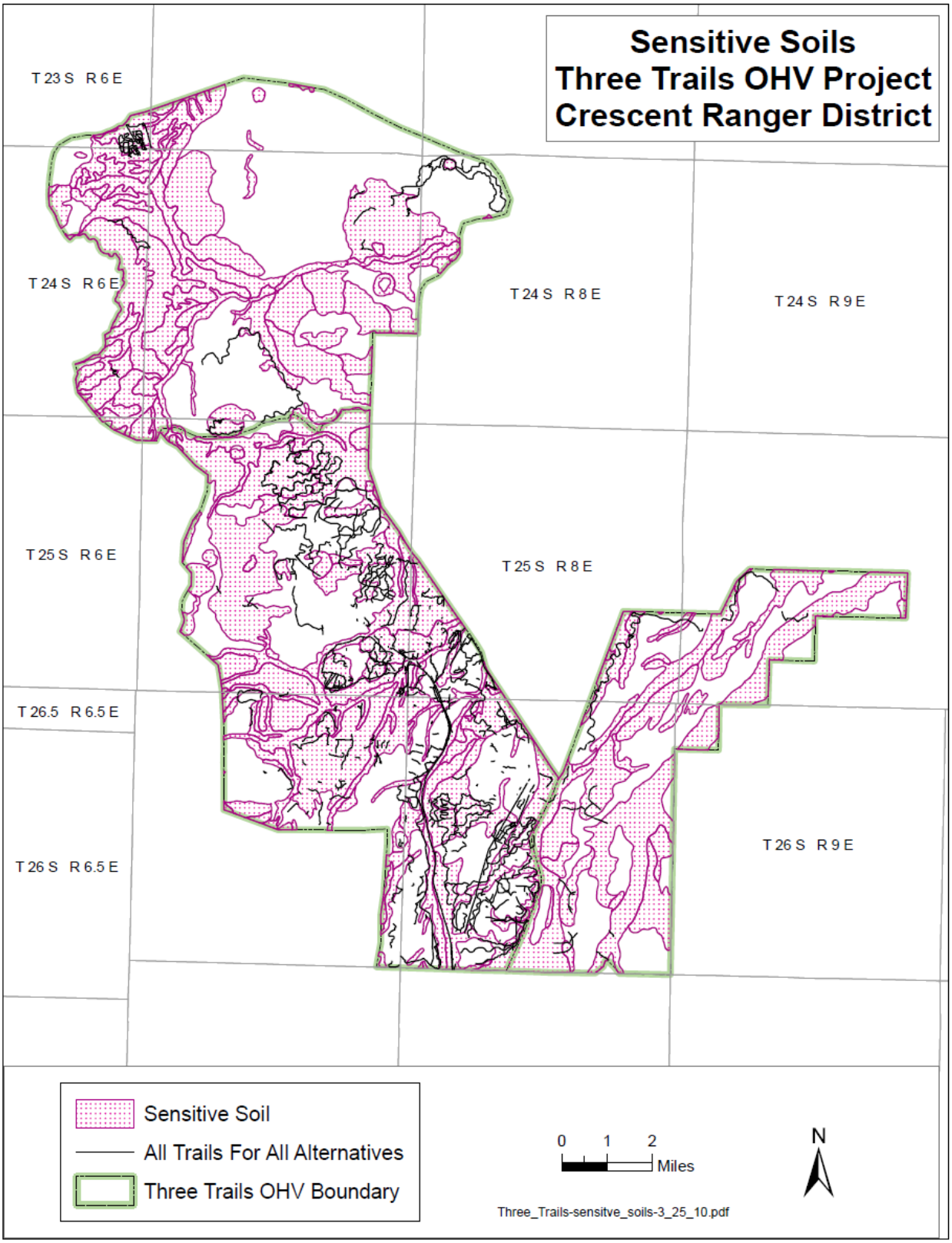


**Figure 23. Sensitive Soils Overlaid by Proposed Trails in Three Trails OHV Analysis Area**

Of the categories of sensitive soils (e.g. slopes greater than 30 percent and loose sandy soils susceptible to soil displacement, very low productivity due to frost heaving with low fertility, seasonal high water tables, and high or extreme erosion hazard), the greatest amount of mapped sensitive soils are those associated with a high water table. Project design has avoided slopes greater than 30 percent, thus sandy soils susceptible to soil displacement are confined to the footprint of the trail system itself. Continual trail maintenance is also a design of this project and soil material that has been displaced to the sides of the trails would be redistributed back into the trail as a routine operation. Soils mapped as "Sensitive" for low productivity are primarily associated with vegetative management and not trail construction, as vegetation would be removed for the life of the trail system. Those soils associated with a high water table and/or extreme erosion hazard would be field-checked on a site-specific basis during times most likely to present those conditions. If found, Project Design Features of avoidance and/or trail tread elevation would reduce potential affects to water quality. For more discussion, reference the Aquatic Resources/Fisheries section in this Chapter for more details.

**Cumulative Effects**

The Rim-Paunina project strives to develop a more appropriate range of vegetative conditions and wildlife habitats overlaps the Walker segment of the project area. It proposes approximately 10,000 acres of thinning and 13,000 acres of prescribed burning. As implementation of this decision would be made prior to the decision for Rim-Paunina, Forest Plan Standards and Guidelines for the Forest Plan would guide soil quality in the area. Where parts of this trail system may overlap potential activity units, monitoring and (if needed) soil restoration activities would maintain 80 percent of the area in a productive state.

Table 11 which lists potential past, present, and foreseeable actions that may overlap the Three Trails OHV project area was reviewed. There are no other additive effects identified above those discussed for overlapping harvest activities, roads and trails, grazing, and recreation in the Affected Environment and Direct/Indirect Effects discussions of this document.

The scope of the analysis has defined an activity area as the most logical zone of influence (LRMP, p. 4-70 and 71, Table 4-30, Footnote #1). Past and present actions have been discussed within the context of the existing condition because that is the most informative place. Past and present timber sales have been included in the existing condition using the Forest Activity Tracking System (FACTS) database.

# Wildlife

**Introduction to Wildlife Effects**

The following specialist reports for wildlife sections, Threatened, Endangered and Sensitive Species (TES), Management Indicator Species (MIS), Birds of Conservation Concern (BCC), Big Game, and Rare and Uncommon, have been incorporated in their entirety. The Zone of Influence for discussion on effects is bounded by the project area and its overlap with existing detrimental conditions such as roads, trails, and past management activities. Effects of recreational OHV use on wildlife may 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 animals such as the gray squirrel and woodchuck that stay closer to shelter can tolerate closer encounters because they can quickly escape (Frid and Dill 2002; Gill et al. 1996) while another study found geese consumed less and spent less time in quality habitat near human activity (Gill et al. 1996).

Not all species respond negatively to human development and use of OHV trails and roads. Openings, shrubs, and grasses may develop alongside roads providing additional foraging habitats. Cleared roads and trails are utilized as travel corridors for some species. Benefits are related to habitat, mobility, and food resources.

General effects are discussed in this section. General effects cover broad categories of species and those effects are common to all alternatives including the no action alternative.

**General Effects Common to all Alternatives**

Roads eliminate habitat with initial construction and thereafter alter the quality of habitat adjacent to them. This is primarily as a result of the edge habitat created, vegetation trampling, and sound related to people and or vehicles. 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). While there is no road construction proposed, there are ongoing effects of existing roads, and the effects of existing and proposed OHV trails are similar.

Road widths vary from 14 to 35 feet depending on single or double lane and maintenance of right of way. For trails, effects are less with alteration of habitat as motorcycle trails can be up to two feet wide; ATV trails up to four feet; and four-wheel-drive trails up to seven feet wide. Disturbances from noise on roads and trails emanates out from the vehicle and is treated the same regardless of width.

Effects include altered reproductive success, mortality, or loss of habitat due to:

- Access for predators and uncommon wildlife
- Fragmentation
- Behavioral changes
- Noise

**Access for predators and uncommon wildlife**

Roads may act as barriers for some species but may aid in the dispersal of other native and non-native species. Pocket gophers and meadow voles were able to extend their range due to conditions created alongside highways (Forman et al 2003). Brown-headed cowbirds are attracted to trails giving them easier access to those nests near trails or roads (Hickman 1990). Studies have found predation rates increase with decreasing distance to trails by ravens, domestic dogs, mice, squirrels, skunks, and coyotes (Miller and Hobbs 2000; Miller et al. 1998). On the Crescent Ranger District, these

species have been seen on roads and user-created trails (C.Rosterolla, pers. comm. wildlife biologist on the Crescent Ranger District).

Roads and trails provide greater access to habitats previously not accessed (Forman et al. 2003). There is increased human access and contact with animals resulting in intentional or accidental killing, such as, increased access for falconers to remove young raptors from nests (Erdman et al. 1998 in Gaines et al. 2003). Increased contact can result in death due to intentional or accidental killing from hunting, trapping, and poaching (Cole et al. 1997; pers. comm. ODFW; Gaines et al. 2003), resulting in increased vulnerability of species like fisher and overharvest of marten, deer, and elk.

Edge effect from roads and trails may also increase predation access to songbird nests. Studies found an increase in predators attracted to the corridors and the adjacent forest interior on trails and roads 7 to 26 feet wide (Rich et al. 1994 in Ouren et al. 2007; Hickman 1990). In addition, open areas such as junctions, play areas, campgrounds, and staging areas have perches and a clear view of surrounding areas can be a factor in higher nest predation (Ratti and Reese 1988 in Paton 1994).

Adjacent roads and trails provide travel corridors into forested habitat from nearby areas (Small and Hunter 1988; Askins 1994 in Joslin and Youmans 1999). Predators such as great gray owls and red-tail hawk take advantage of forest edge. Roads and 4-wheel drive trails potentially provide additional edge nesting habitat for these species. Indirect effects of fragmented habitat or edge-created habitat would include competition with other predators, such as Goshawk, Coopers hawk, and northern spotted owls. In the case of the northern spotted owl, the main predator of this species is the great gray owl (Paton et al. 1991).

**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 Joslin and Youmans 1999; Reed et al. 1996). Habitat fragmentation from corridors (roads and 4-wheel-drive trails) reduces a species capacity by disrupting continuous forest cover and reducing space needed by interior species. Hickman (1990 in Joslin and Youmans 1999) found similar results as Hutto on trails two to three meters (7-10 feet) wide. Patch size and distribution can determine the probability that a patch may be occupied (Laan and Verboom 1990; Fahrig 1998). Hutto (1995) found that some songbirds may occur less commonly in smaller forest patches than in larger forest patches.

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. Songbirds, such as the brown creeper and dark-eyed junco, utilizing both the riparian and upslope forested habitat (McGarigal and McComb 1992) used habitats more effectively when they were connected (Hutto 1995).

Road and trail edges may serve as ecological traps (Andrews 1990 in Ouren et al. 2007; Kokko and Sutherlan 2001) for some species. These areas may have the necessary resources for species to live and potentially reproduce 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 road and trail sides contain suitable habitat, these individuals are at greater risk of mortality of being hit by vehicles or predation (Brooks and Lair 2005; Mumme et al. 2000 in Ouren et al. 2007; Yahner et al. 1979 in Ouren et al. 2007; Kokko and Sutherland 2001). In the Three Trails OHV project area, it is more likely effects of increased predation would apply than being hit by an OHV because prey are more likely to hear a motorized vehicle approaching and move out of the way versus avoiding the

stealth and lethality of a predator. Also, the speed and size of OHVs (which are most likely to be the type of motor vehicle they encounter) are less lethal than cars and trucks.

**Behavioral changes**

The immediate behavioral responses of wildlife to recreation (e.g. flush response, alert, flight distances, and distances moved) have conventionally been used to compare the degree of disturbance presented by different activities (Taylor and Knight 2003). Frid and Dill (2002) suggested human-caused disturbance (e.g. walking, motorized vehicles, wildlife viewing) is a form of predation risk, in that animals respond to human activities in the same way they might respond to their predators, for example, when something approaches rapidly and directly. People approaching wildlife on a direct line, straight towards them, produces an increase in flight response (Bennett and Zuelke 1999; Klein et al. 1995). In addition, if the recreationist is off-trail and is coming straight at the wildlife, they have a much stronger tendency to flee (Knight and Cole 1995; Taylor and Knight 2003).

The stress of a flight response in any animal can cause physiological changes. Gabrielsen and Smith (in Knight 1995) listed the physiological changes mammals and birds experience as increases in heart rate, oxygen consumption, metabolism, respiratory rate, blood flow, body temperature, and blood sugar while decreasing blood flow to skin and digestive organs. These types of energy expenditures can reduce vigor and decrease energy. For example, when animals, such as rabbits and squirrels, encounter their predator, they can no longer consume energy; instead they begin to expel it to enhance physiological changes associated with survival.

One major short-term or immediate stress response of wildlife to recreation is a change in behavior. Some behavior changes include the stopping of foraging until the disturbances ceases, fleeing, or flushing, changes in physiological processes (like those previously described), abandoning nests, or stopping mating calls (Knight and Cole 1995; Taylor and Knight 2003).

If the above responses are experienced over a period of time, they become long-term disturbances. Long-term disturbances can reduce overall vigor and energy. Wildlife may change their habits, including reproductive behaviors, foraging habitats, food consumption, food source abandonment of preferred foraging areas, and home ranges (Klien 1971; Knight and Cole 1995).

**Noise**

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):

- Altered behaviors
- Hearing loss and decreased sound sensitivity
- Communication confusion
- Increase in stress hormones

The impacts of these effects may include reduced reproductive success, mortality, and/or reduced habitat quality or habitat loss (AMEC 2005). 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 101.1 dBs and higher (http://www.fs.fed.us/r6/centraloregon/recreation/cohvops/sound.shtml). In Oregon there is a state law of 99 dBs maximum (at 20 inches from the muffler) on all OHVs (http://www.nohvcc.org/IMAGES/ohvregs.htm ). This decibel range as dictated by Oregon State law was the basis for the following effects analysis related to noise.

***Altered Behaviors***
Similar to behavior changes to recreational activities, there are behavior responses to noise. Responses can be mild, (wariness, walking slowly away, freezing, or crouching), moderate (running away, hiding in dens or burrows, flying short distances) to intense (panic flight, urinating or defecatin, and running at high speeds). These behaviors interrupt foraging, nurturing young, and in the case of panic responses can lead to injury or death (Bowles in Knight 1995). Burger and Gochfeld (1998 pages 151, 220, 222 and 223) found shorebirds' foraging time decreased and avoidance of disturbance increased within 100 m (328 ft). Various mammal studies have shown mammals may leave an area where noise is, but return at some point once the noise is gone (Bowles in Knight 1995).

***Hearing loss and decrease in sound sensitivity***
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 vary from partial deafness to hormonal stress responses. Research on reptiles and rodents found exposure to simulations of dune buggies sound resulted in hearing loss for weeks after and unresponsiveness to predator sounds (Brattstrom and Bondello 1983 in Ouren et al. 2007).

Researchers have measured deafening noise levels in songbirds (Marler et al. 1973; Konishi 1969). The study concluded the birds became partially deaf, by losing part of their normal hearing range. They could still hear parts of songs and could mimic other male's song, therefore the songs or ability to hear their specific songs were not as affected.

Marler et al. (1973) used a sound pressure of 95-100 dB which represents many OHV sound levels, (e.g. two stroke engines 70-101 dB, four stroke engines 60 dBs, ATVs 78dB, and snowmobiles 75dB). The noise level of 99 dB (highest allowed in Oregon) would be loud enough, to create partial deafness in canaries and songbirds (Marler et al. 1973; Konishi 1969). Wildlife within the Three Trails OHV project would not experience this noise level at a constant rate, nor would they receive the sound levels 20 cm away. It is more probable wildlife would experience intermittent sound levels of 99 dB, with a rare occasion of illegal engine reaching above 99 dB, much farther away than 20 cm. So, while deafness is unlikely there would be a decreased sensitivity. 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). 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). Klump et al. (1986) study showed how the great tit can hear the sparrow hawk (American Kestrel) coming and gives one of three alarm calls to warn others of the presence of sparrow hawks. Communication between the species fails if frequency noise masks either the noise produced from the sparrow hawk or the alarm call. Reijen and Foppen (1994) stated that where the primary song was affected by vehicle disturbance, birds appeared reluctant to establish nesting territories. This could have severe effects to populations whose numbers are already low (AMEC 2005). Konish (1970) found all birds could hear frequencies below 1 kHz, which may be used to detect low broad-band noises by predators. Vehicle noise may indirectly cause mortality by eliminating a species' ability to detect and capture necessary food items and detect and avoid predators (Joslin and Youmans 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 inappropriate responses. 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).

***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; 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; Joslin and Youmans 1999; Gaines et al. 2003; and Ouren et al. 2007).

Many studies show breeding birds near highways and OHV trails have reduced densities, population decline and/or are more likely to abandon their nest (Forman et al. 2003; Barton and Holmes 2007; Joslin and Youmans 1999; Kaseloo 2006; Zande et al.1980; Reijnen et al. 1995; Reijnen and Foppen 1994). Depending on the species the amount of habitat lost due to noise varies.

***Habituation***

Some animals do show the ability to adapt to noise. Flushing distance may decrease, avoidance distances may decrease, and individual wildlife may learn to ignore the sound (Bennett and Zurlke 1999; Zande et al. 1980; Dorrance et al. 1975; Richins and Lavigne 1978; Moen at al. 1982 in Zielinske et al. 2007). Additionally, some songbirds can become habituated to certain people visiting their nest sites and may become aggressive to others that have not (Knight and Temple 1995).

Whittaker and Knight (1999) stated that animals may become habituated to trail recreation because the movement is always occurring on a certain line of travel continually. Their study illustrated an animal's probability of flushing due to recreation increased when the activity was off-trail verse on-trail. Other studies have shown animals are also more prone to habituate to trail activities versus those activities that are unpredictable (MacAurthur et al. 1982; Miller et al. 2001). The energetic cost for wildlife of responding to disturbances from recreation can also affect the carrying capacity of wildlife habitat (Stalmaster 1983). In some cases, wildlife may habituate to predictable disturbance from recreation, but in other cases they may not (Taylor and Knight 2003). In MacAurthur et al. (1982) white-tail deer did not habituate to pedestrians and snowmobiles. However, habituation may lead to attraction, which could have wildlife consequences. For example, habituated wildlife may become prone to negative human activities like poaching and hunting (Singer 1975) due to baiting practices.

**Undisturbed or Disturbed Habitat**

The degree to which the effects discussed apply is related to the scale at which they occur and the tolerance of the species to the effects. Reducing one acre of habitat for a species that has a large home range and large quantities of habitat available would have very little impact, if any, on that species. Reducing one acre of habitat on a species that is not mobile and has a three acre home range may eliminate that individual's ability to successfully reproduce or even survive. Research results from one species may or may not apply to a similar species upon which no research has been done. In analysis of the specific species, unless there is conflicting research that indicates otherwise, findings are applied from one species to the same family of species. A songbird not studied would have the same reaction to sounds as a particular songbird in a given study. In this way effects are not under estimated, but may be overestimated.

Three Trails OHV project does not propose to construct any new roads. Proposed trail construction would utilize roads, user-created trails, fire lines, snowmobile trails, and other areas disturbed from

management activities wherever possible. Through the action alternatives, OHV use would only be allowed on designated trails, routes, shared use roads and/ or play areas, and would no longer permit user-created trails. Within each action alternative, there is a proposal to decrease habitat disturbance by closing and rehabilitating user-created trails, closing roads, and converting roads into trails (see Table 47).

**Table 47. Comparison of Alternative Actions**

| Alternative | Existing Miles of Open Road | Miles of User-created Trails Closed and Rehabilitated | Miles of Roads Proposed to be Closed (Maintenance Level 2 to 1) | Miles of Roads Converted into Trails | Miles of Trails (user-created or new construction)[42] |
|---|---|---|---|---|---|
| A | 956 | 0 | 0 | 0 | 130 |
| B | 550 | 56 | 41 | 12 | 131 |
| C | 494 | 90 | 108 | 53 | 100 |
| D | 491 | 95 | 114 | 43 | 108 |
| E | 496 | 94 | 115 | 43 | 99 |

For the specific species analyses that follow, disturbances are quantified by habitat and the roads zone of influence. How habitats are defined and disturbed habitats determined is detailed in the following section.

**Methods/Assumptions Used In the Wildlife Effects Analysis**

**Scientific Literature Review**

Relevant, recent literature was reviewed on the effects of both motorized and non-motorized use of roads on wildlife. However, literature is not available for all species or types of conditions found on the Crescent Ranger District. Much of the information used came from Forman et al. (2003), Gaines et al. (2003), AMEC (2005), Joslin and Youmans (1999), and Ouren et al. (2007). The Forman et al. (2003) publication dealt primarily with highly traveled, paved roads. Most district roads are not paved nor utilized to the extent that paved roads are. Speeds are also much slower on forest roads than paved roads and use varies widely across the district with some roads rarely utilized. It would be noted where effects may be overstated due to the difference in circumstances.

Ouren et al. (2007), Gaines et al. (2003), and Joslin and Youmans (1999) are all literature reviews or bibliographies conducted on the effects of recreation and off-highway vehicle or linear route impacts on wildlife species and habitat. The AMEC (2005) publication provided information on the effects of noise on wildlife. From the review of literature, it was determined that disturbance from roads has impacts on most wildlife species. Therefore, effects to species would be analyzed and measured by acres of disturbed and undisturbed habitat.

Motor vehicle access to Crescent District roads is generally subject to the amount of snowpack and rate of melt in the spring and onset of snow during the fall and early winter. Driving access is usually open sooner on the eastern half of the district as compared to the western half because of reduced snow pack. Snowplowing of the Cascade Lakes Highway is conducted by Klamath and Deschutes County road crews. The Crescent District conducts very little snowplowing unless needed for contract implementation. Road use within the Three Trails OHV project area varies considerably. East of Highway 97 road use would be described as low until late August when big game archery season starts

[42] No new construction would occur in Alternative A.

and higher use occurs into September and October with modern rifle big game seasons and the matsutake mushroom harvest season ending in early November. West of Highway 97, the presence of lakes, streams, and campgrounds result in more recreational activity and greater use of the existing road and trail systems during the spring, summer and fall months.

**Road Effect Distance (200 meter buffer)**
Literature was reviewed to determine at what distance from roads impacts are seen relative to disturbance and edge effects. Noss and Cooperrider (1994) report edge effects are not linear and the zone varies in width depending on what is being measured. They report edge effects seen as far as 240 meters. Forman (2000) described a "road effect distance" of 200 meters (660 feet) for secondary roads to calculate the indirect loss of habitat and the displacement of many species. Forman also mentions the road effect zone is highly variable and is dependent on the species affected, adjacent habitat, road type, and traffic volume. Therefore, the 200 meter road effect distance would be used to assess edge effects as well. This distance may over-estimate effects for some species and would under-estimate effects for others. However, this distance captures known effects for many species and provides a relevant measure of change between the existing condition and the alternatives. The analysis would also assume a 200 meter affected distance for all motorized trails proposed as part of the Three Trails OHV system. It is assumed that the 200 meter road effect distance would also include those effects for motorized access for dispersed camping. Vehicles accessing dispersed campsites are usually traveling at a very low rate of speed for short distance (no more than 300 feet). Engines are only on for short periods of time and therefore, effects realized for the 200 meter road effect zone would include those for motorized access for dispersed camping as well. This 200 meter road effect distance would be referred to as disturbed habitat in the analysis.

**Change in Noise and Disturbance**
Noise disturbance from vehicle use on roads and the associated fragmentation (edge effect) are primary effects to wildlife species and habitat. These effects affect the quality of habitat and species use adjacent to roads. Effects to a variety of species have been documented in the literature, many of which do not occur on the Deschutes National Forest. Data is not available for all species or conditions found on our forests. Therefore, based on professional judgment and local knowledge of the species, we assume that species in the same family would experience similar effects.

Disturbance would continue within the road effect zone (200 meters each side of roads or motorized trails) for the OHV travel system described in each alternative. Decreased habitat quality, reduced reproductive potential, and avoidance of the road effect zone are potential effects as a result of habitat alteration physically or due to disturbance.

Disturbance would decrease beyond the road or motorized trail effect zone for each of the action alternatives and as a result, habitat quality would increase.

Increase use of a road or trail does not increase the size of the disturbance zone on that road or trail. There may be more use of a disturbance zone by wildlife when there is only occasional use of the road or trail. The effects are determined by available research which may or may not include numbers of users. Where those numbers are known, they are included in the analysis; where those numbers are not know, the effects are considered to occur when use is open to the public regardless of the amount of traffic on the road or trail. Effects to wildlife of administrative use of closed roads or where roads are open for projects are covered under cumulative effects.

**Mortality**
Because all action alternatives propose a combination of road closures to compensate for new motorized trails, overall combined motorized densities would decline across the analysis area. It is assumed animal mortality rates would be similar to what currently exists although data is lacking on most species. Big

game mortality data however, has been collected on Highway 97 including highway segments within the project area (reference effects to Big Game in this Chapter).

**Closed, Open and High Impact Areas**
Until the Travel Management Rule is implemented, there are currently few restrictions to cross-country travel across the district except in designated areas (e.g. wilderness, research natural areas, fire areas, green dot areas). These designated areas have closure orders that prohibit cross-country travel and are classified as closed on the maps and in the analysis. In closed areas, just those acres associated with roads and the road effect distance (200 meter buffer either side of open roads) were considered disturbed and/or of decreased habitat quality. Because all action alternatives close the project area to cross-country travel, acres of disturbed habitat would be measured on only those roads and motorized trails that are open to the public for motorized use. Closed roads have administrative use allowed and are occasionally utilized for access if they are not physically closed and are safe for travel. In many cases, the timing of the physical closure of these roads is dependent upon completion of post-sale activities. This use is highly variable in any given year from short-term daily use for a vegetation management project to years of inactivity. Because of the variability and high degree of inactivity these roads are not included in the disturbed habitat analysis, but considered in cumulative effects.

**Habitat Analysis, Viable Ecosystems Model, Geographic Information System**
Habitat for the various species was determined by the Viable Ecosystems Model (Viable). The Geographic Information System (GIS) program ArcMap was used to overlay this habitat with the road effect distance to determine and illustrate the amount of habitat that is likely to be disturbed and of decreased habitat quality for most species. Undisturbed habitat would therefore, occur more than 200 meters from open roads and motorized trails outside identified buffers.

**Viable Ecosystems Model**
The Ochoco and Deschutes Viable Ecosystems Management Guide (VEMG) was developed to classify vegetation on a landscape basis. "The Viable Ecosystem model provides a process to apply ecosystem management concepts to project level planning. This system compares existing vegetation with site potential. The model focuses on relationships between combinations of vegetation structure and species composition, and habitat requirements for animals, insects, and plants. Viable Ecosystems is a useful tool for cumulative effects analysis of broad scale changes in vegetation at a subwatershed to Forest-wide scale and subsequent changes in animal, insect, or plant communities."

Viable stratifies the environment along a gradient of size, structure, species composition, and relative tree density. The various classifications are then linked to wildlife habitat requirements. For example, a classification with a value of 5615**2** is white fir (56), early seral (1), medium/large structure (5), and **low density (2)** and would typically have a single story (low density) dominated by ponderosa pine (early seral in white fir) 21" diameter or greater (medium/large structure). This provides nesting habitat for white-headed woodpeckers. A value of 5635**1** would equate to white fir (56), late seral (3), medium/large structure (5), and **high density (1)** and would be a multi-storied stand dominated by white fir 21" diameter or greater and provide habitat for pileated woodpeckers. All values that provide habitat for species were used. In addition to the mixed conifer value of 56152 using the white-headed woodpecker example, any seral stage dominated by ponderosa pine, medium/large structure, and low density would provide similar open ponderosa pine habitat and was used in determining amounts of white-headed woodpecker habitat across the Deschutes National Forest.

The 2004 satellite imagery layer was used to develop the Viable map. Data is mapped on a 25 meter pixel grid, meaning the map is divided up on a 25 meter grid and that every 25 meter square (pixel) is assigned a value (i.e. 56351) that relates to a stratum of size, structure, tree species composition, and relative tree density. Criteria used (vegetation, seral state, structure, and density) to determine habitat for

each species is described in the existing condition of each species. No major vegetation projects have taken place since 2004. Existing conditions include past actions such as timber sales which used the Forest "FACTS" database. Presenting information in this way and including those current and foreseeable future actions in cumulative effects is the most informative for the decision maker.

**GIS Analysis 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. The client software developed by Economic and Social Research Institute (ESRI) was used for the processing and presentation of GIS data.

**Northern Spotted Owl**

The analysis conducted for the northern spotted owl includes Nesting, Roosting, and Foraging (NRF) habitat using the definition of habitat as defined in the 2006-2009 Deschutes and Ochoco Programmatic Biological Assessment which reflects the most current situation. There are two different versions of Critical Habitat. On August 13, 2008, the United States Fish and Wildlife Service (USFWS) announced a revised Designation of critical habitat for the northern spotted owl (Federal Register Vol 73, No 157, August 13, 2008). Historic CHU refers to the areas identified in the 1992 Critical Habitat Rule. Both versions are being analyzed.

**Deer and Elk Habitat**

The Deschutes Forest Plan defines suitable deer hiding cover as one of the following:

a) six acres or larger capable of hiding 90 percent of a standing adult deer from view of a human at a distance of 200 feet, or
b) six acres or larger with an average height of six feet and which has not been thinned in 15 years, or
c) residual clumps of one half acre or larger stands within units with advanced regeneration (trees including small trees up to seven inches in diameter) and at least 12 greater than seven inch trees per acre remaining after harvest (LRMP, WL-54, p. 4-58). Residual clumps less than six acres in size were not modeled which likely under-represents the amount of hiding cover present in the subwatershed analysis.

Suitable elk hiding cover is similar:

a) being six acres or larger capable of hiding 90 percent of a standing adult elk from view of a human at a distance of 200 feet, or
b) six acres or larger with an average height of 10 feet and which has not been thinned in 20 years, or residual clumps of two acres, or
c) larger stands within units with advanced regeneration (trees including whips up to seven inches in diameter) and at least 12 greater than seven inch trees per acre remaining after harvest (LRMP, WL-47, p.4-57).

Elk thermal cover must be in blocks at least 10 acres in size and have an average height of at least 40 feet with a minimum canopy cover of 40 percent (LRMP, WL-50, p.4-57). This standard only applies within Key Elk areas designated by the Forest Plan.

To be conservative, hiding cover for both species was modeled using Gradient Nearest Neighbor (GNN) with the criteria of hiding 90 percent of a standing adult elk from view of a human at a distance of 200 feet. This condition was modeled using trees with a density of at least 469 trees/hectare (190 trees/acre or a tree every 15 ft) with a diameter of 3-25 cm (1-10 in) and at least two meters (7 ft) tall across the 80,000

acre planning area. Fields containing this data in GNN and the definitions from the data dictionary include:

- TPH_3_25 – Density of live trees 2.5-25 cm dbh in trees/hectare.
- STNDHGT – Stand height, computed as average of heights of all dominant and codominant trees in meters.

Thermal cover for the Key Elk area was modeled using GNN with the criteria of at least 40 percent canopy cover and tree height of at least 12.2 meters (40 feet) across the planning area and clipped to the Key Elk area. Fields containing this data in GNN and the definitions from the data dictionary include:

- CANCOV – Canopy cover of all live trees; calculated using methods in the Forest Vegetation simulator.
- STNDHGT – Stand height, computed as average of heights of all dominant and codominant trees.

LEMMA Data Dictionary: **http://www.fsl.orst.edu/lemma/common/dataDictionary.php**

An important finding from the Starkey Experimental Forest and Range studies is that road (or route) density is not the best predictor of habitat effectiveness for elk. Instead a model based on distance bands proved to be a more spatially explicit and biologically meaningful tool for assessing effects from roads. Road densities do not provide a spatial depiction of how roads are distributed on the landscape (Rowland 2005). Consequently, a distance banding analysis was conducted on the 93,016 acre project area. Open motorized routes (roads and trails) were buffered at three scales to display the amount of National Forest acreage within the buffers. The three distance bands applied included: a) acres and percent of the project area within 660 feet of open motorized routes, b) acres and percent of the project area greater than ½ mile from an open motorized route, and c) acres and percent of the project area greater than one mile from an open motorized route. Hillis et al. (1991) defined elk security habitat for forested stands greater than 250 acres in size and greater than ½ mile from an open route. Rowland et al. (2000) determined that the distance of 1,969 yards (1,800 meters) is equivalent to that at which elk response to open roads diminished markedly. Therefore, acreage greater than one mile from an open motorized route is assumed to provide greater security habitat for elk than the ½ mile distance.

**Species Analysis**

Sensitive species were analyzed using the 2008 update to the R6 Regional Forester's Sensitive Species list. Management Indicator Species (MIS) were analyzed for those identified in the Deschutes National Forest Land and Resource Management Plan (LRMP). Surveys were not conducted for this project. Recent surveys for overlapping projects (BLT, Rim-Paunina), in addition to historical data, were used in determination of species occupancy within the Three Trails OHV project area. Incidental species observations have also contributed to the knowledge of species presence within the project area and/or Crescent District. Potentially suitable habitat is considered to be occupied unless surveys or incidental observations have not detected the species.

The information used for habitat definitions and trend analysis of species is from the best available research found in books, scientific journals, and scientific websites. One major contributor for population trend data is NatureServe, an international non-profit conservation organization whose mission is to provide the scientific basis for effective conservation action. NatureServe and its network of natural heritage programs, including Oregon State Heritage Program, are the leading source for information about rare and endangered species and threatened ecosystems. Their website, http://www.natureserve.org/, compiles historic and current information from The Nature Conservancy and other conservation groups, US government agencies, private sector partnerships, international agencies and data cooperators.

**Evaluation Criteria and Comparison Measures**
Evaluation criteria are developed to illustrate the effects to wildlife and how those effects differ by alternative. In this analysis, disturbance is a major effect of roads and motorized trails on habitat quality, quantity, and species life needs. Using the same units of measure allows the major impacts to be easily understood and compared, providing the Decision Maker the necessary data to make an informed decision.

**Units of Measure**
Suitable habitat for each wildlife species analyzed in this document has been affected across the project area primarily by noise disturbance and fragmentation of habitat. The following measure would be used to evaluate the impacts and associated effects of the planned activities:

1. The acres of potential suitable habitat as calculated by Viable located outside the disturbed road effect zone (200 meters either side of the road), otherwise known as undisturbed habitat.

**Analysis**
An analysis was conducted for each species to calculate the acres of undisturbed and disturbed habitat by alternative. Potentially suitable habitat was overlaid with areas open or closed to travel off designated routes to determine the number of acres occurring in each category by alternative.

**Other Assumptions**
Comments from the public for the Three Trails OHV project indicate they utilize Maintenance Level 1 National Forest System roads (closed and no maintenance performed) as part of their riding experience. Consequently, for the purposes of analyzing the existing condition, all roads including Maintenance Level 1, are assumed to be open and experiencing some level of motorized use.

Increase use of a road or trail does not increase the size of the disturbance zone on that road or trail. There may be more use of a disturbance zone by wildlife when there is only occasional use of the road or trail. The effects are determined by available research which may or may not include numbers of users. Where those numbers are known, they are included in the analysis; where those numbers are not know, the effects are considered to occur when use is open to the public regardless of the amount of traffic on the road or trail. Effects of administrative use, where roads are open for projects are covered under cumulative effects.

## Threatened, Endangered and Sensitive Species

A Biological Assessment (BA) has been prepared and is on file at the Crescent Ranger District. Informal consultation with the U.S. Fish and Wildlife Service has been conducted. A response is forthcoming.

The federally listed species analyzed in this document include the northern spotted owl (*Strix occidentalis caurina*). The Oregon spotted frog (*Rana pretiosa*) and the Pacific fisher (*Martes pennanti*) are federal candidates for ESA listing and are also on the Region 6 Regional Forester's Sensitive Species list.

**Description of Affected Species and Environmental Consequences**

Threatened, Endangered, and Federal Candidate Wildlife Species (Table 48) displays those species that are currently federally listed or candidates on the Deschutes National Forest and whether the species has been documented to occur within the Three Trails OHV project area.

**Table 48. Threatened, Endangered, and Federal Candidate Wildlife Species Documented to Occur or may Potentially Occur within the Three Trails OHV Project Area**

| Species | Listing Status | Habitat | Presence Within Three Trails Project Area |
|---|---|---|---|
| Northern Spotted Owl (*Strix occidentalis caurina*) | Federal Threatened | Old Growth Mixed Conifer Forest | Documented |
| Oregon Spotted Frog (*Rana pretiosa*) | Federal Candidate and Regional Forester Sensitive | Ponds, Marshes | Documented |
| Pacific Fisher (*Martes pennanti*) | Federal Candidate and Regional Forester Sensitive | Mixed Forest with Complex Structure | Unknown |

**Table 49. Summary of Conclusion of Effects for Threatened, Endangered, and Federally Candidate Wildlife Species, Three Trails OHV Project**

| Species/Habitat | Alt. A | Alt. B | Alt. C | Alt. D | Alt. E |
|---|---|---|---|---|---|
| Northern Spotted Owl | NLAA | NLAA | NLAA | NLAA | NLAA |
| Northern Spotted Owl Critical Habitat | NLAA | NLAA | NLAA | NLAA | NLAA |
| Oregon Spotted Frog | NI | NI | NI | NI | NI |
| Pacific Fisher | MIIH | BI | BI | BI | BI |

NLAA = May Effect, Not Likely To Adversely Affect
MIIH = May Impact Individuals or Habitat, But Would Not Contribute To a Trend Toward Federal Listing or Loss of Viability To the Population or Species
BI = Beneficial Impact
NI = No Impact

**<u>Summary Conclusions for Threatened and Endangered Species and Federal Candidates</u>**

1. Alternatives B, C, D, and E **"May Effect, Not Likely To Adversely Affect"** the northern spotted owl and northern spotted owl critical habitat.

2. Alternatives, B, C, D, and E would have "**No Impact**" on the Oregon spotted frog.
3. Alternatives B, C, D, and E would result in a determination of **"Beneficial Impact"** for the Pacific fisher.

Note: Where there was a "No Impact" determination, it was concluded the Three Trails OHV project either does not have the habitat for a particular species, or the zone of influence and its activities do not have the potential to overlap the biological needs of an individual, or a combination of both. Disclosure of effects associated with past activities in an incremental account is not the most informative manner in which to disclose effects. Modeling used in the evaluation for habitat suitability utilizes 2006 satellite imagery which accounts for past activities up to that date. As of July 2010, the only additional potential relevant activity that has been implemented since 2006 in the project area is the BLT Vegetation Project (specifically the Rabbit Timber Sale). Otherwise, disclosure of cumulative effects focuses on present and foreseeable actions, where a potential additive effect exists.

**Northern Spotted Owl, *Federal Threatened, Management Indicator Species***

**There would be no activity associated with the Three Trails OHV project occurring within Northern Spotted Owl Nesting, Roosting, and Foraging (NRF) habitat.**

## Existing Condition

In June 1990 the northern spotted owl was listed as a threatened species by the U.S. Fish and Wildlife Service (USFWS) and critical habitat was designated in 1992. In 2004 the USFWS completed a five year review of the status of the owl. They concluded a change in the classification of the owl was not warranted (USDI 2004). Beginning in 2004 a series of new publications became available on the northern spotted owl. In September 2004, the Sustainable Ecosystem Institute (SEI) under contract to the USFWS released a document titled *The Scientific Evaluation of the status of the Northern Spotted Owl*. Anthony et al. (2004) released a paper on the *Status and Trends in Demography of Northern Spotted Owls* 1985-2003. In September 2005 the Forest Service released a General Technical Report (GTR) on the *Status and Trends of Northern Spotted Owl Populations and Habitat* (Lint 2005). The Forest Service publication looked at results from monitoring spotted owl populations and habitat during the first 10 years of implementation of the Northwest Forest Plan (NWFP). Collectively, these documents have been reviewed for relevant new information regarding the magnitude or imminence of previously identified threats to the species, new information regarding new threats, and their applicability to the Three Trails OHV project. Some key results of these reports are listed below:

**Review and Summary of Key Findings Regarding the Northern Spotted Owl**

The Bureau of Land Management (BLM), Forest Service (FS), and U.S. Fish and Wildlife Service (USFWS) coordinated review of recently completed reports containing information on the Northern Spotted Owl (NSO). These agencies reviewed the following reports (hereinafter collectively referred to as the reports):

- *Scientific Evaluation of the Status of the Northern Spotted Owl* (Sustainable Ecosystems Institute, Courtney et al. 2004);
- *Status and Trends in Demography of Northern Spotted Owls, 1985-2003* (Anthony et al. 2004);
- *Northern Spotted Owl Five Year Review: Summary and Evaluation* (USFWS, November 2004); and
- *Northwest Forest Plan – The First Ten Years (1994-2003): Status and trend of northern spotted owl populations and habitat, PNW Station Edit Draft* (Lint, Technical Coordinator, 2005).
- *U.S. Fish and Wildlife Service. 2007. Draft Recovery Plan for the Northern Spotted Owl (Strix occidentalis caurina).* Portland, OR. 176 pp.

- *Scientific Review of the Draft Northern Spotted Owl Recovery Plan and Reviewer Comments* (Sustainable Ecosystems Institute, Courtney et al. 2008).
- *U.S. Fish and Wildlife Service. 2008. Recovery Plan for the Northern Spotted Owl. Strix occidentalis caurina*. Portland, OR. Xii+142 pp.

Full reports are accessible on the internet as follows:

- Courtney et al. 2004: http://www.sei.org/owl/finalreport/finalreport.htm
- Anthony et al. 2004: http://www.reo.gov/monitoring/trends/Compiled%20Report%20091404.pdf
- USFWS, November 2004: http://www.fws.gov/pacific/ecoservices/endangered/recovery/5yearcomplete.html
- Lint, Technical Coordinator, 2005: http://www.reo.gov/monitoring/10yr-report/northern-spotted-owl/documents/owl_text%20and%20tables.pdf

The most important conservation concerns addressed in the reports are:

1) The precipitous NSO population declines in Washington and declining trends in the three northern Oregon demographic areas, as described by Anthony et al. 2004;
2) The three major current threats identified by Courtney et al. (2004):
    - lag effects from prior harvest of suitable habitat,
    - habitat loss due to wildfire in portions of the range,
    - competition from barred owls.
3) The threat from wildfire is underestimated in the Draft Recovery Plan for the dry forest provinces and the threat is likely to increase given current forest conditions and future climatic change (Courtney et al. 2008).

Some of the key findings from these reports are that reductions of spotted owl habitat on federal lands are less than those originally anticipated by the USFWS and the NWFP (Courtney et al. 2004). This is because harvest has not occurred at the levels modeled and ingrowth of vegetation has occurred faster than anticipated. The primary current source of habitat loss is catastrophic wildfire (Courtney et al. 2004). Although the total amount of habitat affected by wildfires has been small, there is concern for potential losses associated with uncharacteristic wildfire in a portion of the species range. Lint (2005) indicated that the Northwest Forest Plan (NWFP) recognized wildfire as an inherent part of managing spotted owl habitat in certain portions of the range. Courtney et al. (2004) stated that the risk to spotted owl habitat due to uncharacteristic stand replacement fires is sub-regional, confined to the dry eastern portions of the range and to a lesser extent the southern fringes of the spotted owl range. Wildfires accounted for 75 percent of the natural disturbance loss of habitat estimated for the first decade of NWFP implementation (Courtney et al. 2004). A simple reserve network is unsustainable in east-side fire-prone habitats. Conservation strategies to be viable must be designed and implemented at the landscape scale (Courtney et al. 2008).

Anthony et al. (2004) indicated there was some evidence that barred owls may have had a negative effect on NSO survival in the northern portion of the NSO range. They found little evidence for such effects in Oregon or California. The threat from barred owl competition has not yet been studied to determine whether it is a cause or a symptom of NSO population declines, and the reports indicate a need to examine threats from barred owl competition. Courtney et al. (2008) stated that control of barred owls

may be warranted (to be determined after experimentation and other research) and would be consistent with conservation actions for other endangered species.

**Nesting Habitat Associations**

Spotted owls generally require mature or old-growth coniferous forest with complex structure including multiple canopy layers, large green trees and snags, heavy canopy habitat, and coarse woody material on the forest floor. A wide variety of forest types are utilized. Nesting, roosting and foraging habitat for the northern spotted owl on the Deschutes National Forest includes stands of mixed conifer, ponderosa pine with white fir understories, and mountain hemlock with subalpine fir. Suitable habitat on the east side of the Cascade Mountains is naturally confined to a narrow forested band below the high-elevation subalpine forests and above the low-elevation lodgepole pine/ponderosa pines forests (USDI 1992). Neither of these forest types is considered spotted owl habitat. Suitable habitat is not usually found in large patches but usually occurs as inclusions within a larger stand therefore, habitat conditions are patch within stands and across the landscape.

On the Deschutes National Forest northern spotted owl nesting, roosting, and foraging habitat (NRF) is mapped as forested stands, regardless of plant association, having a total canopy cover greater than or equal to 40 percent AND a canopy cover of at least five percent among greater than 21 inches diameter at breast height (dbh) trees. This definition assumes that the stand is multi-storied and contains large trees defined as 32 inch diameter or greater (USDA 2006 Programmatic BA). A maximum 6,000 foot elevational limit was also applied in defining NRF habitat. At the present time there is no evidence of spotted owls nesting above 6,000 feet on the Deschutes National Forest which is the rationale for the 6,000 foot elevational cut-off. Field verification is also a method used to confirm NRF capability and/or delete those stands that have been incorrectly identified as NRF habitat. Stand exam data collected on Deschutes National Forest in occupied and previously occupied spotted owl nest stands seem to indicate a strong association with old growth Douglas-fir (Stone, pers. comm. 2005). This is consistent with dwarf mistletoe infected Douglas-fir trees being commonly used as a spotted owl nest on east-side forests (Forsman presentation 2005). However, Forsman et al. (2006) also stated spotted owls would use old growth ponderosa pine, Douglas-fir, and grand fir with cavities as nest sites with ponderosa pine being less commonly used.

Using the Deschutes National Forest NRF definition, there are approximately 4,684 acres of NRF habitat in the analysis area with about 90-95 percent of the acreage located on Royce Mountain and Odell Butte. The remaining NRF acreage is in small scattered parcels on the western boundary of the analysis area near Chinquapin Butte and Beals Butte.

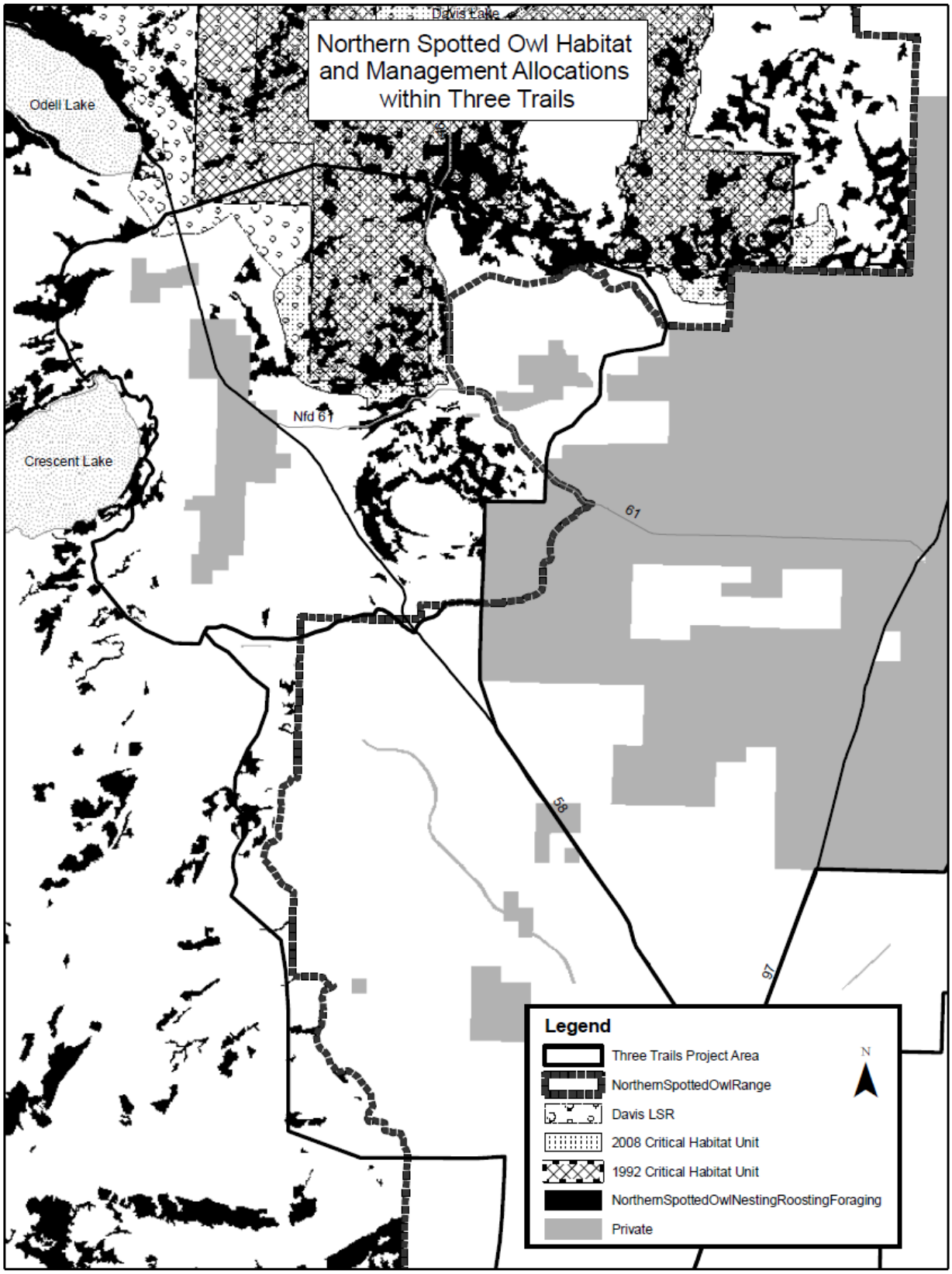


**Figure 24. Northern Spotted Owl Nesting, Roosting, and Foraging Habitat (NRF), 1992 and 2008 Critical Habitat and Davis Late-Successional Reserve (LSR) Displayed**

**Prey Base**
Habitat conditions that support good populations of northern flying squirrels, western red-backed voles, other nocturnal or small mammals active at first and last light, birds, and insects are essential to supporting spotted owls. An analysis of local spotted owl pellets showed the primary prey species for the Deschutes National Forest is the northern flying squirrel with red-backed vole, bushy-tailed woodrat, western pocket gopher, Douglas squirrel, snowshoe hare, voles, mice, and insects as secondary prey items. Forsman et al. (2006) stated that northern spotted owl diets on east-side forests showed northern flying squirrels make up about 40 percent of the owl diet in numbers of prey captured. He also stated that bugs represent 15 percent, other mammals 12 percent, red-backed voles ten percent, woodrats eight percent, and rabbits and pikas five percent of their total prey captures.

**Dispersal**
The term dispersal habitat is commonly used to describe forest stands used by juvenile spotted owls during movement away from natal areas or by subadult and adult owls moving from one territory to another (Forsman et al. 2002 cited in Lint 2005). Generally, forest stands with an average tree diameter greater than 11 inches and conifer overstory trees with closed canopies (greater than 40 percent canopy closure) with open space beneath the canopy to allow for the owls to fly are considered owl dispersal habitat (Thomas et al. 1990 in Lint 2005).

The dispersal habitat definition described above is not biologically possible in all east-side Cascades plant association groups. The Deschutes National Forest convened a science team of experts on local conditions to determine dispersal habitats. The team determined a process by which local biological knowledge of sites would be used to describe dispersal habitat (USDA Letter 1996). The criteria displayed in Table 50 were the results of the prescribed process and used to define dispersal habitat. This dispersal definition has been used since 1996 in subsequent NEPA documents and would also be used for the Three Trails OHV project.

**Table 50. Dispersal Habitat Definition Developed by Deschutes National Forest**

| Plant Association Group | Even-aged Stands | Uneven-aged Stands |
|---|---|---|
| Mixed Conifer Wet | 11” dbh, 40% Canopy Cover | 11” dbh, 40% Canopy Cover |
| Mixed Conifer dry | 8” dbh, 35% Canopy Cover | 11” dbh, 35% Canopy Cover |
| Ponderosa Pine | 8” dbh, 35% Canopy Cover | 11” dbh, 35% Canopy Cover |
| Lodgepole Pine | 7” dbh, 30% Canopy Cover | 7” dbh, 30% Canopy Cover |
| Mountain Hemlock | 7” dbh, 30% Canopy Cover | 7” dbh, 30% Canopy Cover |

While past regeneration harvests have created edge habitat on Odell Butte and Royce Mountain, owl dispersal through forested stands meeting the dispersal definition is possible through the NWFP portion of the project area. There have been no large fire events which have eliminated spotted owl dispersal ability through this area. The 381 acre Royce Butte Wildfire in September 2008 burned through stands of lodgepole pine on either side of Highway 97 adjacent to the community of Crescent Lake Junction. However, these stands did not meet the definition of lodgepole pine dispersal habitat. There are approximately 17,448 acres of dispersal habitat not including the 4,684 acres of NRF habitat within the project area. Dispersal habitat is present on 54 percent of the National Forest System lands in the project area. Combined NRF and dispersal habitat acreage totals 22,132 acres or 69 percent of the National Forest System lands (32,044 acres) within the range of the northern spotted owl in the project area.

**Northern Spotted Owl Critical Habitat and the Recovery Plan**
The Three Trails OHV analysis area lies within the Eastern Cascades Province which includes all forested lands in Oregon east of the crest of the Cascades and north of the Klamath Mountains province within the range of the spotted owl. This province provides the easterly extension of the spotted owl in Oregon.

The northern spotted owl was listed as federally threatened in 1990 and a draft recovery plan was published in 1992 (USFWS 1992). However, that plan was not completed due to the development of the Northwest Forest Plan in 1994, which became the cornerstone for conserving and recovering the northern spotted owl on 24.4 million acres of federal land in Oregon, Washington, and California.

The Northwest Forest Plan only addressed northern spotted owl conservation on federal lands and did not establish criteria for measuring whether the species has recovered. A revised recovery plan was released for public comment in 2007. A Final Recovery Plan for the Northern Spotted Owl was signed on May 13, 2008. For lands east of the Cascade crest, a landscape management approach is recommended due to the landscape being strongly influenced by natural disturbances such as wildfire and insect outbreaks. The Plan recognized the need to manage entire landscapes to meet spotted owl objectives. It lists a series of recovery actions to identify, maintain, and restore a percentage of the habitat capable lands to provide spotted owl habitat patches. Implementation of the plan would also reduce the potential of significant loss by stand replacement fires, insects, and disease by using active forest management. The Recovery Plan recommended the formation of a Dry Forest Province workgroup. Appendix E of the Recovery Plan provides information on managing for sustainable spotted owl habitat in the dry Eastern Cascades forests.

On August 13, 2008, the U.S. Fish and Wildlife Service announced a Revised Designation of Critical Habitat for the Northern Spotted Owl (Federal Register Vol. 73, No. 157, August 13, 2008). At the present time, the landscape management approach for the eastside provinces identified in the Recovery Plan was not incorporated into the new Critical Habitat Rule until the new approach is further defined. In the interim for eastside provinces, the areas identified as Option 1 Managed Owl Conservation Areas (MOCAs) in the 2007 draft recovery plan are finalized as Critical Habitat in this rule. There is one Critical Habitat Unit totaling 34,233 acres within the Crescent Ranger District boundaries and has a relatively similar configuration as the prior Critical Habitat Unit CHU OR-07 and also overlaps the Davis Late-Successional Reserve (DLSR) (Figure 24). Approximately 5,915 acres of 2008 Critical Habitat Unit is within the boundaries of the Three Trails OHV analysis area located on Royce Mountain. There are also approximately 4,823 acres of CHU OR-07 that was designated in the 1992 Draft Recovery Plan also on Royce Mountain.

**Davis Late-Successional Reserve (DLSR)**

Approximately 7,303 acres of the 48,900 acre DLSR extends into the Three Trails OHV project area in the vicinity of Royce Mountain. The DLSR is one of many designated by the Northwest Forest Plan across the range of the northern spotted owl. Late-Successional Reserves are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl. These reserves are designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem (Northwest Forest Plan C-11). The Davis Late-Successional Reserve Assessment (DLSRA) was prepared by district personnel in 1995 to respond to objectives set for LSRs in the Northwest Forest Plan. The DLSRA developed twenty-eight Management Strategy Areas (MSAs) based on existing habitat conditions and guides management decisions based on land capability. Some MSAs are capable of providing northern spotted owl habitat while others were designed to emphasize other species or guilds such as black-backed woodpeckers, great gray owls, or bald eagles. For each MSA an existing condition, desired condition, objective, management options, and monitoring and evaluation elements were identified and documented in the LSRA.

The DLSRA was updated in 2007 to reflect changing habitat conditions primarily as a result of the Davis Fire of 2003. Approximately 21,000 acres of forest was burned with about 16,000 acres of that total burned to a moderate or high intensity with nearly complete tree mortality. Only around the edges of the fire was there a mosaic of burn intensities with patches of live trees. Overall, the Davis Fire altered 24

percent of the Davis LSR and removed 3,736 acres of NRF habitat from the fire plus another 223 acres of NRF habitat related to suppression efforts within the LSR (USDA 2004).

The major updates to the DLSRA for 2007 are: 1) to include more strategic fuels treatments along with density management to provide habitat over time, recognizing that these conditions would shift around the landscape as some areas fade out due to fires or insects, and as other areas grow back into these conditions; 2) a shift away from trying to manage dry ponderosa pine sites for spotted owl habitat; 3) controlled access management due to the increase in recreational use and the ongoing reduction of road densities; and 4) integrate CHU objectives within the LSR.

Another adjustment made for the 2007 update was that the "emphasis species" changed for several management strategy areas (MSAs). MSA "Y" and a portion of "J" in the wet lodgepole pine were adjusted to allow some fuels treatment. Strategic fuels treatments are necessary to provide landscape level risk reduction to the entire LSR. MSAs I, O, and J were changed from an eagle focal species to a joint bald eagle and northern spotted owl focal species in recognition of the importance of these MSAs for spotted owl connectivity and establishment of newly found spotted owl activity centers. MSA "F" was changed from a bald eagle to a spotted owl focus based on the presence of large diameter Douglas-fir capable of providing northern spotted owl habitat.

In general, the existing levels of access were not considered to be a major issue across the LSR. The following relevant direction regarding Access and Travel Management is found starting on page 116 of the DLSRA: "Do not construct roads within the LSR for silvicultural, salvage, and other activities unless potential benefits outweigh habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines, they will be kept at a minimum, be routed through non-late successional habitat where possible, and designed to minimize adverse impacts. Equal number of miles of road should be obliterated so the total density of roads does not exceed maximum recommendations."

Further direction is provided regarding target road density and motorized use:

***The target "open road" density:***
Overall open road density of the LSR is not to exceed 1 mi/mi² with no single MSA exceeding 1.5 mi/mi². The exceptions would be in those MSAs where road densities can not be reduced to 1.5 mi/mi² due to the size of the MSA and the number of major roads in them that cannot be closed.

***The target "total road" or "objective" density:***
Overall, total road density of the LSR is not to exceed 2.0 mi/mi², with no single MSA exceeding 2.5 mi/mi². The exception would be those smaller MSAs (identified in a roads analysis) where major roads and those closed (Maintenance Level 1) make further reductions not feasible. A factor that should be considered is access on closed roads for potential fire suppression actions.

- All winter and summer motorized access is to be on designated routes (only) by the year 2013. No additional trails are to be created. Disturbance, displacement, and reduction of habitat due to trails often occur with off-road motorized vehicles, including snowmobiles (Graves and Reams 2001; Stokowski and LaPointe 2000).

For more details on proposed activities within the Davis LSR and a determination of consistency, reference the section titled Old Growth, Davis LSR, and Connectivity.

**Spotted Owl Survey Status and Home Ranges**
The Three Trails OHV project area partially overlaps geographically with several recent vegetation analysis areas (BLT Environmental Impact Statement, 2008), the Seven Buttes Return Environmental

Assessment, 2001 and the Five Buttes EIS, 2007). Extensive spotted owl surveys to Region 6 protocol (1992) have been conducted in the BLT overlap area (east of Crescent Lake, Beals Butte and Chinquapin Butte) including three visits to protocol in 2001, 2002, 2003, 2005, and 2006. Within the Seven Buttes Return-Five Buttes overlap area (Odell Butte, Royce Mountain) three visit surveys to protocol were completed in 2004 and 2005 and surveys to owl activity centers only in 2006. In 2008 three visit surveys to protocol were also conducted on the north side of Davis Mountain, Hamner Butte, Cryder Butte, and Royce Mountain of the Five Buttes EIS analysis area. Three additional visits were completed in 2009 on the 2008 survey routes. The results of all surveys completed since 2001 confirm there are three spotted owl territories (Royce, Hamner, and McCool) that overlap completely or partially within the Three Trails OHV analysis area. Table 51 displays the occupancy and nesting status for the last 10 years of the three pairs of spotted owls with home ranges extending into the project area.

**Table 51. Nesting and Occupancy Status of Northern Spotted Owls with Home Ranges within the Three Trails OHV Project Area (2001-2010)**

| Owl Pair Name/Number | Status 01 | Status 02 | Status 03 | Status 04 | Status 05 | Status 06 | Status 07 | Status 08 | Status 09 | Status 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| McCool Bt. (2001) | NA | UNK | NA | STVA | NA | NA | UNK | NA | NA | NA |
| Hamner Bt. (2002) | NA | NA | R/1 | P | P | NA | P-1 | P | R/1 | R/2 |
| Royce Mtn. (2010) | UNK | P-1 | P-1 | NA | NA | NA | UNK | NA | NA | NA |

NA = Not active P-1 = Pair site, 1 bird located UNK = Unknown status
P = Pair site occupied R/# = Pair, # of young STVA = Barred owl presence

### Barred Owl Documentation

Barred owls have been documented on the Crescent Ranger District since 1996 based on visual observations and vocalizations received while conducting voice or recorded spotted owl calls during protocol surveys. Within the analysis area there have been documented reports of single barred owls on Royce Mountain in 1996, 2006, 2009, and 2010. Other confirmed barred owl calls or observations outside the analysis area have been reported in the Little Deschutes River canyon in 1996, near Big Marsh in 2002, 2010, west of Beals Butte in 2003, on McCool Butte in 2004, east of Crescent Lake in 2010, Ringo Butte 2010 above Odell Lake on Maklaks Mountain in 2005. Pairs of barred owls were not confirmed on the Crescent District until the spring and early summer of 2010 when pairs were heard at Crescent Lake, Big Marsh, and Ringo Butte. Because this is the first year pairs of barred owls have been documented it is unknown if pairs are now permanently established or just represent more single birds dispersing through the district.

### Current Motorized Use Patterns

At the present time, motorized use including OHV use within the range of the spotted owl portion of the project area would be described as low to moderate during most of the year with daily use not likely exceeding five to ten vehicles per day unless there timber sales in the area with logging and service trucks accessing these roads. Timing of snowmelt in the spring determines when 4-wheel drive and passenger vehicles have access to roads on Odell Butte and Royce Mountain. In most years this access is not provided until May and is available until snowfall returns in November. Dispersed camping in this area would also be described as light because lakes and/or reservoirs that tend to attract people are not present. Road use is generally light during the spring and summer for recreational driving, wildlife viewing, access to firewood cutting areas, and/or if commercial timber sales are operating in the area. However, beginning in late August road use increases with the opening of big game archery hunting seasons, followed by matsutake mushroom season and several thousand additional harvesters in the forests of the

Crescent Ranger District. In early October modern rifle deer season also brings in several thousand hunters followed by elk season in late October. Normally in early November the personal use firewood and mushroom harvesters shut down because of the end of the season and/or snowfall closes access roads. The mushroom harvesters generally drive four-wheel pick-up trucks and small cars to access mushroom areas and the big game hunters normally drive four-wheel drive trucks but OHVs are also commonly used on all gravel and native surface roads.

**Road and Motorized Trail Effects**

Effects to spotted owls resulting from noise including motorized use type of disturbance are largely unknown because little research has been conducted. Some studies have looked at spotted owl responsiveness to noise disturbance relating the results to nesting success and productivity while others have measured physiological responses.

Forman et al. (2003) noted that wildlife species react differently to abrupt noises versus noises that are present most of the time. OHVs and other motorized vehicles create abrupt disturbances that are usually short duration as opposed to noise levels near highways where sound is more continuous.

In a study conducted by Delaney and Grubb (2001 and 2003), they found spotted owls did not flush from nest sites/roosts when motorcycles were greater than 70 meters away and noise levels were less than 76 decibels. Owls were observed to flush only during the post-fledgling phase suggesting reluctance to flush during the nest incubation phase when presented with the same stimuli. Other findings of the studies showed that noise levels were louder at nest cavities than levels measured at ground level and even louder yet within nesting cavities compared to outside the cavities. Delaney and Grubb (2003) also determined that motorcycle sound levels were consistently louder than background ambient forest sound levels over a range of distances from 17 to 489 meters (56-1,604 feet). They also concluded based on information on owl hearing sensitivity that spotted owls were capable of hearing all motorcycles out to at least 490 meters (1,608 feet) where the trials were conducted. Delaney and Grubb (2003) also concluded they did not observe any difference in fledgling rates between manipulated and non-manipulated nests in the study. However, they also qualified that statement by saying their ability to detect a biologically meaningful difference in reproductive success and productivity was limited by sample population size. Their preliminary distance and sound threshold data for spotted owls (2003) is consistent with their predictions in (2001) that spotted owls are unlikely to flush from roost/nests when motorcycles are greater than 180 meters (590 feet) away. Delaney et al. (1999) found that the proportion of owls flushing in response to a disturbance was strongly and negatively related to stimulus distance and positively related to sound level.

In another study, fecal steroid levels were measured to determine at what distance spotted owls experience increased stress levels due to disturbance. Findings showed male northern spotted owls occurring within 0.41 km (0.25 mile) of a major haul road experienced higher levels of stress induced hormones than owls occurring farther from roads or in areas without roads and that season of effect was the same (Wasser et al. 1997). A similar pattern was not found in females except in a 1.5 month period when young begin to fledge. This may have the capability to decrease reproductive success and/or change foraging behavior through habitat avoidance or displacement of habitat use near motorized routes. 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 per day or less, which is far greater than occurs on central Oregon forest roads.

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). Therefore, a distance of 200 meters or 660 feet was used to evaluate the effect of roads on the northern spotted owl.

Roads also result in the fragmentation of habitat. Spotted owls are interior forest species and roads result in smaller patch sizes with a disproportionate amount of edge (Forman et al. 2003). Roads and the subsequent decrease in patch size and increase edge may result in additional habitat loss (Forman et. al. 2003). Ravens and great horned owls are attracted to edge habitats that may allow easier access into adjacent stands that may be occupied by spotted owls for nesting, roosting, or foraging purposes. This has the indirect effect of potentially increasing disturbance to spotted owls near roads.

Damiani et al. (2007) reviewed the relationship of noise disturbance from forest management activities during the breeding season to the reproductive success of northern spotted owls. Their review indicated that management actions conducted within 0.5 mile of an activity center did not have immediate effects on the reproductive output of northern spotted owls. Patterns in the data suggest that in high quality habitats disturbance may have cumulative negative effects that can take at least a decade to be expressed. However, it is not clear whether these effects only occur in high quality habitat or whether they occur in all levels of habitat quality but can only be detected in high quality habitat. Overall, they concluded that analysis of currently available data does not strongly support the claim that noise from land management activities adversely affects spotted owl reproduction. They also stated that they can not dismiss the possibility that these effects accumulate over time to result in significant long-term effects. In conclusion they recommended some relaxation of limited operating periods for land management actions coupled with further studies to verify that noise does not have cumulative effects on reproduction.

In the most recent review of spotted owl research, noise disturbance was not considered a threat to the species (Courtney et al. 2004).

***Environmental Consequences***

The proposed action would reduce the potential for vegetative habitat loss and disturbance from motorized vehicles as a result of changing where motorized use is allowed. Motorized use has the potential to fragment, damage, or eliminate habitats or to disturb the use of some habitats for the spotted owl due to noise or frequency of visits. The following measure would be used to evaluate the effects and associated effects of the planned activities:

- The acres of disturbed habitat within a 660 foot zone from each road and trail open for motorized use.

The following three tables display the amount of land base and spotted owl habitat within 660 feet of a motorized route in the project area by different land allocations and alternatives. In Alternative A, it was assumed all existing roads and user-created motorized trails that are present in the project area were being used resulting in a 660 foot buffer to each. For Alternatives B, C, D, and E, the buffer analysis was applied to every road and trail open for motorized use including those not designated as part of the Three Trails OHV project such as Maintenance Level 2 roads.

**Table 52. Total Acres of Nesting, Roosting, and Foraging (NRF) Habitat and Acres within the 660 foot of each side of theRoad or Trails used for Motorized Travel (Disturbed Habitat) within the Project Area**

| Acres of NRF in Project Area | Alternative | Acres of NRF Within Road Effect Distance |
|---|---|---|
| 4,684 | Alt A | 4,141 – 88% |
| | Alt B | 2,638 – 56% |
| | Alt C | 2,586 – 55% |
| | Alt D | 2,563 – 55% |
| | Alt E | 2,586 – 55% |

**Table 53. Total Acres of Davis LSR, 1992 Critical Habitat, and 2008 Critical Habitat and acres of Nesting, Roosting, and Foraging (NRF) Habitat and Acres within 660 feet of each side of a Road or Trail used for Motorized Travel (Disturbed Habitat) within the Davis LSR, 1992 Critical Habitat, and the 2008 Critical Habitat Designation within the Project Area**

| Acres in Project Area | Acres of NRF in Project Area | Alternative | Acres Within Road Effect Distance (Disturbed Habitat) | Acres of NRF Within Road Effect Distance (Disturbed Habitat) |
|---|---|---|---|---|
| Davis LSR 7,306 | Davis LSR 1,613 | Alt A | 5,692 – 78% | 1,374 – 85% |
| | | Alt B | 2,532 – 35% | 606 – 38% |
| | | Alt C | 2,532 – 35% | 606 – 38% |
| | | Alt D | 2,532 – 35% | 606 – 38% |
| | | Alt E | 2,532 – 35% | 606 – 38% |
| | | | | |
| 1992 Critical Habitat CHU OR-7 4,823 | CHU OR-7 1,180 | Alt A | 3,613 – 75% | 962 – 82% |
| | | Alt B | 1,179 – 24% | 293 – 25% |
| | | Alt C | 1,179 – 24% | 293 – 25% |
| | | Alt D | 1,179 – 24% | 293 – 25% |
| | | Alt E | 1,179 – 24% | 293 – 25% |
| | | | | |
| 2008 Critical Habitat 5,915 | 2008 Critical Habitat 1,602 | Alt A | 4,914 – 83% | 1,362 – 85% |
| | | Alt B | 2,061 – 35% | 595 – 37% |
| | | Alt C | 2,061 – 35% | 595 – 37% |
| | | Alt D | 2,061 – 35% | 595 – 37% |
| | | Alt E | 2,061 – 35% | 595 – 37% |

**Table 54. Acres of Spotted Owl Home Range and Nesting, Roosting, and Foraging (NRF) Habitat within 660 of each side of Road or Trail used for Motorized Travel (Disturbed Habitat) within the Project Area**

| Acres of Home Range in Project Area | Acres of Home Range NRF in Project Area | Alternative | Acres Within Road Effect Distance (Disturbed Habitat) | Acres of NRF Within Road Effect Distance (Disturbed Habitat) |
|---|---|---|---|---|
| Hamner Butte 686 | 440 | Alt A | 609 – 89% | 375 – 85% |
| | | Alt B | 474 – 69% | 301 – 68% |
| | | Alt C | 474 – 69% | 301 – 68% |
| | | Alt D | 474 – 69% | 301 – 68% |
| | | Alt E | 474 – 69% | 301 – 68% |
| McCool Butte 1,232 | 290 | Alt A | 1,077 – 87% | 253 – 87% |
| | | Alt B | 720 – 58% | 178 – 61% |
| | | Alt C | 720 – 58% | 178 – 61% |
| | | Alt D | 720 – 58% | 178 – 61% |
| | | Alt E | 720 – 58% | 178 – 61% |
| Royce Mountain 2,882 | 805 | Alt A | 2,175 – 76% | 663 – 82% |
| | | Alt B | 646 – 22% | 180 – 22% |
| | | Alt C | 646 – 22% | 180 – 22% |
| | | Alt D | 646 – 22% | 180 – 22% |
| | | Alt E | 692 – 24% | 180 – 22% |

**Alternative A**
**Direct and Indirect Effects**
***NRF Habitat Project Area***
Because this alternative does not propose the construction of any new trails or designate an official OHV trail system, the existing roads and user-created trails would be assumed to remain open for motorized use. Future use of Maintenance Level 1 roads and user-created trails and roads would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest.

As shown in Table 52, 4,141 acres (88 percent) of the current NRF habitat is located within 660 feet of each side of a road or trail used for motorized travel would remain in this condition with this alternative. Only limited research has been conducted to date on noise and spotted owls. Delaney and Grubb's (2003) study concluded their preliminary distance and sound threshold data for spotted owls (2003) is consistent with their predictions in (2001) that spotted owls are unlikely to flush from roost/nests when motorcycles are greater than 180 meters (590 feet) away. Wasser's et al. study (1997) indicated that male spotted owls exhibit higher stress levels near major logging haul roads which may tend to inhibit the owls use of disturbed habitats for foraging or roosting. Because of reduced foraging areas, this may result in a decrease in reproductive performance with less prey being captured to feed the female and nestling owls. The Wasser et al. (1997) study did not define major logging haul roads and it is currently unknown if this

effect is taking place within the home ranges of the spotted owl pairs within the analysis area or across the entire district. It is known that some spotted owl pairs are successfully reproducing fledglings with nest sites within ¼ mile of an open road system (Crescent District spotted owl nesting records).

***Davis LSR***

The amount and distribution of existing road and motorized trails would not change in the 7,306 acres of the 48,900 acre Davis LSR that overlaps with the Three Trails OHV project area. A total of 5,692 acres of the 7,306 acres (78 percent) of the LSR is within 660 feet of a motorized route and 1,374 acres (85 percent) of the Davis LSR NRF habitat is also within 660 feet of a motorized route. The most disturbed habitat may be those NRF stands nearest the most highly utilized roads in the Davis LSR including Highway 58, the Crescent Cut-Off road, and the Cascades Lakes Highway which experience high speed travel and hundreds of vehicles utilizing these roadways on a daily basis during the spotted owl nesting season. This could result in increased disturbance potential and predation risk and decreased habitat quality. However, two of the three spotted owl activity centers in the project area are greater than 660 feet from each of these road systems and are not likely contributing to impacts to known owl pairs. The Royce Mountain site center is located within 660 feet of an existing National Forest System road that is assumed to be experiencing some level of motorized use. As shown in Table 51 (spotted owl occupancy and nesting status) spotted owl presence has not been documented at this territory for several years. The reason(s) for lack of sightings and/or vocalizations is currently unknown and can not be pinpointed to a specific cause such as road densities and associated disturbed habitats.

***Critical Habitat (CHU OR-7 and 2008 CHU)***

All existing roads and user-created trails would assume to remain open for motorized use resulting in 3,613 acres (75 percent) of the CHU OR-7 acres within the 660 foot disturbance zone and 962 acres (82 percent) of the CHU NRF habitat also being within the 660 foot disturbance zone. Within the 2008 CHU designation there are currently 4,914 acres (83 percent) within the 660 foot motorized disturbance zone and 1,362 acres (85 percent) of the 2008 CHU NRF acres also within the disturbed habitat zone. Based on the limited research available, impacts seem to focus on disturbance of owls within ¼ mile of major logging haul roads and motorized disturbance within 660 feet of roost/nest sites. The majority of the roads/trails in the project area do not experience high levels of use except on the paved highways. Low usage occurs on National Forest System roads/trails until late summer when big game archery season and matsutake mushroom season starts which is after the spotted owl nesting season. Elevated road usage can occur however, where active timber sales are present although seasonal restrictions are in place for logging activities within ¼ mile of active nest sites. Because two of the three known spotted owl activity centers are greater than 660 feet away from roads/trails and greater than ¼ mile from high density traffic, motorized disturbance is unlikely to flush owls from their nests or roosts or result in increased stress levels to spotted owls. The Royce Mountain activity center is located within 660 feet of an existing native surface road that is assumed to be experiencing a very limited amount of motorized use probably less than five vehicles per day. As shown in Table 51 (spotted owl occupancy and nesting status) spotted owl presence has not been documented at this territory for several years. The lack of sightings and/or vocalizations is currently unknown and can not be pinpointed to a specific cause such as road densities and associated disturbed habitats.

***Spotted Owl Home Ranges***

All or portions of three spotted owl home ranges are within the boundaries of the Three Trails OHV project area. The entire Royce Mountain home range is within the project area and portions of the McCool Butte and Hamner Butte home ranges partially overlap with the project area. As shown in Table 54 for the Hamner Butte territory 609 acres (89 percent) of the home range acreage within the Three Trails OHV project area is within the motorized disturbance zone and 375 acres (85 percent) of the existing NRF is also within the disturbance zone. For the McCool Butte territory 1,077 acres (87 percent) of the home range acres and 253 acres (87 percent) of the NRF habitat are also within the disturbance

zone. The Royce Mountain territory has 2,175 acres (76 percent) of the home range and 663 acres (82 percent) of NRF habitat within the disturbance zone.

There is no site specific data to suggest current road densities and associated disturbance zones are having a neutral or negative effect on the three spotted owl territories that overlap with the Three Trails OHV project area. The limited research does seem to indicate that male spotted owls exhibit higher stress level hormones if their roost or nest activity center is within ¼ mile of a major logging road (Wasser et al. 1997). The study did not describe what "major" road meant in terms of use, volume of traffic, daily or seasonal pattern of use.

Of the three territories, only the Royce Mountain site center is located within 660 feet of an existing road that is assumed to be experiencing some level of motorized use. As shown in Table 51 (spotted owl occupancy and nesting status) spotted owl presence has not been documented at this territory for several years. The lack of sightings and/or vocalizations is currently unknown and can not be pinpointed to a specific cause such as road densities and associated disturbed habitats. Motorized traffic usage, timing and types of vehicles on the road systems in this home range has not changed and there has been no loss of NRF habitat so the lack of spotted owl responses remain unknown.

**Trend Of Effects**

The general trend in spotted owl responses and habitat quality in the project area has remained essentially the same over the last decade. There has been less than 100 acres of NRF habitat commercially thinned in the last decade in the project area near the east side of Crescent Lake and several miles away from the nearest spotted owl territory. There has also been some non-NRF acreage commercially thinned in the project area to advance tree growth into stands capable of providing NRF habitat in the future. A foreseeable project although currently in litigation (Five Buttes EIS) does propose limited NRF habitat treatments of commercial thinning on Royce Mountain and Odell Butte within the Three Trails OHV project area although outside known spotted owl territories. The treatments are designed to reduce risk of wildfires entering into spotted owl territories and removing habitat. If implemented, the silvicultural and fuels prescriptions should allow home range NRF habitat to be maintained longer for spotted owl use although these stands are still subject to large tree loss from disease and insect events.

While barred owls seem to be on the increase it is currently unknown if they are inhibiting spotted owl responses. It is also unknown if barred owls will be established as permanent, reproducing pairs in the project area over the next decade and would compete with spotted owls for nesting and foraging habitats in the project area. As previously mentioned the Hamner spotted owl has a home range that extends into the project area and has successfully reproduced fledglings in 2009 and 2010 so occupancy and reproduction is still present for one pair that inhabits the project area.

**Effects Common to All Action Alternatives (B, C, D, and E)**

***NRF Habitat Project Area***

***None of the action alternatives propose the construction of any new trails within NRF habitat.***

All action alternatives would designate an OHV trail system comprising a combination of existing roads, roads converted to trails, user-created trails and construction of new motorized trails. In addition, some Maintenance Level 2 roads would also be available for OHV use. Associated actions to the designation of an official OHV trail system include the following: design and construction as needed for OHV staging areas, listing of viewpoints on OHV user maps, rehabilitation of user-created trails using logs, rocks, boulders, and/or subsoiling as needed, closure of roads and trails through signing, log, or boulder placement that are not needed for the OHV trail system, and the construction of an OHV bridge over the Little Deschutes River in Alternative C. Staging areas are designed to allow vehicle parking and may include overnight camping sites, toilets, picnic loops, fire rings, and OHV learner loops depending on

whether sites are to be fully developed, semi-developed with fewer amenities, semi-primitive with fewer services. Fully developed staging areas would 3-5 acres, semi-developed areas at 2-3 acres, and semi-primitive areas 1-2 acres. The alternatives propose a different numbers of staging areas and levels of development (see Recreation report in Chapter 3) though no new staging areas would be developed within the range of the spotted owl.

Disturbed NRF habitat analysis was completed by buffering 660 feet on each side of a road or trail that would be open for motorized travel for each action alternative. As shown in Table 49 there is virtually no difference in the amount of acreage impacted between the four action alternatives. All alternatives would result in a reduction of disturbed habitat from the current level (Alternative A) of 88 percent down to 55-56 percent of the total NRF habitat in the project area. Because the major roads in the project defined as paved highways (Highway 58, Crescent Cut-Off Road, and the Cascade Lakes Highway) would have no change in use, continued disturbance of NRF stands would occur. This would result in less owl use for foraging and roosting similar to what is presently occurring. Where trail and/or road closures are planned increased acreage of NRF stands would be available free of disturbance and allow use for nesting, roosting, or foraging that would improve spotted owl habitat quality. However, it is unknown if decreased disturbance would directly correlate into improved nesting and reproductive success. Delaney and Grubb (2003) study concluded they did not observe any difference in fledgling rates between manipulated and non-manipulated nests in their motorized disturbance study. However, they also qualified that statement by saying their ability to detect a biologically meaningful difference in reproductive success and productivity was limited by sample population size.

The staging areas planned in the action alternatives within the range of the spotted owl (Junction, Crescent Creek, and Simax Group Campground) are already developed. Consequently, there would be no loss of NRF habitat for the construction of staging areas. All user-created trails with rehabilitation planned for placement of rocks/ boulders, or logs and subsoiling within or adjacent to NRF stands would have a limited operating period applied if noise disturbance would occur within ¼ mile of a nesting spotted owl pair. With mitigation in place this activity would have no effect on spotted owls and habitat. The OHV viewpoints would not require the removal of any trees because these sites are on wide spots of existing roads and also have no effect on owls or NRF habitat. The construction of an OHV bridge over the Little Deschutes River south of the Two River North subdivision is outside the range of the spotted owl and therefore, have no effect on the spotted owl or their habitat.

There is a projected 2.5-5.6 percent annual increase in motorized use with the designation of an official OHV trail system for the first few years at least. Motorized usage would increase on those roads and trails open for use because of the trail designation and that other roads are being closed forcing use onto open roads. For the analysis we concluded habitats within 660 feet of either side of open roads and motorized trails were disturbed habitat regardless of the amount of usage. Due to planned road and user-created trail closures the amount of disturbed habitat would be the same between all action alternatives and result in no greater effects to the owls or habitat. OHV trail maintenance may require the removal of five to ten snags per year based on maintenance conducted on other OHV trail systems on the Deschutes National Forest. Only those snags deemed a safety issue to trail riders would be removed. This small number of snags removed annually would represent an un-measureable percent of the total snags present in the entire 93,000 acre project area and none of the trails go into a spotted owl nest grove. Snag removal would have no effect on owls or their habitat.

***Davis LSR***
***There is no new trail construction planned in the Davis LSR***

Because some roads and user-created trails are being closed and there are no new trails being constructed in the LSR, there is a reduction in the amount of disturbed spotted owl habitat within the Davis LSR and

would be similar in all action alternatives as shown in Table 49. The amount of acreage within the disturbed habitat zone would decrease from 5,692 acres (78 percent) in Alternative A down to 2,532 acres or 35 percent in Alternatives B, C, D, and E. For NRF habitat the disturbed acreage would be reduced from 1,374 acres (85 percent) in Alternative A down to 606 acres (38 percent) with each action alternative providing more acreage available for owl use. While the amount of roads and trails in the LSR would decrease, motorized usage is projected to increase 2.5 to 5.6 percent each year as the OHV trail system becomes more widely known but are restricted to those roads and trails designated as open for motorized travel. For the analysis we concluded habitats within 660 feet of either side of open roads and motorized trails were disturbed habitat regardless of the amount of usage. Similar to that described for NRF habitat in the project area, there would be a measurable increase in disturbance free Davis LSR acreage and in NRF stands in the Davis LSR portion of the project area that improves overall habitat quality available to spotted owls.

There are no staging areas in the Davis LSR therefore, no impacts on habitat or spotted owls relating to new construction. There are three planned viewpoints on Royce Mountain within the LSR but all three sites are on existing wide spots of open roads and no tree cutting would be required. Therefore, there would be no effects to spotted owls, habitat, or the LSR. The construction of an OHV bridge crossing over the Little Deschutes River in Alternative C is outside the boundaries of the LSR, therefore no effect to the LSR. Annual OHV trail maintenance may require the removal of up to five to ten snags per year based on maintenance seen for other OHV trails systems on the Deschutes National Forest. The minimal number of snags removed would be an un-measurable number compared to those already existing in the 48,900 acre Davis LSR. Several recent wildfires (Davis Fire 2003 at 21,000 acres and Royce Butte Fire 2008 at 381 acres) have added tens of thousands of snags to the Davis LSR and the removal of five to ten annually would have no effect to the function of the LSR.

***Critical Habitat (CHU OR-7* and 2008 CHU)**
***There would be no new motorized road or trail construction proposed in 1992 Critical Habitat Unit CHU OR-7 or the 2008 CHU.***

Disturbance buffer analysis for 660 feet on each side of a road or trail open for motorized travel showed identical effects for each action alternative. This is the result of similar roads and trails open for use in each action alternative. As shown Table 53 disturbed CHU acreage would drop to 1,179 acres (24 percent) of the CHU from the existing 73,613 acres (75 percent). For NRF acreage with the 1992 CHU, disturbed acreage would drop to 293 acres (25 percent) from the existing 962 acres (82 percent) of the 1992 CHU NRF. Within the 2008 Critical Habitat boundaries disturbed acreage would drop to 2,061 acres (35 percent) from an existing level of 4,914 acres (83 percent). For 2008 CHU NRF there would be a reduction to 595 acres (37 percent) from the existing 1,362 acres (85 percent). As the system is developed and advertised, motorized use may increase 2.5-5.6 percent a year for the next few years resulting in more motorized use but still restricted to those routes open for motorized use. This would result in a measureable increase in un-disturbed habitat available to spotted owls that would also be higher quality. Similar to that described for the Davis LSR, any road and/or trail closures requiring motorized equipment that could be a disturbance to nesting spotted owls would have a limited operating period placed on the activity from March 1 through August 31 (see Project Design Features in Chapter 2).

There are no staging areas planned within the boundaries of the 1992 Critical Habitat Unit OR-07 or the 2008 Critical Habitat designation therefore, no effects on habitat or spotted owls relating to new construction. There are three planned viewpoints on Royce Mountain within the 2008 Critical Habitat boundaries but none are located within the 1992 Critical Habitat OR-07 boundaries. The planned viewpoints are on existing wide spots of open roads and no tree cutting would be required. Therefore, there would be no effects to the 2008 Critical Habitat nor the 1992 CHU OR-07. The construction of an OHV bridge crossing over the Little Deschutes River in Alternative C is outside the range of the spotted

owl therefore, also outside the boundaries of both Critical Habitat designations, therefore no effect to Critical Habitat. Annual OHV trail maintenance may require the removal of up to five to ten snags per year based on maintenance seen for other OHV trails systems on the Deschutes National Forest. The minimal number of snags removed would be an un-measurable number compared to those already existing in both the 1992 and 2008 Critical Habitat boundaries. The Davis Fire of 2003 burned 21,000 acres which overlaps the boundaries of the 1992 and 2008 versions of Critical Habitat. The fire created tens of thousands of snags and the annual removal of five to ten snags that are leaning over the trail and could cause a hazard to trail riders would have no measurable effect to the function of the 1992 or 2008 CHU.

***Spotted Owl Home Ranges***
***There would be removal of NRF habitat within any spotted owl home range that extends into the Three Trails project area.***

The change in the amount of disturbed home range acreages and NRF habitat is nearly identical in all action alternatives. The 660 foot disturbed habitat buffer applied to each side of a road or motorized trail resulted in a reduction of disturbed habitat decreasing from 609 acres (89 percent) to 474 acres (69 percent) in the Hamner Butte home range, from 1,077 acres (87 percent) down to 720 acres (58 percent) in the McCool Butte home range, and from 2,175 acres (76 percent) down to 646-692 acres (22-24 percent) in the Royce Mountain home range. For NRF habitat in each home range, the amount of disturbed habitat drops from 375 acres (85 percent) down to 301 acres (68 percent) in the Hamner Butte home range, from 253 acres (87 percent) down to 178 acres (61 percent) in the McCool Butte home range, and from 663 acres (82 percent) down to 180 acres (22 percent) in the Royce Mountain home range. The main reason why the percentages do not drop as dramatically in the Hamner and McCool home ranges is that fewer roads were proposed for closure and less than half of their home range acreages extend into the Three Trails OHV project area.

There is no site specific data to suggest road densities and associated disturbance zones are having a neutral or negative impact on the three spotted owl territories that overlap with the Three Trails OHV project area. The limited research does seem to indicate that male spotted owls exhibit higher stress level hormones if their roost or nest activity center is within ¼ mile of a major logging road (Wasser et al. 1997). The study did not describe what ”major” road meant in terms of use, volume of traffic, daily or seasonal pattern of use. Research on motorcycle use near spotted owl nests (Delaney and Grubb 2003) did not indicate any difference in fledgling rates between manipulated and non-manipulated nests in the study. However, they also qualified that statement by saying their ability to detect a biologically meaningful difference in reproductive success and productivity was limited by sample population size.

Based on the analysis conducted and the assumptions used, it is expected that greater acreage would be available to spotted owls for nesting, roosting and foraging purposes free of motorized disturbance with each action alternative. It is known that some spotted owl pairs are successfully reproducing fledglings with nest sites within ¼ mile of an open road system (Table 52). There is no site specific data to suggest road densities and associated disturbance zones are having a neutral or negative impact on the three spotted owl territories that overlap with the Three Trails OHV project area. Of the three territories, only the Royce Mountain site center is located within 660 feet of an existing road that is assumed to be experiencing some level of motorized use. As shown in Table 51 (spotted owl occupancy and nesting status) spotted owl presence has not been documented at this territory for several years. The lack of sightings and/or vocalizations is currently unknown and can not be pinpointed to a specific cause such as road densities and associated disturbed habitats.

There are several associated actions for the Three Trails OHV project. The Junction, Crescent Creek, and Simax Group Campground staging areas are within the range of the spotted owl but are already developed

though none are located within any spotted owl home range or are they considered NRF habitat. Therefore, construction of staging areas for this project would have no effect to the known owl pairs. The four viewpoints planned within the range of the spotted owl are on existing roads, would have no trees cut, and are also outside all three spotted owl home ranges. Therefore viewpoints would have no effect on the owls. All user-created trails with rehabilitation planned and within or adjacent to NRF stands would have a limited operating period applied if noise disturbance would occur within ¼ mile of a nesting spotted owl pair. With mitigation in place this activity would have no effect on spotted owls and habitat. The construction of an OHV bridge over the Little Deschutes River south of the Two Rivers North subdivision in Alternative C is outside the range of the spotted owl and therefore, has no effect on the spotted owl or their habitat. Annual OHV trail maintenance may require the removal of up to five to ten snags per year based on maintenance seen for other OHV trails systems on the Deschutes National Forest. The minimal number of snags removed that would cause a hazard to trail riders would be an un-measurable number compared to the tens of thousands of snags already existing in the 93,016 acre project area that includes the 381 acre Royce Butte Fire from 2008. Snag removal would have no effect on the spotted owl pairs.

**Determination**

To summarize, while there would be some designated OHV trails in the DLSR, there would be no new roads or trails created and therefore, no loss of NRF habitat for trail construction, staging areas, or designation of viewpoints. OHV usage is projected to increase 2.5 to 5.6 percent annually at least for the next few years as the trail system becomes more widely known. However, this increase would be restricted to those roads and trails open for motorized use. Disturbance buffer analysis still shows a reduction in disturbed habitat for the spotted owl in all action alternatives that would improve habitat quality in NRF stands, in the Davis LSR, in the 1992 and 2008 Critical Habitat boundaries and within all three spotted owl home ranges. However, reduced levels of motorized disturbance would still occur in NRF stands, in the Davis LSR, and the CHUs that is not completely mitigated with road and trail closures. While current research is limited the most recent review of noise disturbance on spotted owls concluded it was not a threat to the species (Courtney et al. 2004). This leads to a determination of **"May Effect, But Not Likely To Adversely Affect"** the northern spotted owl for all action alternatives.

**Critical Habitat Units**

Because no new trails are proposed for construction in the 1992 or 2008 Critical Habitat Units, no tree removal would occur that would negatively impact Critical Habitat. All action alternatives propose road and user-created trail closures that result in a reduction of disturbed habitat for the spotted owl in both Critical Habitat Units improving habitat quality as shown in Table 53. However, some disturbed habitat from roads and trails still open for motorized use would remain in the 1992 and 2008 Critical Habitat Units. This would lead to a determination of **"May Effect, But Not Likely To Adversely Affect"** 1992 Critical Habitat Unit OR-7 and the 2008 Critical Habitat Unit for all action alternatives.

**Cumulative Effects**

Table 11 was reviewed for projects that overlap within the same time and space and have the capability to create a cumulative effect. Because the Three Trails OHV project does not propose to remove or modify any spotted owl habitat, cumulative effects were considered on only those projects that overlap with the Three Trails OHV project area.

The only foreseeable action that overlaps the Three Trails OHV project area and has the capability to impact spotted owl habitat is the Five Buttes EIS (2007). Although this project is in litigation, if implementation occurs in the future, it would allow approximately 173 acres of commercial thinning treatments of NRF habitat that overlaps the Three Trails OHV project area and 1.9 miles of temporary road constructed to access these acres. All 173 acres are outside the Hamner, McCool, and Royce spotted owl home ranges. The 173 acres represents approximately four percent of the total 4,684 acres of NRF

habitat in the Three Trails OHV project area. The Five Buttes analysis concluded NRF habitat conditions would return in an estimated 20-50 years based on silvicultural prescriptions with most of the acreage coming into NRF conditions in 20-30 years. Eleven acres are programmed for heavy thinning which may require up to 50 years to be defined as NRF habitat again. This would result in a short-term decrease in habitat quality on the treated NRF stands although the acres could still be used for foraging and dispersal purposes. The USFWS in their Biological Opinion for the Five Buttes EIS (USDI 2007) stated while the project would adversely affect suitable habitat for the spotted owl through the removal of 2,023 acres, the project will have long-term benefits to owl habitat across the landscape by reducing fuel loads, strategic placement of treatments that reduce the risk of stand replacement fire events, and reducing tree stocking densities to promote development of large trees into the future. They also concluded that such management will improve the long-term viability of suitable nesting, roosting, and foraging habitat for the owl. The USFWS also concluded it will likely have a beneficial effect on the forested areas within the CHU over time and will not adversely affect the biological integrity of the CHU network that supports spotted owl conservation within the eastern Oregon Cascade Province.

The temporary roads needed for Five Buttes timber harvest access would only be needed for the life of the project estimated at two to three years then the roads would be subsoiled and closed eliminating the temporary disturbance associated harvest activity and log hauling. Therefore, there are no known additive effects associated with past, present, or foreseeable actions so cumulative effects are not anticipated to occur.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

Private land ownership in the analysis area includes rural subdivisions and the community of Crescent Lake Junction. None of the private land acreage within the range of the spotted owl is considered NRF habitat because of plant association, tree size and densities, and that some of the private land is in housing tracts. Therefore, actions associated with private lands in the Three Trails OHV project would not contribute to cumulative effects.

**Consistency with the Programmatic Biological Assessment (BA)**

The Three Trails OHV project complies with all spotted owl Project Design Criteria (PDCs) described on pages 84-85 of the 2006-2009 Joint Terrestrial and Aquatic Programmatic Biological Assessment for Federal Lands within the Deschutes and John Day River Basin's Administered by the Deschutes and Ochoco National Forests. Consequently, informal consultation with the U.S. Fish and Wildlife Service has been initiated and is expected to result in a letter of concurrence for the spotted owl and Critical Habitat.

**Oregon Spotted Frog *(Rana pretiosa), Federal Candidate, R6 Sensitive***

The Oregon spotted frog (*Rana pretiosa*) is currently listed as a federal candidate species by the USFWS. Spotted frogs have a historic distribution that covers a small part of western North America, from southern British Columbia to northeastern California, and from the west side of the Willamette Valley to the east side of the Klamath Basin in Oregon. They have been extirpated in much of their range by introduction of the bullfrog, (*Rana catesbeiana*) and habitat alternation, loss through intensified agriculture, grazing, and urbanization (USGS 2003). Pearl (pers. comm. 2008) remarked that central Oregon including Big Marsh on the Crescent Ranger District and Sunriver south of Bend, seem to represent strongholds for the species and have the largest populations in the state of Oregon.

**Ecology:** Oregon spotted frogs are associated with wetland complexes greater than four hectares (10 acres) in size with extensive emergent marsh coverage that warms substantially during seasons when Oregon spotted frogs are active at the surface and sites always include some permanent water juxtaposed to seasonally inundated (Pearl and Hayes 2004 cited in Cushman and Pearl 2007). They use shallow oviposition sites consistently across their range with average depths per site ranging from 2.3 inches to 10 inches in depth (Pearl and Hayes 2004). Oviposition usually occurs between mid-February and mid-April depending on water temperature. The diet of the Oregon spotted frog includes arthropods (e.g. spiders, insects) earthworms and other invertebrate prey. In turn, they may be preyed upon by mink, river otter, herons, bitterns, corvids, and garter snakes. Threats to the species were hypothesized by Cushman and Pearl (2007) to include direct loss and conversion of marsh habitats, interactions with non-native fishes, plant succession and other vegetation changes, livestock grazing, degraded water quality, isolation from other populations, and drought.

**Existing Condition**: Within the Three Trails OHV analysis area spotted frogs have been documented in an overflow pond of Crescent Creek near Highway 58 with greater than 20 egg masses confirmed in April 2009 and adults and subadults in the Little Deschutes River near Highway 58 from inventories conducted in 2001 (Branum, pers. comm. 2001). As of January 2010 there are no confirmed breeding sites of Oregon spotted frogs along the Little Deschutes River within the project area. Branum (pers. comm. 2008) stated surveys for Oregon spotted frogs were also conducted in Hemlock and Spruce Creek drainages of the analysis area during the mid-1990s though no spotted frogs were located. It is hypothesized that cold water temperatures in these streams may inhibit occupancy by Oregon spotted frogs. The largest spotted frog population on the Crescent Ranger District is in Big Marsh, outside the project area. Over 2,500 individual Oregon spotted frog egg masses have been recently confirmed in Big Marsh (Crescent District records, 2007).

***Environmental Consequences***

**Alternative A – Existing Condition**

At the present time, there is no indication that existing roads, user-created trails, and dispersed campsites within the riparian zone of the Little Deschutes River and Crescent Creek are affecting documented Oregon spotted frog sites. Most areas along the Little Deschutes River have well established dense clumps of willows that effectively limit motorized travel within the wetted portions of the riparian zone. Crescent Creek has one documented breeding pond within the project area. However, this site is currently unaffected by recreational activities as it is remote and would be assumed to remain so because there is no vehicle or trail access off Highway 58 at the site.

Future use of Maintenance Level 1 roads and user-created trails and roads would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest.

**Effects Common to All Action Alternatives (B, C, D, and E)**

Each action alternative proposes to reduce the amount of user-created trails in the riparian zones of Three Trails OHV project area from a current 13.26 miles to a range of 3.06 miles in Alternative B, 2.25 miles in Alternative C, 1.12 miles in Alternative D, and 1.14 miles in Alternative E. Closure methods include the placement of rocks/boulders, and/or logs, and subsoiling as needed. While these roads and user-created trails are in the riparian areas they are not in the permanently wet areas that provide spotted frog habitat consequently, these actions would have no effect on the species. Alternative C does propose the construction of an OHV bridge over the Little Deschutes River south of the Two Rivers North subdivision. Because the bridge would span the river and wetland habitat this action would also have no effect on potential frog habitat. In addition, none of the action alternatives would create new trails, staging areas, or viewpoints that would impact wetland habitats along the Little Deschutes River or Crescent Creek where known Oregon spotted frog populations exist. There would also be no effect to the one known spotted frog breeding pond along Crescent Creek because no roads or trails are planned that

would access this site. All action alternatives would result in a reduced level of motorized access within riparian zones although walking access to the river is still possible from dispersed campsites along the river. Because no effects are anticipated with any action alternative, there are no cumulative effects.

**Determination of Effect**
Implementation of any action alternatively is not expected to negatively effect known spotted frog populations and habitat consequently; the determination is **"No Impact"** to the Oregon Spotted Frog. The Three Trails OHV project is consistent with all Project Design Criteria (PDCs) in the 2006-2009 Joint Aquatic and Terrestrial Programmatic Biological Assessment for Federal Lands in the Deschutes and John Day River Basin's Administered by the Deschutes and Ochoco National Forests (USDA 2006).

It is estimated that in early 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

**Pacific Fisher *(Martes pennanti), Federal Candidate, R6 Sensitive***
The USFWS was issued a court order in April 2003 to conduct a 90 day finding on a petition to list a distinct population segment of the fisher. In July 2003 the USFWS published a 90 day finding that substantiated a listing may be warranted and began a 12 month status review. In April 2004 the USFWS determined that the fisher in Washington, Oregon, and California is a "distinct population segment" of the entire fisher species. The USFWS determined that the fisher faces significant biological threats that are sufficient to warrant listing but is precluded by other higher priority listing actions (Federal Register Vol. 69, No. 68). Threats to the fisher include loss and fragmentation of habitat, mortalities and injuries from incidental captures, decreases in prey base, increasing human disturbance, and small isolated populations. An Interagency Fisher Conservation Assessment and Strategy document is being produced by the Interagency Fisher Biology Team with publication expected in late 2010. This document would assess the current status of fishers on the west coast, including synthesis of habitat and evaluation of threats. The goals of the strategy are to provide recommendations to restore and/or maintain habitat conditions that can support fishers, re-establish fisher populations and restore connectivity by creating and managing for resilient landscapes throughout the west coast assessment area.

**Ecology:** The fisher is a house-cat sized member of the Mustelidae family which includes weasels, mink, marten, and otters. Their occurrence is closely associated with low- to mid-elevation forests (generally less than 1250 m) with a coniferous component, large snags or decadent live trees, and logs for denning and resting, and complex physical structure near the forest floor to support adequate prey populations (Powell and Zielinski 1994). Rosenberg and Raphael (1986 cited by Kremaster and Bunnell in Rochelle et al. 1999) stated the fisher was negatively associated with edges at all scales of measurements and could be considered a forest interior species. However, fishers also venture into openings to feed (reviews of Buskirk and Powell 1994 and Martin 1994 cited by Kremaster and Bunnell 1999 in Rochelle et al. 1999).

Within a given region the distribution of fishers is likely limited by elevation and snow depth and fisher are unlikely to occupy habitats in areas where elevation and snow depth act to limit their movements (Krohn et al. 1997 cited by USFWS 2004). However, in mid-elevation areas with intermediate snow depth, fishers may use dense forest patches with large trees because the overstory increases snow interception (Weir 1995 cited by USFWS 2004). Aubry and Houston (1992 cited by Powell 1993) felt that snow affected fisher distribution and population density in Washington state. Powell (1993) also stated that fishers would choose habitats with prey they can catch. Those habitats would meet the requirements of fisher prey as well as be structured such that fishers can forage successfully without high foraging costs.

Prey item remains collected in Oregon include snowshoe hare, brush rabbit, California ground squirrel, Douglas' squirrel, northern flying squirrel, woodrats, opossum, striped skunk, porcupine (male fishers only), bobcat, deer, elk, Stellar's jay, pileated woodpecker, and hairy woodpeckers (Aubry and Raley 2002). Fishers are fast, agile and adept at climbing trees and would eat any prey they can catch and overpower, including squirrels, hares, mice, birds, and porcupines. Although adapted for climbing, fishers are primarily terrestrial. When inactive, the fisher occupies dens in tree hollows, under logs, or in ground or rocky crevices, or rests in the branches of conifer trees during the warmer months. Female fishers give birth and raise kits in cavities in large-diameter (greater than 80 cm, 31 inches) live trees, snags, and logs, and use these structures and large platform branches for rest sites (Powell and Zielinski 1994; Aubry and Raley 2002). In the western USA, fishers generally avoid clearcuts and forested stands with less than 40 percent canopy cover (Buck et al. 1994; Jones and Garton 1994 cited by Aubry and Lewis 2003). Powell (1993) reported that open habitat vegetated with young deciduous trees and shrubs (typical of clear-cut areas) are used by fishers in summer but are truly open with no overhead cover in winter. Aubry and Raley (2006) in a study area of the southern Oregon Cascades determined that home ranges for adult females was 25 square kilometers and for males averaged 62 square kilometers (non-breeding season) and 147 square kilometers during the breeding season.

Prior to extensive European settlement, fishers occupied most coniferous forest habitats in Washington, Oregon, and California (Aubry and Lewis 2003). Extensive trapping in the 1800s and 1900s is frequently cited as the principal initial cause of the substantial reduction of the range of the fisher in Washington, Oregon, and California (Federal Register Vol. 69, No. 68). Claar et al. (1999) stated that trapping may affect local populations and even light pressure may cause local extinction. Claar et al. (1999) also stated there is evidence that western fisher populations have lower natality and high natural mortality rates as compared to eastern populations. He recommended in travel planning, managers should consider ramifications of increased trapper access and distribution.

The extent of past timber harvest is one of the primary causes of fisher decline across the United States (Powell 1993 cited in USFWS 2004) and may be one of the main reasons fishers have not recovered in Washington, Oregon, and portions of California as compared to the northeastern United States (Powell and Zielinski 1994). Habitat fragmentation has contributed to the decline of fisher populations because they have limited dispersal distances and are reluctant to cross open areas to re-colonize historical habitat (USFWS 2004). Fishers have a low annual reproductive capacity; not all females produce young every year and litters usually consist of two to three kits raised entirely by the female. In addition, recent evidence suggest only juvenile males disperse long distances which would affect the rate at which fishers may be able to colonize formerly occupied areas within its historical range (Aubrey et al. 2003). Fishers are estimated to live up to 10 years (Powell 1993).

**Existing Condition:** In Oregon, the fisher apparently has been extirpated from all but two portions of its historical range (Aubry and Lewis 2003). Within Oregon the two known extant populations are in the southwestern portion of the state: one in the southern Cascade Range that was established through reintroductions of fishers from British Columbia and Minnesota that occurred between 1961 and 1981, and one in the northern Siskiyou Mountains of southwestern Oregon that is presumed to be an extension of the population in northern California. Genetic testing has revealed the populations are isolated from each other (Aubry et al. 2002). The same study revealed juvenile male fishers are capable of long distance dispersal with one collared male relocating to the Crescent Ranger District in the summer of 1999 having traveled fifty-five kilometers from point of capture on the Rogue River National Forest. The radio signal from this animal was lost in December 1999 due to battery failure.

Anecdotal information suggests that a few trappers target beaver, coyotes, and marten on the Crescent District including all or portions of the Three Trails OHV project area. It is currently unknown how many

animals are captured and/or if any fishers have been unintentionally captured during lawful trapping seasons for other species.

Carnivore surveys were conducted on the Crescent District in 1993-1996 and 1998 using bait with camera sets, snow tracking and track plates. There were no detections of fishers or wolverine from these surveys although marten were confirmed. As previously mentioned, the USFWS cite Krohn et al. (1997) as saying the distribution of fishers is likely limited by elevation and snow depth and the species is unlikely to occupy habitats where elevation and snow depth act to limit their movements. At the present time it is unknown if average annual snow depths and the high elevation of the Crescent Ranger District can support reproducing fisher populations.

Suitable denning habitat was defined as forested stands with greater than 20 inch diameter trees in lodgepole pine, ponderosa pine, white fir, Shasta red fir, and mountain hemlock plant association groups (PAGs) having a dense canopy greater than 40-55 percent depending on the PAG. Using this definition the Viable program estimated approximately 6,534 acres of habitat. This figure accounts for all past and present timber sales, natural events such as wildfires, and any other habitat altering activity that would express itself in a vegetative manner. This way of presenting information is most informative for the decision maker. The vast majority of this potentially suitable denning habitat is located on Odell Butte, Royce Mountain, lower slopes of Hamner Butte and along west slopes of Walker Mountain.

To help measure the potential effects of implementing the Three Trails OHV project on fisher habitat, a 660 foot road effect disturbance buffer was applied to each side of an open motorized route within potential denning habitat for each alternative. The following table displays acres of disturbed versus undisturbed habitat by alternative.

**Table 55. Acres within the Road Effect Distance and Acres of Undisturbed Denning Habitat for the Pacific Fisher by Alternative**

| | Alternative A | Alternative B | Alternative C | Alternative D | Alternative E |
|---|---|---|---|---|---|
| Acres Within Road Effect Distance (disturbed habitat) | 7,443 – 79% | 4,596 – 49% | 4,708 – 50% | 4,483 – 48% | 4,564 – 49% |
| Acres outside Road Effect Distance (undisturbed habitat) | 1,959 – 21% | 4,806 – 51% | 4,694 – 50% | 4,919 – 52% | 4,838 – 51% |
| **Total acres** | **9,402** | **9,402** | **9,402** | **9,402** | **9,402** |

***Environmental Consequences***

**Alternative A – Existing Condition**

The selection of this alternative would have no direct effects to fishers if present, or their habitat because no new trails or roads would be constructed for motorized use and no trees, snags, or logs would be removed from existing suitable habitat. However, as shown in Table 55 the existing high density of roads and user-created trails impact 79 percent of the modeled fisher denning habitat in the project area. This high level of motorized access would not be reduced which increases fisher risk of coming into contact

with the recreating public during the furbearer trapping season. This could lead to an increased risk of incidental catch and mortality from trappers that are legally targeting other species such as coyotes and marten even though there is no furbearer harvest season on fishers. While fishers have not been recently detected on the Crescent District and there is no evidence of fisher reproduction, the overall motorized route densities and corresponding disturbance distance analysis shows the species is at increased risk of incidental capture during lawful trapping seasons.

Use of Maintenance Level 1 roads and user-created trails would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest.

**Table 56. Expected Change in Motorized Route Densities expressed in Miles/Square Mile over the Combined 16 Subwatersheds that Completely or Partially Overlap the Three Trails OHV Project Area**

| | 6th Field Acres National Forest System Lands Only | Alt. A Total Motorized Density (Roads + Trails) $mi/mi^2$* | Alt. B Total Motorized Density (Roads + Trails) $mi/mi^2$ | Alt. C Total Motorized Density (Roads + Trails) $mi/mi^2$ | Alt. D Total Motorized Density (Roads + Trails) $mi/mi^2$ | Alt. E Total Motorized Density (Roads + Trails) $mi/mi^2$ |
|---|---|---|---|---|---|---|
| **Total** | **161,971** | **4.29** | **2.83** | **2.55** | **2.53** | **2.51** |
| * Alternative A includes all Maintenance Level 1 roads in the total density | | | | | | |

**Effects Common to All Action Alternatives (B-E)**

All action alternatives propose development of a designated OHV trail system that incorporates varying levels of existing roads, closed roads converted to motorized trails, user-created trails, and new motorized trail construction depending on the alternative. Alternatives B and D tend to concentrate trail use into blocks while Alternatives C and E have a system that is more dispersed over a larger amount of the project area. All action alternatives also propose the closure of a number of existing National Forest System roads to public motorized use. Table 56 shows the expected motorized route density averaged over the 161,971 miles of subwatersheds that completely or partially overlap with the Three Trails OHV project area. As shown in Table 55 and Table 56 motorized route densities decrease with each of the action alternatives which also coincide with a decrease in the amount of potential fisher denning habitat within the 660 foot disturbance buffer. As shown, all action alternatives would result in more undisturbed fisher habitat (i.e. less motorized access) as a result of fewer miles of open motorized routes as compared to Alternative A. All action alternatives have relatively the same effect by increasing the number of acres of undisturbed habitat with only 225 acres separating the four action alternatives.

Claar et al. (1999) provided some discussion on recreational impacts, conclusions, and guidelines/recommendations for fisher. They include:

- Recreation should be directed to designated travel routes.
- Drainage bottoms with riparian coniferous forests/mesic forest types appear to be preferred habitat for fisher and management strategies designed to maximize the benefits of these habitats would be desirable.
- Roads and trails are directly correlated with trapper access to forest carnivore populations and therefore, vulnerability to trapping mortality. Impacts of increased trapping mortality as a result of recreational development/use should be considered.

The Three Trails OHV project has designed an OHV system through a combination of trails and roads where off-road use would be prohibited except on designated trails. User-created roads/trails not part of

the designated trail system would be rehabilitated with the use of rocks, boulders, log placement, and subsoiling as needed. There are also no staging areas planned for development within stands identified as potential denning habitat. The viewpoints that would be indentified on trail maps are on existing wide spots of roads and no tree removal is needed, therefore this associated action would have no effect on fishers or their habitat. Alternative C proposes the construction of an OHV bridge crossing over the Little Deschutes River south of the Two Rivers North subdivision. Because this bridge would cross perpendicular to the river, it would minimize impact to riparian habitat although the crossing area is also not identified as potental denning habitat due to small tree diameters. Because road and trail closures are planned so that new trails would not impact denning habitat, there would be reduced motorized access overall in the project area making furbearer trapping more difficult. This would lessen the chance of fishers, if present in the project area, being caught in traps as a bycatch to other legal trapping species such as marten, coyotes, and bobcats. Consequently, Claar et al. (1999) recommendations have been reviewed in context of the Three Trails OHV project.

While OHV use is projected to increase at a rate of 2.5 to 5.6 percent annually all use would occur on a designated trail system that still results in a less dense motorized access system compared to the existing condition as shown in Table 56. Nor would the increased use result in a wider disturbed habitat imprint than shown in Table 55. Trail maintenance is also expected to annually remove five to ten snags that may be leaning over the trail system and cause a safety hazard to riders. This level of snag removal on a 93, 016 acre project is so small it cannot be quantified. Based on the projected decrease in overall motorized route densities and a corresponding increase in disturbance free fisher habitat in the project area, the implementation of any action alternative (B, C, D, or E) would result in a determination of **"Beneficial Impact"** to the Pacific fisher and their habitat.

**Cumulative Effects**

Table 11 was reviewed for projects with the capability to overlap in time and space as Three Trail OHV project with potential for cumulative effects. The zone was influence was defined as the 93,016 acre Three Trails project area. The BLT EIS (2009) partially overlaps Three Trails however the vast majority of the fisher denning habitat identified is in the Mt. Thielsen Wilderness and upper Little Deschutes River canyon both are outside the boundaries of the Three Trails OHV project area. Therefore, the thinning and fuels treatments planned for BLT would not be expected to result in a cumulative effect in addition to the actions proposed in Three Trails. A foreseeable project is the Five Buttes EIS (2007) although this decision is currently in litigation. The Five Buttes project partially overlaps the Three Trails OHV project area and the conclusions with Five Buttes stated the commercial thinning treatments planned would result in a reduction in habitat suitability for prey species such as snowshoe hares. The document also disclosed project implementation (timber sales and fuels treatments) may result in short-term disturbance for several years while the activities are occurring, if fishers are present in the project area. Mitigation measures were added for the retention of unthinned clumps to maintain foraging habitat for fishers. Therefore, the actions proposed for the Five Buttes would only contribute short-term effects to those described for the Three Trail OHV analysis. Long-term negative effects to fishers and fisher habitat is not projected because the Three Trails OHV analysis concludes planned road and trail closures and improved habitat quality would result in a beneficial impact to the species.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

## Regional Forester's Sensitive Species

Species classified as sensitive by the Forest Service are to be considered by conducting biological evaluations (BE) to determine potential effects of all programs and activities on these species (FSM 2670.32). The BE is a documented review of Forest Service activities in sufficient detail to determine how a proposed action may affect sensitive wildlife species.

The Regional Forester's Sensitive Species list was updated in January 2008 and Table 57 includes all animal species documented or suspected to occur on the Deschutes National Forest and their status within the Three Trails OHV project area using the 2008 updated list.

**Table 57. Regional Forester Listed Sensitive Animal Species for the Deschutes National Forest**

| Species | Listing Status | Habitat | Presence Within Three Trails Analysis Area |
|---|---|---|---|
| Bald Eagle (*Haliaeetus leucocephalus*) | Regional Forester Sensitive | Lakes, Reservoirs, Large Trees for Nesting | Observations - No Known Nests |
| Horned Grebe (*Podiceps auritus*) | Regional Forester Sensitive | Lakes | No Habitat |
| Red-necked Grebe (*Podiceps gisegena*) | Regional Forester Sensitive | Lakes | No Habitat |
| Bufflehead (*Bucephala albeola*) | Regional Forester Sensitive | Lakes, Rivers, Snags | Unknown |
| Harlequin Duck (*Histrionicus histrionicus*) | Regional Forester Sensitive | Fast Flowing Streams | Unknown |
| American Peregrine Falcon (*Falco pergrinus anatum*) | Regional Forester Sensitive | Cliffs, Riparian | No Habitat |
| Tricolor Blackbird (*Agelaius tricolor*) | Regional Forester Sensitive | Lakeside, Bulrushes | Unknown |
| Lewis' Woodpecker (*Melanerpes lewis*) | Regional Forester Sensitive | Open wouldland habitat (oak, ponderosa, or cottonwould) near water | Documented |
| White-Headed Woodpecker (*Picoides albolarvatus*) | Regional Forester Sensitive | Ponderosa pine or mixed conifer forests dominated by ponderosa pine | Documented |
| Northern Waterthrush (*Seiurus aurocapillus*) | Regional Forester Sensitive | Riparian hardwoods (willows) | Documented |
| Western Sage Grouse (*Centrocercus urophasianus phaeios*) | Regional Forester Sensitive | Sagebrush | No Habitat |
| Yellow Rail (*Coturnicops noveboracensis*) | Regional Forester Sensitive | Marshes | No Habitat |
| California Wolverine (*Gulo gulo*) | Regional Forester Sensitive | Mixed Forest, High Elevations | Unknown |
| Pygmy Rabbit (*Brachylagus idahoensis*) | Regional Forester Sensitive | Sagebrush Flats | No Habitat |
| Townsend's Big-Eared Bat (*Plecotus townsendii*) | Regional Forester Sensitive | Roost sites in buildings, caves and bridges | No Habitat |
| Crater Lake Tightcoil Snail (*Pristiloma arcticum crateris*) | Regional Forester Sensitive | Riparian | Unknown |
| Silver-Bordered Fritillary (*Boloria selene*) | Regional Forester Sensitive | Wet meadows, marshes, bogs and more open parts of shrubbier wetlands | Unknown |

| Species | Listing Status | Habitat | Presence Within Three Trails Analysis Area |
|---|---|---|---|
| Johnson's Hairstreak (*Callophrys johnsoni*) | Regional Forester Sensitive | Mostly in old growth coniferous forests with mistletoe presence | Unknown |

After a review of existing records, habitat requirements, and existing habitat components, it was determined that the following sensitive species have habitat present in the project area or are known to occur and would be included in this analysis: Northern bald eagle (*Halaieetus leucocephalus*), Bufflehead (*Bucephala albeola*), Harlequin (*Histrionicus histrionicus)*, Tricolor blackbird (*Agelaius tricolor)*, Lewis' woodpecker (*Melanerpes lewis*), White-headed woodpecker (*Picoides albolarvatus*), Northern waterthrush (*Seiurus aurocapillus*), California wolverine (*Gulo gulo*), Crater Lake tightcoil (*Pristiloma arcticum crateris*), Silver-bordered fritillary (*Boloria selene)*, and Johnson's hairstreak (*Callophrys johnsoni*).

**Summary of Conclusions for Sensitive Species**

1. There is no habitat present and/or the following species are not expected to occur within the project area and therefore, were not analyzed: horned grebe, red-necked grebe, peregrine falcon, western sage grouse, yellow rail, pygmy rabbit, and the Townsend's big-eared bat.
2. The selection of any alternative (B, C, D, or E) would have **"No Impact"** on the bald eagle, harlequin, peregrine falcon, Tricolor blackbird, Lewis' woodpecker, white-headed woodpecker, northern waterthrush, California wolverine, Crater Lake tightcoil, and the silver-border fritillary.
3. Alternative C "**May Impact Individuals or Habitat, But Would Not Contribute To a Trend Toward Federal Listing or Loss of Viability To The Population or Species"** for the northern waterthrush.
4. The No Action alternative would have **"No Impact"** to the Johnson hairstreak.
5. The action alternatives "**May Impact Individuals or Habitat, But Would Not Contribute To a Trend Toward Federal Listing or Loss of Viability To The Population or Species"** for the Johnson's hairstreak.
6. The Action Alternatives (B, C, D, and E) are expected to result in a **"Beneficial Impact"** to the bufflehead and northern waterthrush.

**Table 58. Summary of Conclusion of Effects to Region 6 Sensitive Animal Species.**

| Species | Alt. B | Alt. C | Alt. D | Alt. E |
|---|---|---|---|---|
| Bald Eagle | NI | NI | NI | NI |
| Horned Grebe | NI | NI | NI | NI |
| Red-necked Grebe | NI | NI | NI | NI |
| Bufflehead | BI | BI | BI | BI |
| Harlequin Duck | NI | NI | NI | NI |
| American Peregrine Falcon | NI | NI | NI | NI |
| Tricolor Blackbird | NI | NI | NI | NI |

| Species | Alt. B | Alt. C | Alt. D | Alt. E |
|---|---|---|---|---|
| Lewis' Woodpecker | NI | NI | NI | NI |
| White-Headed Woodpecker | NI | NI | NI | NI |
| Northern Waterthrush | BI | BI | BI | BI |
| Western Sage Grouse | NI | NI | NI | NI |
| Yellow Rail | NI | NI | NI | NI |
| California Wolverine | NI | NI | NI | NI |
| Pygmy Rabbit | NI | NI | NI | NI |
| Townsend's Big-Eared Bat | NI | NI | NI | NI |
| Crater Lake Tightcoil Snail | NI | NI | NI | NI |
| Silver-Bordered Fritillary | NI | NI | NI | NI |
| Johnson's Hairstreak | MIIH | MIIH | MIIH | MIHH |

NI = No Impact
MIIH = May impact individuals or habitat, but would not likely contribute to a trend toward federal listing or loss of viability to the population or species
BI = Beneficial Impact

The following species were determined not to occur in the project area based on a lack of existing sighting information, a review of habitat requirements, and habitat types present in the project area. These species would not be included in any further analysis: Horned grebe (*Podiceps auritus*), Red-necked grebe (*Podiceps grisgena*), peregrine falcon (*Falco peregrines anatum*), Tricolor blackbird (*Agelaius tricolor)*, Western sage grouse (*Coturnicops noveboracensis*), Yellow rail (*Coturnicops noveboracensis*), Pygmy rabbit (*Brachylagus idahoensis)*, and the Townsend's big-eared bat (*Plecotus townsendii*).

The horned and red-necked grebes nest in lakes and ponds with tall vegetation or marshy habitats. The project area does not contain any lakes or ponds that could potentially provide nesting habitat for either species. While the horned grebe has been documented to occur on Big Lava Lake on the Deschutes National Forest (Marshall et al. 2003) there are no known breeding locations of either species on the forest. Implementation of any alternative would have "**No Impact"** on the horned grebe and red-necked grebe.

In Oregon peregrine falcons occur as resident and migratory populations. They nest on cliffs greater than 75 feet in height and within one mile of some form of water (Pagel 1992). Nesting occurs in xeric areas of eastern Oregon, marine habitats of western Oregon, montane habitats to 6,000 feet elevation, small riparian corridors statewide, and more recently urban habitats of the lower Willamette and Columbia Rivers. Riparian corridors are used for travel and as hunting areas (90-95 percent of all prey items are birds that may come from these systems, Pagel 1992). While there is one known peregrine falcon eyrie located in 2008 on the Sisters Ranger District of the Deschutes National Forest none have been reported on the Crescent Ranger District. Within the Three Trails OHV analysis area there is no suitable cliff

habitat that could function as nesting habitat. Implementation of any alternative would have "**No Impact**" on the peregrine falcon.

Western sage grouse are found in foothills, plains, and mountain slopes where sagebrush is present and the habitat contains a mixture of sagebrush, meadows, and aspen in close proximity. Winter habitat containing palatable sagebrush probably is the most limited seasonal habitat in some areas (NatureServe 2008). While this habitat type and sage grouse are known to occur on the Deschutes National Forest, this habitat type does not occur within the project area or the Crescent Ranger District. Implementation of any alternative would have "**No Impact"** on the western sage grouse.

From information gathered over the last 6-7 years, nesting habitat for the yellow rail in Oregon has been described as marshes or wet meadows which have an abundance of thin-leaved sedges, a layer of senescent vegetation to conceal their nests, and an average water depth of seven centimeters. (Popper 2001). Winter habitat is thought to occur along the California coast although more research is needed to confirm this (Popper 2001). A very small breeding population of yellow rails (2-5 pairs annually) is known to occur on Big Marsh on the Crescent Ranger District based on information gathered since 1997 (Popper 2004). Within the project area wet meadow habitat is present in the Hemlock Creek/Swamp Creek, Spruce Creek confluence. However, this meadow complex does not contain the necessary vegetative species needed for breeding yellow rail habitat. Implementation of any action alternative would have **"No Impact"** on the yellow rail.

Pygmy rabbits typically occur in dense stands of big sagebrush growing in deep loose soils (NatureServe 2008). This habitat type does not occur within the project area. Implementation of any alternative would have **"No Impact"** on the pygmy rabbit.

Townsend big-eared bat maternity and hibernation colonies are typically in caves and mine tunnels. They roost almost exclusively in cavity roosts, both in human-made structures (that is, buildings, bridges, and mines) and caves (Christy and West 1993). They are extremely sensitive to disturbance while roosting, because they hang directly from the ceiling of the roost and do not go into torpor (temporary hibernation) during the day in summer colonies (Barbour and Davis 1969; and Dalquist 1948 cited in Christy and West 1993). Perkins and Levesque (1987) estimated the Oregon population at 2,300-2,600 bats and Gaines (1997 cited in NatureServe 2008) estimated 3,000-5,000 individuals in Oregon. The species range extends from southwestern British Columbia, western Washington, western and central Oregon, and northwestern and west-central California. NatureServe (2009) gives them a status of S2, Imperiled in the state of Oregon. The greatest threat to the species is vandalism and disturbance by humans. Disturbance of a nursery colony or of a hibernating group is likely to cause the bats to abandon the site and move to an alternate roost. An additional threat is blockage of cave/mine entrances through collapse or human activities (NatureServe 2009). There are no known caves or mines on the Crescent Ranger District (L. Hickerson, pers. comm. 2008) and there are no documented reports of Townsend's big-eared bats occurring on the district. The selection and implementation of any alternative would have "**No Impact**" on the Townsend's big-eared bat.

**Northern Bald Eagle (*Haliaeetus luecocephalus*), *R6 Sensitive, MIS***

The northern bald eagle was officially de-listed as a federal threatened species on August 8, 2007. The Federal Register (Vol. 72, No. 130/Monday July 30, 2007) stated the bald eagle has made a dramatic resurgence from the brink of extinction. The banning of DDT, couple with cooperative conservation efforts of the Service, States, other Federal agencies, non-government organizations, and individuals, have all contributed to the recovery of our National symbol. While the bald eagle has been de-listed they are still protected under the Bald and Golden Eagle Protection Act of 1940. This law provides for the protection of bald eagles and the golden eagle by prohibiting the take, possession, sale, purchase, barter, offer to sell, transport, export or import, of any bald or golden eagle, dead or alive, including any part,

nest, or egg, unless allowed by permit (16 U.S.C. 668(a); 50 CFR 22). The U.S. Fish and Wildlife Service (2007) has prepared Bald Eagle Management Guidelines to help landowners, land managers, and others to meet the intent of this Act. In addition, monitoring of selected bald eagle nest sites would continue to occur including sites on national forest system lands.

The Deschutes National Forest Land and Resource Management Plan (LRMP) also provides direction for the management of habitat through the designation of Bald Eagle Management Areas (BEMAs). Management direction in the LRMP for BEMAs permits pre-commercial thinning and timber harvest to achieve eagle habitat objectives. In catastrophic situations all efforts are to be made to protect or create suitable eagle habitat (Deschutes LRMP M3-4, 5, 6, 7 p. 4-94). It also calls for protection of all existing nest, roost, and perch trees which are defined as 110 feet in height and 40 inches or greater in diameter (Deschutes LRMP M3-11, 12, page 4-95). Site specific BEMA plans have also been prepared by district personnel for nest sites near Wickiup Reservoir, Davis Lake, Crescent Lake, and Odell Lake.

**Ecology:** A detailed account of bald eagle habitat requirements can be found in the Pacific Bald Eagle Recovery Plan (USDI 1986). Bald eagle nesting territories are normally associated with lakes, reservoirs, or rivers. Nests are usually located in large conifers in uneven-aged, multi-storied stands with old-growth components (Anthony et al. 1982). Nest trees usually provide an unobstructed view of the associated body of water. Live, mature trees with deformed tops are often selected for nesting. East of the Cascade Mountains in Oregon, bald eagles prefer nesting in ponderosa pine trees that average 46 inches in diameter (range 21-76 inches) and tend to be larger than the surrounding trees (Anthony et al. 1982).

**Existing Condition:** Table 59 displays the results of nesting surveys conducted on the Crescent Ranger District by Frank Isaacs (Isaacs and Anthony 2008) and by district personnel over the last 10 years. Nesting surveys were conducted in the spring of 2009 to contribute to post de-listing monitoring data.

**Table 59. Bald Eagle Nest Territories and Historical Nesting Status 2001-2010 for Territories on the Crescent Ranger District**

| Territory Name | Year First Located | Status 2001 | Status 2002 | Status 2003 | Status 2004 | Status 2005 | Status 2006 | Status 2007 | Status 2008 | Status 2009 | Status 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Round Swamp** | 1971 | F | 2 | 2,ND/n* | 2/s | 1 | oF | oF | oF | 2 | oF |
| **Wickiup South** | 1978 | oF | oF | oF | 2 | 2 | 1 | 1 | 1 | 1 | oF |
| **Lava Flow** | 1993 | 2 | 2 | 1 | oF | oF | 1 | oF | oF | oF | oF |
| **Davis SE** | 1971 | *2 | oF | 2/n | 1/s | 2 | oF | 2 | 1 | 2 | 2 |
| **Davis W** | 1985 | al | 1 | 1 | 2 | 1 | 1 | oF | oF | oF | 1 |
| **Davis NW** | 1973 | 1 | oF | 1/n | *oF | 2 | 1 | oF | oF | oF | oF |
| **Odell SE** | 1976 | oF | 1 | F | 1 | 1 | 1 | 2 | oF | 1 | oF |
| **Odell Creek/Resort Ridge** | 2004 | | | | 2 | 2 | oF | oF | oF | 1 | 2 |
| **Triple Thunder** | 1995 | 1 | 2 | oF | 1 | 2 | 2 | oF | oF | oF | 1 |
| **Odell NE** | 1979 | NL | NL | oF | oF | oF | 1 | oF | oF | 1 | 1 |
| **Odell NW** | 1976 | 2 | F/j | *2d | 1 | oF | 1 | oF | oF | 1 | oF |

| Territory Name | Year First Located | Status 2001 | Status 2002 | Status 2003 | Status 2004 | Status 2005 | Status 2006 | Status 2007 | Status 2008 | Status 2009 | Status 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pengra Pass** | 1998 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 |
| **Pebble Bay** | 1997 | 2 | 2/j | 2 | oF | oF | 2 | 2 | oF | oF | oF |
| **Chinquapin Point** | 2006 | | | | | | oF | 1 | oF | oF | 1 |
| **Odell/Hwy 58** | 2007 | | | | | | | 1 | oF | 2 | 2 |
| **Crescent Lake** | 1978 | F | 1 | oF | F | oF | oF | 1 | oF | oF | oF |
| **Tranquil Cove** | 2002 | | 1 | 2d | 1 | 2 | oF | 2 | oF | 2 | oF |
| **Total Young** | | 11 | 14 | 15 | 14 | 16 | 13 | 13 | 4 | 14 | 12 |

compilation from Isaacs and Anthony 2006 and survey results from 2007, 2008, and 2009

1or 2 = # young produced
oF = site occupied, nest failed
NL = nest not looked for or not located
1/s = 1 young, nest tree 100% dead
2/j = 2 young, camera installed after nesting season
*2 = 2 young, nest rebuilt since last observation
2/n = 2 young, nest burned in a fire
F = failed nesting
2,ND/n* = 2 young, nest down burned in a fire
RT = red-tailed hawk occupied the nest
al = alternate nest

In addition to nest site monitoring, a mid-winter survey is conducted in early to mid-January of each year to estimate the number of bald eagles wintering on Crescent Lake, Odell Lake, and Davis Lake. Over the last five years the annual mid-winter count of bald eagles has ranged from a low of 12 in 2007 to a high of 37 birds in 2006.

Within the Three Trails OHV project area there is one designated BEMA on the east side of Crescent Lake and one bald eagle nesting territory. The Viable program estimated there to be approximately 9,832 acres of National Forest System lands with trees exceeding 30 inches in diameter diameter large enough to support a nest structure. However, the modeling mapped stands further than ½ mile from the Crescent and Odell lakes. This is the maximum distance from lakes and reservoirs bald eagle nests have been documented on the Crescent District. The bald eagle observations that have been documented in the project area are most likely associated with established nesting territories on Crescent Lake and Odell Lake. While the Little Deschutes River bisects the analysis area there are no known nests and it is unlikely this area could support a nest territory based on a limited forage base the river and surrounding area could provide during the nesting season.

***Environmental Consequences***

**Alternatives A – Existing Condition**

As shown in Table 59 bald eagle nesting success based on the number of fledglings produced has been relatively constant over the last ten years. The late winter and early spring of 2008 had severe weather conditions with cold and heavy snow accumulations that may have contributed to reduced success that year. During the last decade three new nesting pairs became established on Odell Lake with the population growing consistent with the rest of state of Oregon (Isaacs and Anthony 2008).

Use of Maintenance Level 1 roads and user-created trails and roads would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest.

**Effects Common to All Action Alternatives (B, C, D, and E)**
None of the action alternatives propose the construction of any new trail nor designate any open road within the Crescent Lake East BEMA as part of the Three Trails OHV trail system. In addition, only an approximate ½ mile of new trail construction is proposed for Alternatives C, D, and E that would run from Forest Road 6015 south to Forest Road 6020. None of this new trail segment would enter the BEMA and is also greater than ½ mile from the nearest bald eagle nest on Crescent Lake. In addition, where tree removal may be needed for new trail construction it is expected most trees would be less than six to eight inches in diameter. Trees large enough to support a bald eagle nest would not be removed. There also no known bald eagle roosts within the project area aside from the known nest trees. Consequently, there would be no impact to any nesting or roosting habitat associated with new trail construction.

Associated actions with the Three Trails OHV project include the closure of user-created trails and roads not needed for the trail system. Rocks, boulders, logs and/or subsoiling could be employed to close these areas to motorized travel. Any rehabilitation actions with the potential to create disturbance to nesting bald eagles would have a limited operating period in place to avoid adversely impacting the birds (see Project Design Features in Chapter 2). There are also no staging areas or viewpoints within the Crescent Lake East BEMA or potential nesting habitat (< ½ mile) from Odell or Crescent Lakes that could cause an impact to nesting bald eagles or their habitat. The last associated action is the construction of a bridge over the Little Deschutes River in Alternative C. This activity would not impact bald eagles because there are no known bald eagle nests in this area, no BEMAs are present, and it is highly unlikely a pair would choose to nest in this location because of the lack of a reliable, sufficient forage base.

The combination of actions proposed for the Three Trails OHV project would result in a determination of **"No Impact"** to the bald eagle and therefore, are also no cumulative effects with the selection of any action alternative.

It is estimated that in early 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

**Bufflehead (*Bucephala albeola*) , *R6 Sensitive, MIS***
**Ecology:** The bufflehead is North America's smallest diving duck. It winters throughout Oregon but is an uncommon breeder in the central and southern Cascades (Marshall 2003). Known nest sites in central and southern Oregon include Hosmer Lake, Crane Prairie Reservoir, Twin Lakes, Wickiup Reservoir, Davis Lake and along the Little Deschutes River in Deschutes County. Broods have also been reported in small lakes near the crest of the Cascades in western Deschutes County. The bufflehead would use tree cavities or artificial nest boxes in trees close to water. Marshall (1996) stated that human disturbance from high recreation use at Cascade Lakes and a shortage of suitable nesting cavities due to forestry practices may be having an impact on their population status. The Oregon breeding population is considered sensitive by the ODFW because of small size and limited nesting habitat (Marshall et al 2003).

On the Crescent Ranger District buffleheads are commonly seen on Odell Lake, Crescent Lake, Davis Lake, and nearby Wickiup Reservoir nearly year-round or until freeze-up. They have also been observed on some of the high elevation lakes and ponds in the Oregon Cascades Recreation Area during the summer months. Marshall et al. (2003) reported the Little Deschutes River in Deschutes County, Oregon as a known breeding site. While there are no reports of buffleheads within the Three Trails OHV project area approximately five miles of the Little Deschutes River flows through National Forest System lands in the project area. Older forested stands adjacent to the river may provide snag habitat for this cavity

nester. The same five miles of river corridor has roads, user-created OHV trails, and several dispersed campsites used during the summer months and fall hunting seasons. It is currently unknown what level of impact may be occurring to nesting buffleheads if present along this segment of the river.

***Environmental Consequences***

**Alternative A - Existing Condition**

The selection of this alternative would result in no direct effects to the bufflehead because no new OHV trails or closed roads would be opened or developed within the riparian zone of the Little Deschutes River. While motorized use would continue to occur, direct access to the river is restricted to only a couple of dispersed campsites along the Little Deschutes River south of Highway 58 in the project area. Further south along the river, topography has restricted the development of roads and trails. This is assumed to allow waterfowl, including the bufflehead, greater use of the riparian zone and river for nesting and foraging with less human disturbance compared to where roads access the river. Because of the known recreational use of the riparian zone during the breeding season it is assumed the selection of this alternative may result in some level of disturbance to nesting buffleheads, if present, along the Little Deschutes River corridor although as previously mentioned buffleheads are known to occur on several lakes on the Crescent District.

Future use of Maintenance Level 1 roads and user-created roads and trails would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest

**Effects Common to All Action Alternatives (B, C, D, and E)**

Korschgen and Dahlgren (1992) reviewed 21 journal articles on human disturbance of waterfowl and compiled and reported that waterfowl are wary, seeking refuge from all forms of disturbance, particularly those associated with loud noise and rapid movement. Activities along shorelines such as fishing, birdwatching, hiking, and traffic were noted as disturbances to waterfowl although to a lesser degree compared to rapid overwater movement and loud noise; sailing, windsurfing, rowing or canoeing, wading, and swimming. Disturbance effects can include increased rate of nest desertion and/or reduced hatching rate, both of which can lead to a declining population.

Each action alternative proposes to reduce the amount of user-created trails in the riparian zones of Three Trails OHV project area from a current 13.26 miles to a range of 3.06 miles in Alternative B, 2.25 miles in Alternative C, 1.12 miles in Alternative D, and 1.14 miles in Alternative E although designated roads would continue to allow public access to the river. Rehabilitation actions associated with the road/trail closures includes the placement of rocks/boulders and/or logs and subsoiling may also occur to close these routes to motorized travel. These actions have the potential to create short-term disturbance to nesting buffleheads if in the area during the nesting season. However, overall road/trail closings would result in a reduction of motorized use within the riparian zone of the river corridor that would benefit the species. Even though there is a projected 2.5-5.6 percent annual increase in OHV use as the system becomes more widely known this would be restricted to those roads and trails that are open for motorized use. In addition, no new trail construction would occur that could result in snag loss allowing the species full use of the existing snags present along the Little Deschutes River. While trail maintenance is projected to annually remove five to ten snags that may be leaning over the trail system and cause a safety hazard to riders, this level of snag removal on a 93,016 acre project is so small it cannot be quantified. Associated actions associated with Three Trails OHV project include the creation of staging areas for trail riders although are planned along the Little Deschutes River so no impacts would occur from this activity. There are also no viewpoints planned along the river corridor and consequently no impacts from this action either. Alternative C also proposes the construction of an ATV bridge over the Little Deschutes River south of the Two River North subdivision. Because the bridge would cross the river perpendicularly, this would minimize impacts within the riparian zone as compared to retaining roads/trails that parallel the river. This action would not create adverse effects to the species.

**Determination**
The determination for Alternatives B, C, D, and E is **"No Impact"** to the bufflehead duck or their habitat. Because no effects are anticipated there would also be no cumulative effects.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

**Harlequin Duck (*Histrionicus histrionicus*), *R6 Sensitive, MIS***
**Ecology*:*** The Harlequin duck nests along fast-flowing rivers and mountain streams in the Cascade Mountains of Oregon and Washington. There are no confirmed breeding sites in the east Cascades of Oregon with the exception of the Hood River basin (Marshall et al. 2003). Harlequin broods have been documented in northeast Oregon. In the western Cascades of Oregon breeding pairs are observed on low to moderate gradient (1-7 percent) third to fifth-order streams in the western hemlock zone with simple channels and abundant in-stream rocks for loafing sites (Marshall et al. 2003). Nests are scooped depressions lined with down. Bruner (1997 in Marshall et al. 2003) stated 35 percent of his located nests were placed on exposed shelves of logs or root wads and 65 percent were found on natural ledges on slopes or cliffs within 1-82.5 feet of water. On the breeding range, foraging occurs on stream invertebrates such caddisflies and stoneflies. Non-breeding adults can be found along the Oregon coast and the winter population includes migrant birds. They are often seen resting on rocks at high tide and feeding about exposed rocks at low tide (Gilligan et al. 1994). Threats to the species may include recreation related disturbances and oil spills. Direct effects of timber harvesting, mining, road building, or other activities have not been documented (Marshall et al. 2003).

Potential breeding habitat may exist on the Crescent Ranger District in the upper Little Deschutes River canyon and Crescent Creek. At the present time there are no documented sightings of harlequin ducks on the Crescent District although there have been no formal surveys conducted by district personnel to determine their presence. It is unknown if the private lands along the Little Deschutes River corridor provide any potential nesting and brood rearing habitat for harlequins.

***Environmental Consequences***
**Alternative A – Existing Condition**
This selection of this alternative would result in no change from the existing condition. All user-created trails and existing roads would assume to be open and accessible for all motorized users including the 13.26 miles of user-created trails currently known within riparian zones of the project area. Although the species is not known to exist on the district the high level of recreational activity including motorized access would continue to occur potentially resulting in disturbance during the nesting and brood rearing period.

Future use of Maintenance Level 1 roads and user-created roads and trails would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest.

**Effects Common to All Action Alternatives**
None of the action alternatives propose the creation of new OHV trails within riparian habitat along Crescent Creek and only Alternative C proposes the creation of a new trail that would cross the Little Deschutes River south of the Two Rivers North subdivision. This would require the construction of an ATV bridge over the river. All action alternatives also result in the reduction of user-created trails within the riparian zones of the project area from a current total of 13.26 miles in Alternative A to 3.06 miles in Alternative B, 2.25 miles in Alternative C, 1.12 miles in Alternative D and 1.14 miles in Alternative E.

While motorized access would still be provided, all action alternatives result in a reduced level of motorized access within riparian zones and access to the river is still possible through designated trails. Associated actions include the rehabilitation of user-created trails and roads through rock/boulder placement, blocking logs, and/or subsoiling. These actions may create some additional short-term disturbance to harlequins if present during construction activities but would result in long-term improvements to the riparian zones by reducing disturbance. It is also projected that there OHV use will increase 2.5 to 5.6 percent each year as the trail system becomes more widely known. However, this use would still be restricted to those roads and trails authorized for motorized travel and still result in the reduction in riparian motorized routes described above. No formal harlequin surveys have been conducted and district personnel have not reported any observations of this species while conducting Forest Service work activities for decades in this area. At the present time, this species is not thought to be present in either Crescent Creek or the Little Deschutes River corridor.

**Determination**
The determination for Alternatives B, C, D, and E is **"No Impact"** to the harlequin duck or their habitat. Because no effects are anticipated there would also be no cumulative effects.

It is estimated that in early 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

**Tricolored Blackbird (*Agelaius tricolor*), R6 Sensitive**
**Ecology**: The Tricolored blackbird is a highly gregarious colonial breeder largely endemic to California. However, breeding colonies are scattered and intermittent in Oregon. In Oregon they breed most consistently in southern Klamath County in the southern part of the state. There are no records of nesting Tricolored blackbirds in northern Klamath County where the Three Trails OHV analysis area is located. Nesting occurs in fresh-water marshes of cattails, tules, bulrushes and sedge, or in thickets of willows or other shrubs. Most birds in Oregon migrate to California for the winter. Threats to this species include habitat loss due to drainage of wetlands and conversion of former nest and roost sites to agriculture. Human disturbance has also been implicated in nesting colony abandonment or failure (Marshall et al. 2003). The Oregon population was estimated to have declined by 22 percent in the 1980s but the Oregon population represents only one percent of the total tricolored blackbird population (Beedy et al. 1999). The species currently holds rankings in Oregon as SP Sensitive (peripheral or naturally rare) and by the Natural Heritage program as G3 Vulnerable – either rare throughout its range or found locally in a restricted range.

There are no documented sightings of tricolored blackbirds on the Crescent Ranger District although potentially suitable nesting habitat is present within and outside the project area. The Little Deschutes River corridor below Highway 58 within the project area with its expanses of dense willow thickets may represent suitable nesting habitat. However, K. Spencer (pers. comm. 2009) surveyed this area in 2008, 2007, 2006, 2003, 1999, 1995 and reported no observations or vocalizations of Tricolored blackbirds. District wildlife personnel have not conducted any formal surveys for this species on the Crescent Ranger District.

***Environmental Consequences***
**Alternative A –Existing Condition**
While this species is known to be sensitive to human disturbance (Marshall et al. 2003) it has not been documented to occur in the north end of Klamath County where the Three Trails OHV project is located. Selection of Alternative A would result in no change within the Little Deschutes River corridor that may

potentially provide nesting habitat for this species. At the present time, there are 13.26 miles of user-created trails within the riparian zones of the project area which includes the Little Deschutes River. With this alternative motorized use of existing roads and user-created trails would be expected to continue for day use recreational riding and from dispersed campsites although not thought to be currently having any impacts based on species absence from Spencer's breeding bird surveys (2009).

Future use of Maintenance Level 1 roads and user-created roads and trails would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest.

**Effects Common to All Action Alternatives**
All four action alternatives propose the creation of an identified OHV area available for Class I, II, and III users including the incorporation of staging areas though none are proposed along the Little Deschutes River. The development of an OHV system would include closure of existing user-created trails unless needed, conversion of some roads to trails, and also incorporates some level of road closures within each alternative. The rehabilitation of user-created trails and roads could include some or all of the following: placement of rocks/ boulders to restrict access, using logs to block trails, and/or subsoiling with native revegetation to restore habitat. These actions would have the potential to impact nesting tricolored blackbirds although the species is not thought to be currently occupying the willow thickets along the Little Deschutes river corridor. All four action alternatives would also result in a reduction of riparian area motorized roads/trails from a current level of 13.26 total miles to 3.06 miles (Alternative B), 2.25 miles (Alternative C), 1.12 miles (Alternative D) and 1.14 miles in Alternative E. Alternative C also proposes the placement of an ATV bridge over the Little Deschutes River south of the Two Rivers North subdivision though this action is also not projected to impact the species based on breeding bird survey work. While OHV use is projected to increase 2.5 to 5.6 percent a year all the increase would still be restricted to those roads and trails open for motorized use. As described above roads and trails within riparian areas would decrease dramatically.

**Determination**
Because this project would not result in a loss of nesting habitat and the lack of documented species observations or vocalizations, implementation of any action alternative (B, C, D, or E) of the Three Trails OHV project has been determined to have "**No Impac**t" on the Tricolored blackbird. Because no effects would occur, there are no cumulative effects.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

**Lewis' Woodpecker (*Melanerpes lewis*), R6 Sensitive, MIS**
**Ecology:** This woodpecker is a medium-sized, vaguely crow-like bird that relies on flycatching during the spring and summer and stored mast and fruits in the fall (Marshall et al. 2003). It breeds in low numbers in open habitats along eastern Oregon rivers and stream valleys including the lower Deschutes River. The species is most common in open habitats (e.g. burns) in and near Cascade forests. Wisdom (2000) reported that burned ponderosa pine forest created by stand-replacing fires provide highly productive habitats as compared to unburned pine. They are not considered strong cavity excavators but require large snags in an advanced stage of decay that are easier to excavate. Lewis' woodpeckers would also use old cavities created by other woodpeckers. Forty-two percent of the nest trees on the eastern edge of the Mt. Hood National Forest were in ponderosa pine (typically snags) and 43 percent were in living and declining Oregon white oak. The mean diameter of nest trees was 26 inches and mean nest tree height was 41 feet (Marshall et al. 2003). Haggard and Gaines (2001) determined that the Lewis'

woodpecker was most abundant in low snag density stands within a stand replacement fire study conducted on the Wenatchee National Forest in Washington. Marshall et al. (2003) reports the species is declining throughout its range possibly due to loss of suitable habitat, competition for nest holes, and the effects of pesticides.

The Viable Ecosystem model was used to map suitable nesting habitat defined as open forested stands with less than 40 percent canopy in the lodgepole pine and dry ponderosa pine PAGs with trees greater than 15-20 inch diameter. There is an estimated 1,043 acres of this habitat on National Forest System lands in the very southeastern corner of the analysis area and east of Highway 97. This figure accounts for all past and present timber sales, natural events such as wildfires, and any other habitat altering activity including the construction of roads over the last four to five decades. The minimal number of acres of habitat in the analysis area is primarily due to most ponderosa pine stands being densely stocked and not providing the more open forest this species prefers for nesting. Habitat acreage is likely on an increasing trend over the last decade or two as commercial and small-diameter tree cutting has reduced tree density and combined with prescribed underburning to lower canopy cover levels. Privately owned lands in the project area likely have few stands with trees greater than 15-20 inches diameter that could provide habitat for this species. The Muttonchop Fire of 2000 (within the project area) was a stand replacement event on a ponderosa pine dominated site. No salvage harvesting was conducted and represents an approximate 80 acres of potential nesting habitat. Existing district wildlife sighting records show two observations of Lewis' woodpeckers in the analysis area both east of Highway 97 and west of Walker Rim. One of the observations was on privately owned industrial timberlands but near the National Forest boundary. Outside the analysis area Lewis' woodpeckers have been recently detected within the 21,000 acre Davis Fire.

***Environmental Consequences***

**Effects Common to All Alternatives**

Hamann et al. (1999) and Gaines et al. (2003) conducted literature reviews of recreational associated effects on wildlife including studies on woodpeckers and other cavity nesting birds. Their reviews of existing published literature showed that recreational trail-associated disturbances did not present a problem to woodpeckers and cavity nesters as a group. Hamann et al. (1999) also stated that recreational activity is unlikely to be focused around nest sites of these species and by design woodpeckers and other cavity users are relatively more secure from nest predation than any other group of forest birds. Therefore at the present, recreational disturbance is not known to be a major limiting factor.

Altman in the Landbird Conservation Strategies for the East-Slope Cascades (2000) recommended the retention of greater than one ponderosa pine snag per acre greater than 40 feet tall and 30 inches in diameter and an open overstory with a mean canopy cover less than 40 percent. No snags would be intentionally targeted for felling with the exception of hazard trees or snags near a trail or staging areas. Project design and layout would minimize the loss of existing snags and this would be consistent with the recommendations by Altman (2000).

Associated actions of the Three Trails OHV project includes the construction of staging areas to provide parking and may also include other amenities such as fire rings, toilets, picnic tables, and OHV learner loops for kids with staging areas running from three to five acres in size for a fully developed site down to one to two acres for less developed sites. Alternative C would propose up to nine staging areas, five in Alternatives D and E, Four in Alternative B and one currently exists at Crescent Lake Junction. It is assumed snag felling would be completed as needed for designated staging areas. However, none would be placed in ponderosa pine stands currently defined as providing nesting habitat for Lewis' woodpeckers. Trail maintenance requirements would also permit the removal of hazard trees (snags) that are leaning over the trail and be a hazard to riders however, this is estimated to be less than five to ten snags removed per year based on maintenance conducted for OHV trails on the Bend/Ft. Rock Ranger

District of the Deschutes National Forest. Also proposed is the construction of an OHV bridge over the Little Deschutes River although snag felling would not be needed for this project. Rehabilitation of user-created trails and roads would occur that are not needed for an OHV trail system. Placement of rocks, boulders, logs, and subsoiling as needed would be utilized to restore lands currently impacted by trails and prohibit motorized travel on these areas.

**Determination**
Current literature reviews state that the woodpecker guild is not known to be disturbed from recreational trail users and Project Design Features have been incorporated to retain snags except those deemed to be a hazard to trail riders or where staging areas would be located. The numbers of snags potentially removed would be minimal within the suitable nesting habitat and so small across the 93,016 acre project area it could not be quantified. While there is a projected 2.5 to 5.6 annual increase in OHV use they would still be confined to the designated trail system. Because snag felling is not permitted in district wood cutting areas there is no potential for habitat loss with this activity. Based on this rationale, the selection of any alternative would lead to a determination of "**No Impact**" to the Lewis' woodpecker. Because no effects are anticipated, there are no cumulative effects.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

**White-Headed Woodpecker (*Picoides albolarvatus*), R6 Sensitive, MIS**
**Ecology:** The white-headed woodpecker is a medium sized bird and unique because of striking plumage with a mostly white head with males having a red patch on the nape. They are a resident of montane forests from southern interior British Columbia south through central Washington, northern Idaho, east and southwest Oregon, north and central California, and the eastern edge of central Nevada to the mountains of southern California (Marshall et al. 2003). The presence of old growth pine is thought to be important to white-headed woodpeckers. Larger diameter pines provide bark crevices for the invertebrate prey of white-headed woodpeckers and are good cone producers. During the winter months they rely on seeds from ponderosa pine and sugar pine. Old-growths stands also have greater densities of the large-diameter snags that white-headed woodpeckers appear to select for nesting (Frenzel 2002). He also reported that the presence of sugar pine may be important at high elevation sites as an alternate food source. They usually excavate nest cavities in snags, but other recorded substrates include stumps, leaning logs, and the dead tops of live trees. Frenzel's study area on the Deschutes and Winema National Forests (2002) determined that nest trees ranged from 23.6 to 118.1 cm (9-46 inches) with an average diameter of 27 inches and 89 percent of the nest trees were in ponderosa pine. He also measured canopy closure at the nest tree which ranged from 0 percent to 57 percent with a mean of 13 percent.

Frenzel (2002) concluded population recruitment for this woodpecker was insufficient to offset mortality in his study areas on the Deschutes and Winema National Forests. He also reported that shrub growth, increased understory tree densities from fire suppression, may be factors affecting levels of mammalian nest predation and vulnerability of adults to avian predation. Marshall et al. (2003) stated that the long-term stability of this woodpecker in Oregon and Washington appears to rest with reversing the declining health of ponderosa pine forest.

The Viable Ecosystem model estimated there are approximately 1,120 acres of ponderosa pine, white fir, and Shasta red fir with the presence of ponderosa pine greater than 20 inch diameter with an open canopy condition defined as suitable nesting habitat. This figure accounts for all past and present timber sales, natural events such as wildfires, and any other habitat altering activity. The suitable habitat is located on

National Forest System lands in the very southeastern portion of the analysis area east of Highway 97 and closely overlaps with Lewis' woodpecker habitat. Habitat acreage is likely on an increasing trend over the last decade or two due to commercial and small-diameter tree cutting to reduce tree density and combined with prescribed underburning. These actions have lowered overall canopy cover closer to what the species prefers and also reduced the amount of bitterbrush and small diameter down wood in ponderosa pine stands that provides for small mammals that prey on white-headed nestlings. Privately owned land in the project area likely have few stands with trees greater than 15-20 inches diameter that could provide habitat for this species. District records list eleven observations of white-headed woodpeckers but no known nests in the Three Trails OHV analysis area. The observations are primarily within ponderosa pine stands east of Highway 97 and west of Walker Rim. One observation was noted just north of Crescent Lake Junction.

***Environmental Consequences***

**Effects Common to All Alternatives**

Hamann et al. (1999) and Gaines et al. (2003) conducted literature reviews of recreational associated effects on wildlife including studies on woodpeckers and other cavity nesting birds. Their reviews of existing published literature showed that recreational trail-associated disturbances did not present a problem to woodpeckers and cavity nesters as a group. Hamann et al. (1999) also stated that recreational activity is unlikely to be focused around nest sites of these species and by design woodpeckers and other cavity users are relatively more secure from nest predation than any other group of forest birds. Therefore at the present, recreational disturbance is not known to be a major limiting factor.

Altman (2000) in the Landbird Conservation Strategies for the East-Slope Cascades and white-headed woodpeckers recommended ponderosa pine stands have at least ten trees per acre, at least 21 inch diameter, of which two should be greater than 31 inches. There should also be at least 1.4 snags per acre, at least eight inches in diameter, with 50 percent having decay and an overall mean canopy closure of 10-40 percent. No snags would be intentionally targeted for removal with the exception of hazard trees or snags near a trail or staging areas. During project design and layout trail locations and staging areas would be placed to minimize the loss of snags. These measures would be consistent with the recommendations by Altman (2000).

Associated actions of the Three Trails OHV project includes the construction of staging areas to provide parking and may also include other amenities such as fire rings, toilets, picnic tables and OHV learner loops for kids with staging areas ranging from three to five acres in size for a fully developed site down to one to two acres for less developed sites. Alternative C would propose up to nine staging areas, five in Alternatives D and E, four in Alternative B and one currently exists at Crescent Lake Junction. It is assumed snag felling would be completed as needed for designated staging areas, however, none would be placed in ponderosa pine stands currently defined as providing nesting habitat for white-headed woodpeckers. Trail maintenance requirements would also permit the removal of hazard trees (snags) that are leaning over the trail and be a hazard to riders however, this is estimated to be less than five to ten snags removed per year based on maintenance conducted for OHV trails on the Bend/Ft. Rock Ranger District of the Deschutes National Forest. Also proposed is the construction of an OHV bridge over the Little Deschutes River although snag felling would not be needed for this project. Rehabilitation of user-created trails and roads would occur that are not needed for an OHV trail system. Placement of rocks, boulders, logs, and subsoiling as needed would be utilized to restore lands currently impacted by trails and prohibit motorized travel on these areas.

**Determination**

Current literature reviews state that the woodpecker guild is not known to be disturbed from recreational trail users and Project Design Features have been incorporated to retain snags except those deemed to be a hazard to trail riders or where staging areas would be located. The numbers of snags potentially removed

would be minimal within the suitable nesting habitat and so small across the 93,016 acre project area it could not be quantified. While there is a projected 2.5 to 5.6 annual increase in OHV use they would still be confined to the designated trail system. Because snag felling is not permitted in district wood cutting areas there is no potential for habitat loss with this activity. Based on this rationale, the selection of any alternative would lead to a determination of "**No Impact**" to the white-headed woodpecker. Because no effects are anticipated, there are no cumulative effects.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

**Northern Waterthrush (*Seiurus aurocapillus*), R6 Sensitive**

**Ecology:** The northern waterthrush is a small neotropical migrant that travels long distances nocturnally. Breeding habitat in North America includes Alaska and west to east across Canada extending into New England, the Mid-Atlantic States, the Great Lakes region, Montana, Idaho, North Dakota (NatureServe 2008) and a small area in the central Cascades of Oregon. It winters in the West Indies and Central and South America. The species has been known to occur along Crescent Creek and the Little Deschutes River near the communities of Crescent and Gilchrist, Oregon since 1977 (Contreras 1988). Marshall et al. (2003) states the northern waterthrush is one of Oregon's rarest and most local breeders. Occupied sites during the breeding season have also been identified at Salt Creek and Gold Lake on the Willamette National Forest (Contreras 1988). The birds in central Oregon seem to prefer dense riparian willow thickets and were usually found in willow clumps five to eight feet high, with some Sitka alder intermixed with small grassy patches and pools of water left in old stream meanders, although no nests have been found (Contreras 1988). Clutch size is four to five eggs sometimes three to six (NatureServe 2008). Mean territory size on breeding grounds ranges from 0.5-1.0 hectares (1.3-2.5 acres).

NatureServe (2009) lists the northern waterthrush as G5, Globally Secure and populations seem to holding steady and may be increasing in some regions. Survey-wide North American Breeding Bird Survey (BBS) showed no population trend, but in western North America, data indicated a significant increase. In Oregon the species is listed as S2, Imperiled. Threats to the species include pesticides and contaminants including spraying to control spruce budworm outbreaks.

Spencer (pers comm. 2009) conducted breeding bird surveys within the project area along the Little Deschutes River and Highway 58 crossing and confirmed waterthrush were present from observations or vocalizations from surveys in 2008, 2007, 2003 and 1995. Northern waterthrushes have also been documented on National Forest System lands near Crescent Creek and along the Little Deschutes River but outside the project area north of Gilchrist on private lands (K. Boucher, pers. comm. 2009). The full extent of potential breeding and occupied habitat along the Little Deschutes River in the analysis area is currently unknown. Marshall et al. (2003) reported that no population surveys have been done but in peak years birds are reported at all riparian access points within the Crescent Creek-Little Deschutes River portion of the species range. He also stated the central Cascade population appears to occupy essentially the same area it did in 1977-1978 with slight expansions and contractions over the years. Approximately 1.5 miles of the Little Deschutes River flows through private lands in the Two Rivers North subdivision. It is assumed that willow and bog birch is also present in this section of river although it is currently unknown if the northern waterthrush occupies these sites in addition to areas within National Forest System lands.

***Environmental Consequences***

**Direct and Indirect Effects**

**Alternatives A**

With this alternative there would be no change in recreational access along the five miles of the Little Deschutes River corridor although it is currently unknown if the species occupies this entire stretch of river. While there is no research on the species' sensitivity to disturbance the abundance of user-created of roads and trails would stay in place and remain a popular dispersed camping area during the summer and into the fall mushroom and big game hunting seasons. It is known dense willow thickets six to ten foot high are present in the riparian corridor tending to limit where human access is available to the river.

Future use of Maintenance Level 1 roads and user-created trails and roads would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest.

**Effects Common to All Action Alternatives B, C, D, and E**

These alternatives would designate a defined OHV trail system in the project area using user-created trails and roads, conversion of some roads to trails, and limited new trail construction. Those user-created trails and roads not needed for the trail system are proposed for closure using rocks, boulders, logs, and/or subsoiling to restore these lands and prohibit motorized use. The use of heavy equipment may be needed and if conducted during the spring and early summer breeding season have the capability to create some short-term disturbance while activities are on-going. There is currently a total 13.3 miles of user-created trail within the riparian reserves and would decrease to 3.1 miles in Alternative B, 2.2 miles in Alternative C, and 1.1 miles in Alternatives D and E which become part of the designated trail system. There would be no staging areas created along the Little Deschutes River where this species has been documented to occur. While OHV use is projected to increase 2.5 to 5.6 percent a year as the trail system becomes more widely known, use would still be restricted to those roads and trails only that are open for use. Because less motorized access is available this would translate into less human and motorized access into the dense thickets of willows where this species nests and much less potential for species disturbance.

Alternative C is similar in projected effects to Alternatives B, D, and E with the exception that C proposes the construction of an OHV trail over the Little Deschutes River south of the Two Rivers North subdivision. The bridge would accommodate ATVs up to fifty inches wide and would cross the river perpendicularly and minimize the amount of riparian disturbance as compared to Alternative A that would not close any roads or trails along the river corridor. The bridge would likely be suspended over some existing willows and bog birch which may be providing habitat and impact nesting pairs of waterthrush. However, it is estimated the amount of area impacted by the bridge would be less than one percent of the length of the Little Deschutes River corridor of the project area as opposed to the current condition where roads and/or trails follow the entire length of the river.

**Determination**

All action alternatives would lead to a trend in improving nesting habitat conditions for the waterthrush because of reduced human and motorized access into the river corridor. Therefore, the determination for Alternatives B, C, D, and E is **"Beneficial Effect"** for the northern waterthrush. There are no known additive effects associated with past, present, or foreseeable actions so cumulative effects are not anticipated to occur.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

**California Wolverine (*Gulo gulo*), *R6 Sensitive***

On March 11, 2008 the USFWS announced a 12-month finding that the population of North American wolverine occurring in the contiguous United States does not constitute a listable entity under the Endangered Species Act and listing is not warranted (Federal Register/ Vol. 73, No. 48/ Tuesday, March 11, 2008). The Service determined that the contiguous United States population of North American wolverine does not constitute a distinct population segment (DPS) under the Act and therefore a listable entity unto itself. They also found that the contiguous United States population of the North American wolverine is not a significant portion of the range of the North American subspecies and does not warrant further consideration under the Act. This review was initiated as a result of a complaint filed by Defenders of Wildlife and others in September 2006 alleging the Service used the wrong standards the assess the wolverine petition. The U.S. District Court in Missoula, Montana ruled the 90-day petition filed was in error and ordered a 12-month review which was conducted and published in the March 11, 2008 edition of the Federal Register.

**Ecology:** The wolverine is the largest terrestrial member of the mustelid family with males weighing 26 to 40 pounds and females 17 to 26 pounds. Wolverines are opportunistic feeders consuming a variety of foods depending on availability. There is no evidence hunting by wolverines is limited by habitat structure. Primarily a scavenger rather than a hunter, the wolverine forages where carrion can be found (Ruggiero 1994). In addition to carrion they would also prey on small animals and birds and eat fruits, berries, and insects. Copeland et al. (2007) reported little seasonal movement (400 meter elevational band) among collared wolverines in Idaho and the modest shift was likely due to prey availability in the form of ungulate carrion at lower elevation and upslope movement to locate rodents at higher elevations in the summer.

Wolverines occupy a wide variety of habitats from the arctic tundra to coniferous forest. The most common habitats are those that contain a high diversity of microhabitats and high prey populations. Copeland (2007) described wolverine habitat in the contiguous United States as consisting of small, isolated “islands” of high-elevation, alpine habitats containing sufficient depth of snow during the denning period, separated from each other by low valleys of unsuitable habitats. Wolverines occupy habitat in a high elevation band from 6,888 feet to 8,528 feet in the mountains of the lower 48 states (Federal Register/ Vol. 73, No. 48/ Tuesday, March 11, 2008). The intervening valleys in this area range from 3,198 feet to 4,920 feet and are unsuitable for long-term wolverine habitat because they do not have the snow conditions or other habitat features required by wolverines (Aubry et al. 2007 in Federal Register/ Vol. 73, No. 48/ Tuesday, March 11, 2008). High elevation alpine wilderness areas appear to be preferred in summer, which tends to effectively separate most wolverine and human interactions. Aubry et al. (2007) reported that virtually all of the wolverine records located in the Pacific states were within or near alpine areas. Copeland et al. (2007) reported that adult males tend to travel more widely than females and as such, they are more likely found in lower, coniferous-dominated habitats simply by chance. The essential component of wolverine habitat may be isolation and the total absence of disturbance by humans (Ruggiero 1994). However, Copeland et al. (2007) reported that unmaintained winter roads used for snowmobile access to trapping sites in the study area were frequently used for travel by wolverines.

The most critical and limiting habitat for wolverines seems to be acceptable natal denning habitat. Magoun and Copeland (1998) described two types of dens used by wolverines: natal and maternal. Natal dens are used during parturition and occur more commonly in subalpine cirque basins associated with boulder talus slopes. Maternal dens are used subsequent to natal dens and before weaning occurs. They consist of a complex of dens associated with boulders or fallen trees. Magoun and Copeland (1998) believe that a critical feature of wolverine denning habitat is the dependability of deep snow to persist through the denning period of February through May with at least one meter of snow depth. Ruggiero (1994) described natal dens having been found in snow tunnels, hollow trees and even caves in the

ground. Ruggierro (1994) also reported that in forested habitats the structural diversity provided by large snags, fallen logs, and stumps would likely provide natal den sites.

Home ranges for adult wolverines tend to be large ranging from 38.5 square miles to 348 square miles (Banci 1994 in Federal Register Doc. 03-26475). Copeland (1996) radio collared wolverines in Idaho and reported annual home ranges of resident adult females averaged 148 square miles and an average of 588 square miles for resident adult males. Aubry et al. (2007) compiled verifiable and documented records of wolverine occurrences and suggest that the historical distribution of wolverines in the Cascade Mountain and Sierra Nevada was disjunct, contradicting previous interpretations. Current records (1995-2005) are limited to north-central Washington, northern and central Idaho, western Montana, and northwestern Wyoming (Aubry et al. 2007). A recent observation with photographs indicates wolverines are still present in California (Zielinski, pers. comm. 2008). Aubrey et al. (2007) found no current records in Oregon despite concerted efforts to obtain verifiable evidence of wolverine occurrence using remote cameras, bait stations, and helicopter surveys in many areas of the Pacific states. However, five verifiable records of wolverine presence in Oregon were documented from 1961 to 1994 (Aubry et al. 2007).

Wolverine may be impacted by management practices that influence subalpine and alpine communities, particularly those that reduce the presence and opportunity for carrion availability (Copeland et al. 2007). Resource extraction (including timber harvesting), backcountry skiing and snowmobiling, roads and other forms of human disturbance merit careful consideration by those concerned about wolverine conservation (Ruggiero et al. 2007) Researchers in British Columbia found a consistent negative association between wolverine occurrence and areas where helicopter and backcountry skiing occur. However, the causal factors associated with these patterns are not well understood (Copeland et al. 2007). Squires et al. (2007) found that trapping was the primary factor explaining decreased survival in western Montana. He also determined that harvest pressure was capable of reducing isolated populations beyond sustainable levels despite a regulated harvest within a state-wide quota system.

**Existing Conditions:** The Crescent Ranger District performed carnivore surveys from 1993-1996 and 1998 using bait with camera stations, but the only carnivore species detected was the American marten. District records list unconfirmed wolverine sightings near Willamette Pass, Maklaks Mountain, and near Crescent Creek. Potentially suitable natal denning habitat may be found in the Mt. Thielsen and Diamond Peak Wilderness areas, and Cowhorn Mountain within the Oregon Cascades Recreation Area (OCRA). It is unlikely denning habitat would be found in the remainder of the Crescent Ranger District because of open roads, high recreational use, and the lack of persistent snow cover in alpine and subalpine areas where denning may occur. Aubry et al. (2007) reported that virtually all of the wolverine records located in the Pacific states were within or near alpine areas. They also reported that spring snow cover was the only habitat layer in their study that fully accounted for the distribution of historical wolverine records in the western mountains.

In 2000 the Forest Service (Willamette, Deschutes, and Umpqua National Forests) completed an environmental assessment that allowed them to conduct helicopter surveys during the winter over the southern and central Cascade Mountains of Oregon including the Sky Lakes Wilderness, Mt. Thielsen Wilderness, and the Diamond Peak Wilderness. The study was to last five years and beginning in 2001 were authorized a limited number of landings in wilderness areas to investigate possible tracks if sighted. Flight areas have included some of the most southern portions of the Crescent Ranger District. At the conclusion of the study in late 2006, no track observations from any flight have been confirmed to be wolverine (Henshaw, pers. comm. 2005).

The Viable Ecosystem model was used to estimate acreage of potential denning habitat for this species. There are approximately 133 acres of mountain hemlock stands greater than 20 inch diameter that may serve as potential denning habitat. While these acres are all located near the summit of Odell Butte and

Royce Mountain none of the acreage is within or adjacent to alpine areas that Aubry et al. (2007) reported as wolverine locations in the Pacific states. As of November 2009 wolverine presence has not been confirmed on the Crescent Ranger District.

***Environmental Consequences***

**Effects Common to All Alternatives**

The selection of any alternative would have no effect on potential wolverine denning in the project area or Crescent District. The most suitable potential denning habitat is found in the Mt. Thielsen and Diamond Peak Wilderness areas neither of which extends into the project area. High road densities, housing subdivisions, and year-round recreational use including the Willamette Pass Ski Area just outside the project area would likely preclude wolverine use of the Three Trails OHV project area. Although OHV use is expected to increase 2.5 to 5.6 percent annually, all use would be restricted to the designated trail system. Motorized route densities would decrease within the analysis area with all action alternatives compared to the current condition (see Big Game analysis in this section). This would be beneficial to all carnivore species including the wolverine, although at the present time (January 2010) there are no recent documented records of wolverine presence on the Crescent District.

**Determination**

The conclusions listed above lead to a determination of **"No Impact"** to the California wolverine. Because no effects are identified, there are no cumulative effects. It is estimated that in early 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

**Crater Lake Tightcoil Snail (*Pristiloma articum crateris*), R6 Sensitive**

**Ecology:** "The Crater Lake Tightcoil may be found in perennially wet situations in mature conifer forests, among rushes, mosses and other surface vegetation or under rocks and woody debris within 10 meters of open water in wetlands, springs, seeps, and riparian areas, generally in areas which remain under snow for long periods of time during the winter. Riparian habitats in the eastern Oregon Cascades may be limited to the extent of permanent surface moisture, which is often less than 10 meters from open water" (Duncan et al. 2003). Threats to the species include activities that compact soils, reduce litter and/or vegetative cover, or impact potential food sources.

**Existing Conditions**: Due to the well draining pumice soils on the Crescent Ranger District, areas that retain permanent surface moisture are very narrow margins along the edge of springs, seeps, or streams. Within the project area, permanent water sources include the Little Deschutes River, Hemlock Creek, Spruce Creek, Basin Creek, Rabbit Creek, Swamp Creek, Cold Creek, and Crescent Creek. Surveys for the Crater Lake tightcoil snail were conducted in 2001 in the Spruce Creek, Rabbit Creek, Basin Creek, and Hemlock Creek drainages of the project area. There were no Crater Lake tightcoils located, although several more common snails and slugs (Discus and Deroceras) were found to be present in several of these stream systems and/or riparian zones. As of February 2010, there remains only one confirmed population of Crater Lake tightcoil snails on the Crescent Ranger District. That population was located outside the project area near the confluence of Princess Creek and Odell Lake in June 1999.

***Environmental Consequences***

**Direct and Indirect Effects**

**Alternative A**

The selection of Alternative A would result in no change in motorized access to the riparian areas within the analysis area. The surveys conducted in 2001 did not confirm tightcoil presence in the project area

and the annual water fluctuations that occur along the Little Deschutes River during spring runoff may inhibit the establishment of tightcoil populations on this system.

Future use of Maintenance Level 1 roads and user-created roads and trails would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest.

**Effects Common to All Action Alternatives (B, C, D, and E)**
All action alternatives propose the development of a defined OHV trail system and the closure of un-needed user-created trails and roads. None of the roads or trails proposed for closure or new trial construction would impact perennially wet areas that could provide habitat for this species. Likewise, none of the roads or trails included as part of the trail system or the development of staging areas traverse perennially wet areas. While Alternative C proposes the construction of an OHV bridge over the Little Deschutes River, no perennially wet habitat would be impacted by construction activities. Based on the level of surveys previously conducted and that no motorized trails would access areas of permanent surface moisture, implementation of any Three Trails OHV action alternatives would have **"No Impact"** to the Crater Lake tightcoil snail. Because no effects are identified, there are also no cumulative effects.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

**Silver-Bordered Fritillary (*Boloria selene*), R6 Sensitive**
**Ecology:** The silver-bordered fritillary butterfly has a holarctic range extending from northern Canada southward into the United States and as far south as New Mexico (NatureServe 2008). While the species is common and widespread in northeastern Washington and northern Idaho, colonies are extremely local and isolated southward, and are particularly vulnerable to local extinctions. Only two primary colonies are found in Oregon, one at Big Summit Prairie on the Ochoco National Forest and one in the Strawberry Mountains Wilderness on the Malheur National Forest (Miller and Hammond 2007). NatureServe (2008) lists this species as G5, demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery. In Oregon its ranking is listed as S2, Imperiled. Suitable habitat for this species is described as mostly wet meadows, marshes, bogs, and more open parts of shrubbier wetlands (NatureServe 2008; Miller and Hammond 2007). This species is dependent on the maintenance of open and wet meadow habitats (Miller and Hammond 2007). Food sources for the adults include nectar sources such as composite flowers, including goldenrod and black-eyed susans (Opler et al. 2006). Eggs are laid singly near host plants and caterpillar hosts are violets including *Viola glabella* and *Viola nephrophylla* (Opler et al. 2006).

***Environmental Consequences***
**Alternative A - Existing Condition**
Surveys for this fritillary species were conducted in the Big Marsh complex (outside the project area) in the summer of 2008 with no confirmation of species presence. Surveys in other potentially suitable meadow sites have not been conducted at this time. Within the Three Trails OHV analysis area suitable habitat for this species may occur in the wet meadow complexes of Spruce Creek, Hemlock Creek, and Swamp Creek. Riparian habitat is also present in the analysis area on private lands along the Little Deschutes River and Crescent Creek. However, it is currently unknown if suitable habitat conditions exist for this species on private lands.

The selection of this alternative would result in no change in motorized use within the project area including user-created trails and roads within riparian areas of the Little Deschutes River. Because it is

unknown if the species exists on the Crescent District it is also unknown if motorized routes user-created or not have resulted in impacts to the species. Future use of Maintenance Level 1 roads and user-created trails and roads would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes Forest.

**Effects Common to All Action Alternatives (B, C, D, and E)**
There are no proposals to develop new motorized trails or include user-created trails that access wet meadow habitat that may be providing habitat for this species of butterfly. There are also no staging areas or viewpoints planned that access wet meadow habitat. The rehabilitation of user-created trails and roads not needed for the OHV trail system would include the placement of rocks, boulders, logs and subsoiling to restore damaged lands. The use of heavy equipment including small excavators may be needed for this restoration work although it would not impact any plant host species for the butterfly because the work would not extend beyond the road or trail prism. All action alternatives would result in a reduction in user-created trails from the current total of 13.3 miles within the riparian reserves and would decrease to 3.1 miles in Alternative B, 2.2 miles in Alternative C, and 1.1 miles in Alternatives D and E which become part of the designated trail system. Trail closures and rehabilitation to restore these lands with native vegetation would benefit fritillary habitat, if the species is present in the Little Deschutes River riparian zone. While OHV use is projected to increase 2.5 to 5.6 percent a year as the trail system becomes more widely known, use would still be restricted to those roads and trails only that are open for use. Alternative C proposes the construction of an OHV bridge over the Little Deschutes River, however, the bridge span would avoid any wet meadow habitat that may potentially host the adult butterfly or larvae.

**Determination**
Because the species has not been documented to occur on the Crescent District and that no potentially suitable adult and larvae habitat would be affected, the selection of any action would have **"No Impact"** on the Silver-bordered Fritillary butterfly and therefore no cumulative effects would occur. It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

**Johnson's Hairstreak (*Callophrys johnsoni*), R6 Sensitive**
**Ecology:** The Johnson hairstreak butterfly is found from southwest British Columbia southward into the Coast Ranges to San Francisco in California; south in the Cascades and Sierra Nevada to Yosemite and also in the Blue Mountains of eastern Oregon. In Oregon its ranking is listed as S2, Imperiled, while globally its status is G3, very rare or local throughout its range or found locally in a restricted range (NatureServe 2008).

Suitable habitat for this species is described as coniferous forests, especially old growth (Opler et al. 2006) and old growth coniferous forests with red firs, western hemlocks, or gray pines on which its parasitic (mistletoe) hosts grows (NatureServe 2008). Johnson's hairstreak is believed to feed generally on all dwarf mistletoe species throughout its range, and to perhaps specialize on locally available dwarf mistletoes in specific localities (Miller per comm. 2008 cited by Schmitt and Spiegel 2008). Miller and Hammond (2007) describe suitable habitat as almost identical to that of the northern spotted owl except that the butterfly does not occur south of central California. The caterpillar food plant is western dwarf mistletoe. Adults find nectar on low growing plants such as whitethorn ceanothus and Mt. Hood Pussypaws (NatureServe 2008 and USDA NRCS 2008). Miller and Hammond (2007) described management practices to benefit this species need to promote the maintenance of mature and old-growth conifers at middle to low elevations on the west slope of the Cascade Mountains and Coast Range.

Opler et al. (2006) shows Johnson hairstreak documentation for western and central Oregon plus the Blue Mountains in northeastern Oregon. The species is suspected to occur on the Deschutes National Forest but currently there is no confirmed documentation. A survey protocol was released in April 2010 (Davis et al.) and formal surveys using the protocol were conducted on the Deschutes National Forest during the summer of 2010. Larvae were collected from dwarf mistletoe, however, species identification has not occurred yet but are expected in the fall of 2010. Because the species is closely associated with dwarf mistletoe which is present in the project area, the Johnson's hairstreak is assumed to occur. Schmitt and Spiegel (2008) state that claims of dwarf mistletoes occurring solely in old growth or are dependent upon old growth are erroneous. Dwarf mistletoes generally increase in incidence and intensity in older stands, although even young stands readily host dwarf mistletoes and maturing stands may be severely infected if they have been continually infected by a residual overstory. They also state that in the absence of recent large scale disturbance, dwarf mistletoe infestation levels can occur in early, mid, and late successional stands. Incidental observations within the 93,016 acre project indicate dwarf mistletoe is very common and infection is assumed to be present in all stage age classes which could serve as a host for the caterpillar. A map in the survey protocol (Davis et al. 2010) shows the Three Trails OHV project area is mostly listed as having a low to moderate probability of Johnson hairstreak occurrence based on predictive models.

***Environmental Consequences***

**Direct and Indirect Effects**

**Alternative A – Existing Condition**

With the selection of this alternative there would be no change in the current road and trail use in the project area. Vegetative conditions including the presence of mistletoe infected forest would remain the same at least in the short-term. Wildfires and/or a large-scale outbreak of spruce budworm or mountain pine beetles could have the capability to affect thousands of acres of forest in the future which could affect the presence of mistletoe in the project area which this species is closely associated with. Motorized vehicles would also have the capability to drive over and crush adults that may be resting on roads or trails or from contact with vehicle windshields or grills. Road density analysis completed for the Big Game Effects section also in Chapter 3, show an existing combined road and trail density of 4.29 miles per square averaged over 191,971 acres of analysis area. In the absence of species confirmation, potentially tens of thousands of acres of mistletoe infected stands are present in the project area. There is not enough information currently known to determine what level of impact may be occurring to this species from motorized road and trail use on the Crescent District.

Future use of Maintenance Level 1 roads and user-created trails and roads would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest.

**Effects Common to All Action Alternatives**

All action alternatives propose a designated OHV trail system and would close roads and trails not needed for the trail system. User-created trails and roads would be closed by the placement of boulders, rocks, logs, and/or by subsoiling methods and allow restoration of native plant species. Overall combined road and trail densities open for motorized use would drop from 4.29 miles/mi$^2$ in Alternative A down 2.83 miles/mi$^2$ in Alternative B, to 2.55 miles/mi$^2$ in Alternative C, to 2.53 miles/mi$^2$ in Alternative D, and 2.51 miles/mi$^2$ averaged across 161,971 acres of analysis area which includes the entire 93,016 acre project area. The larger acreage number is based on using entire subwatersheds for analysis purposes. Reduced motorized densities would lower the risk of butterfly loss to vehicles traveling open roads and trails as compared to Alternative A. Staging areas are also planned in each action alternative that would allow for parking but may also permit overnight camping, installation of fire rings, toilets, and picnic tables depending on the site and alternative (see Recreation section in Chapter 3 for specifics on staging areas). Limited tree removal may occur during the development of staging areas to create parking areas or the other facilities mentioned above and each area would range from 1-2 to 3-5 acres in size with up to

nine staging areas planned although several are already in place as existing campgrounds. Hazard trees would likely be removed for staging area construction which may or may not be infected with mistletoe and capable of providing habitat for the species.

While OHV use is projected to increase 2.5 to 5.6 percent a year as the trail system becomes more widely known, use would still be restricted to those roads and trails only that are open for use resulting in less impacts to the species because fewer miles of roads and trails are open for travel. Alternative C also proposes the construction of an OHV bridge over the Little Deschutes River however, the bridge span would require few trees to be removed that may or may be infected with mistletoe and minimal impact.

**Determination**

The selection of any action alternative would result in a reduction of motorized access and density within the project area and result in reduced risk of mortality to the species, if documented to be present. Limited new trail construction and tree removal for trail maintenance may cut trees currently infected with dwarf mistletoe. However, mistletoe infection is widespread across the project area in all plant associations and tree size classes and would remain widespread throughout the 93,016 acres Three Trails OHV project area. Based on these assumptions, the determination for all action alternatives is "**May impact individuals or habitat, but would not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species"** for the Johnson's hairstreak.

**Cumulative Effects**

Table 11 of the EIS was reviewed for project actions that have a similar zone of influence and overlap in time and space as the Three Trails OHV project. The zone of influence was determined to be the 93,016 Three Trails OHV project analysis area. Present or foreseeable actions where tree removal is proposed within the overlap include the BLT EIS (2009) with 7,499 acres analyzed for tree removal, Crescent Districts annual danger tree removal along highways and campgrounds (approx. 100 trees per year), Five Buttes EIS (2007 decision and currently in litigation) with 4,235 acres of commercial thinning and 3,931 acres of fuels only treatments planned, not all of which overlaps with Three Trails, Maintenance Burn CE (2005) with prescribed fire on 1,933 acres, Prescribed Underburning and Mowing Project CE (1997) with 2,553 acres of burning and brush mastication, Spruce Creek Restoration CE (2007) with 100 acres of pre-commercial thinning, and the Annual Small Diameter Tree Thinning on approximately 2,000-3,000 acres each year. Foreseeable projects with tree thinning and prescribed fire include the Rim-Paunina Vegetation EIS (2010 NEPA analysis) with approximately 10,000 to 13,000 acres of commercial thinning, non-commercial thinning, and prescribed fire that completely overlaps with Three Trails. All of these projects have the capability to remove mistletoe infected trees through commercial and pre-commercial thinning as well as prescribed fire.

All vegetation management projects include Project Design Features and/or mitigation measures to retain up to 15 percent of the planned acreage left in a passive management scenario which would retain mistletoe infected trees where they occur and may be providing habitat for this butterfly species. Mistletoe occurrence would also remain widespread across the project area. None of the remaining activities in Table 11 were considered relevant for cumulative effects discussion due to spatial proximity, no overlap with the scope of activities, or the effects had diminished to a point that are not quantifiable. It is unknown if suitable habitat conditions exist for this species on private lands in the project area or the 43,235 acre Gilchrist State Forest purchased by the Oregon Department of Forestry in March 2010 from Cascade Timberlands and how these lands could contribute toward conservation of this species. Considering that measures have been employed for the retention of habitat features essential to this species, there is no additive cumulative impact.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this

EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

## Management Indicator Species

During the preparation of the Deschutes National Forest Land and Resource Management Plan (USDA LRMP 1990), a group of wildlife species were identified as Management Indicator Species (MIS). Certain wildlife species have been identified in the Deschutes National Forest Final Environmental Impact Statement Land and Resource Management Plan (EIS) and selected as MIS because their populations are believed to be influenced by forest management activities. They were chosen because they: (1) are designated as Proposed, Endangered, Threatened, or Sensitive on Federal or Oregon state lists, or; (2) have special habitat needs that may be influenced significantly by planned management activities, or; (3) are popular for hunting or trapping, or; (4) are nongame species of special interest, or; (5) indicate the effects of management for other species within major biological communities (EIS 1990. P. 3-14). The MIS species welfare can be used as an indicator of other species dependent upon similar habitat conditions. Indicator species can be used to assess the impacts of management actions on a wide range of other wildlife with similar habitat requirements. The species listed in Table 60 were selected for the Deschutes National Forest.

**Table 60. Deschutes National Forest Management Indicator Species**

| Deschutes National Forest Management Indicator Species | Habitat | Presence Within The Analysis Area |
|---|---|---|
| Woodpecker Guild | | |
| Lewis' Woodpecker | Open woodland habitat near water | Yes |
| Red-napped Sapsucker | Pine/aspen forests with riparian habitat | Yes |
| White-headed Woodpecker | Open ponderosa pine or mixed-conifer forests dominated by ponderosa pine. Densities increase in large diameter or old-growth sites. | Yes |
| Black-backed Woodpecker | Conifer forests including ponderosa pine, lodgepole pine, Douglas - fir/mixed conifer with high proportions of dead trees | Yes |
| Three-toed Woodpecker | Lodgepole pine, mixed-conifer, Douglas -fir/mixed conifer forests at high elevations | Yes |
| Hairy Woodpecker | Mixed-conifer and ponderosa pine forests adjacent to deciduous stands | Yes |
| Downy Woodpecker | Aspen stands with riparian habitat, Less common in mixed conifer and ponderosa pine forests | Yes |
| Williamson's Sapsucker | Mid- to high-elevation mature or old-growth conifer forests with fairly open canopy cover | Yes |
| Northern Flicker | Open forests and forests edges adjacent to open country, Terrestrial habitats | Yes |
| American Marten | Mixed conifer and high elevation hemlock/lodgepole pine late-successional forests | Yes |
| Northern Goshawk | Open forests with a mosaic of large trees, snags and down wood suitable for foraging, nesting and post-fledgling areas. Unforested habitats | Yes |

| Deschutes National Forest Management Indicator Species | Habitat | Presence Within The Analysis Area |
|---|---|---|
| Osprey | Nests near fish baring bodies of water with | Yes |
| Northern Bald Eagle | Lakeside, Reservoirs, Large Trees | Yes |
| Northern Spotted Owl | Late and old-structured Mixed conifer forest | Yes |
| Mule Deer | Mosaic of early, forage-producing stages and later, cover-forming stages of forests, i.e. conifer, ponderosa pine, lodgepole pine and mixed ponderosa/lodgepole pine forest with shrub understory, in close proximity | Yes |
| Elk | Mosaic of early, forage-producing stages and later, cover-forming stages of forests, in close proximity | Yes |
| Great Blue Heron | Estuaries, Streams, Marshes, Lakes | Yes |
| Great Gray Owl | Mature to old growth coniferous and mixed conifer/lodgepole pine forests adjacent to opening in forests, usually meadows | Yes |
| American Peregrine Falcon | Cliffs and Riparian | Not Documented |
| Wolverine | Mixed forests, High elevations | Not Documented |
| Townsend's Big-eared | Roost sites in building, caves and bridges | Not Documented |
| Waterfowl | Lakes, Ponds, Streams, Wet Meadows | Yes |
| Golden Eagle | Elevated nest sites in open country | Yes |
| Red-tail Hawk | Large trees in mixed habitat | Yes |
| Cooper's Hawk | Deciduous and mixed conifer forest, open woodlands and riparian woodlands. Found in large forests, but more likely to occur near forest edges and clearings near lakes and streams | Yes |
| Sharp-shinned Hawk | Deciduous and mixed conifer forest, open woodlands and riparian woodlands. Found in large forests, but more likely to occur near forest edges and clearings near lakes and streams | Yes |

Effects to the northern bald eagle, northern spotted owl, American peregrine falcon, wolverine, and Townsend's big-eared bat are discussed in the Proposed, Endangered, Threatened, and Sensitive Species section, also in this Chapter. Effects to mule deer and elk are disclosed under the Big Game section in this Chapter. Potential effects to the remaining species are discussed here.

Project activities would primarily focus on providing OHV use through trail systems, routes, and/or staging areas within the Three Trails OHV project boundary. As a result, the quality, effectiveness, and distribution of wildlife habitat available to some management indicator species in the planning area may be altered. Disclosure of effects to the remaining MIS species follows this section.

The wildlife sightings discussed in the following sections came from random observations while conducting other forest management activities and from species specific surveys as noted. There can be

considerable overlap of habitat for some species based on the habitat definitions used to model acres of habitat.

**Woodpecker Guild**

Effects to the white-headed and Lewis' woodpeckers have been disclosed in the Threatened, Endangered, and Sensitive section of this Chapter. Effects to the red-napped sapsucker have been disclosed in the Birds of Conservation Concern section also in this Chapter. Effects to the black-backed, three-toed, pileated, hairy and downy woodpeckers and the Williamson's sapsucker and common flicker are discussed here. Direct, indirect, and cumulative effects are discussed at the end of the woodpecker guild section.

**Black-backed and Three-toed Woodpeckers**

**Ecology**

Marshall et al. (2003) described the center of abundance for black-backed woodpeckers in Oregon as the lodgepole pine forest east of the Cascade crest between Bend and Klamath Falls. For the three-toed woodpecker, Marshall et al. (2003), describes the species as rare and local reports come sparingly from both slopes of the Cascades and the Blue Mountains. Habitats for both species include lodgepole pine forests, mixed conifer, and mountain hemlock, although forest type may not be as important as the presence of bark beetles (Marshall et al. 2003).

Goggans et al. (1989) conducted a study on the Deschutes National Forest during a mountain pine beetle epidemic, including a portion of the Crescent Ranger District, on both species showing nesting, roosting, and foraging preferences. Both species nest in stands with bark beetles, disease, and heart rot. The Goggans study concluded that lodgepole pine trees with heart rot were used exclusively for nesting by three-toed woodpeckers with 75 percent of the nests in snags. For black-backed woodpeckers, 89 percent of the nest trees were in lodgepole pine with heart rot with 65 percent of the nests in live trees. In the study, mean nest tree diameter for each species was 11 inches in diameter although in the Blue Mountains of Oregon; average nest tree diameter was 14.6 inches (Bull et al. cited by Wisdom et al. 2000). Goggans et al. (1989) also concluded that the three-toed woodpeckers selected for nest stands at a slightly higher elevation, 4500-5600 feet, as compared to black-backs at 4350-5400 feet elevation. Neither species prefers to roost in logged forests. Both avoided cut areas for foraging. Other differences included three-toed woodpeckers selected nesting stands undisturbed by logging at a higher rate than black-backs (75 to 49 percent of total nests located) and that three-toed woodpeckers selected mountain hemlock stands for roosting while black-backs selected lodgepole pine, mixed conifer with lodgepole pine, or mountain hemlock with lodgepole pine.

Estimated summer home ranges for three individual black-backed woodpeckers in a bark beetle outbreak varied from 178 to 810 acres, with home ranges decreasing in size as the proportion of unlogged and mature acres of forest increased (Goggans et al. 1989). However, the same study of radio telemetry data of three banded three-toed woodpecker males showed estimated summer home ranges varied from 131 to 751 acres. Home range acreage was not related to the amount of unlogged area or the amount of mature and immature forest present.

For the state of Oregon, the Oregon State Heritage Program lists both species ranking as S3, Vulnerable (NatureServe 2009). Possible reasons for this listing may be due to fire suppression, cutting of snags, and loss of mature and old-growth forests, but reliable trend and status information is lacking (NatureServe 2009). This is due to each species' association with forest disturbances and large home ranges making it sensitive to logging and forest fragmentation. Both species show an affinity for burned forests and there is good evidence that bark-beetle killed forests are important habitats in Oregon and the species also occurs sparingly in unburned, mature forests (Marshal et al. 2003). However, stand-replacing fires produce habitats that briefly contain abundant food resources for woodpeckers (McCullough et al. 1998

cited in Marshall et al. 2003). After three to five years, the majority of the insects inhabiting the dead wood emerge as adults and do not re-colonize the dead trees, resulting in a decrease in food availability and hence habitat suitability for woodpeckers. Wisdom et al. (2000) reported results from breeding bird surveys (BBS) indicate black-backed trends from 1966-1995 as stable in North America. Trend data generated by BBS may be inadequate for monitoring due to this species uncommon status and its difficulty to detect. For the three-toed woodpecker, Wisdom et al. (2000) reported from 14 BBS routes, trend data showed an annual 0.7 percent decline between 1966 and 1995.

Wisdom et al. (2000) stated there are several factors affecting these species. Silvicultural practices (tree harvest before susceptibility to beetle attack) and fire management policies (salvage logging) have altered natural patterns of beetle outbreaks. Also, increasing road densities have allowed greater human access into forested regions for snag removal as firewood. Usurpation of black-backed nest cavities by hairy woodpeckers and Lewis' woodpeckers (Goggans et al. and Saab and Dudley 1995 cited by Wisdom et al. 2000) may potentially reduce their reproductive success.

**Existing Condition**

Because of some similarities in selection of nest stands, the Viable Ecosystem model used a similar nesting habitat for each species. All lodgepole pine, ponderosa pine with lodgepole, mixed conifer, and mountain hemlock PAGs with trees between 5-20 inches diameter above 4,500 feet (minimum Crescent District elevation) was used to estimate acres of potentially suitable nesting habitat in the analysis area. This size range was used because the Goggans et al. study (1989) showed nest tree diameters ranged from 7-17 inches. Using this definition, modeling indicated approximately 59,539 acres of nesting habitat or 64 percent of the analysis area. This includes acreage found on private property in the analysis area. The 21,000 acre Davis Fire 2003 (outside the planning area), the 80 acre 2000 Muttonchop Butte fire and the 381 acre 2008 Royce Butte fire, are recent wildfires that are currently providing foraging habitat for the species. Potential nesting habitat is generally distributed across the entire planning area although to a lesser degree east of Highway 97 in the ponderosa pine PAGs without lodgepole pine present.

District observational records show 24 reports of black-backed scattered throughout the project area. Two black-backed nests have been reported, which were located southeast of Swamp Creek and below Forest Service road 5840 in the most southwestern part of the project area. There are only two records of three-toed woodpeckers in the analysis area located just north of Crescent Lake and a 2010 report in the Royce Butte Fire area near Crescent Lake Junction.

**Pileated, Hairy, and Downy woodpeckers and the Williamson's Sapsuckers and Common Flickers**

**Ecology**

The hairy and downy woodpeckers, the common flicker, and the Williamson's sapsucker are described as common inhabitants of Oregon and the pileated woodpecker is an uncommon species in Oregon limited altitudinally by habitat availability (Marshall et al. 2003). This guild of species is dependent upon snags and/or live trees with internal rot for nesting or roosting cavities and as a forage substrate.

However, there are differences in their selection of preferred habitats. The common flicker is generally most abundant in open forests and forest edges. The Williamson's sapsucker prefers mid-to-high elevation mature or old-structured forests with fairly open canopy cover. The downy woodpecker prefers riparian areas with hardwoods. The hairy utilizes mixed-conifer forests and ponderosa pine as well as adjacent deciduous stands, while the pileated occurs primarily in dense mixed conifer forests in late seral stages or in deciduous trees stands in valley bottoms (Marshall et al. 2003). Population trends in Oregon have been reported as stable (Williamson's sapsuckers) or a non-significant decline ranging from 0.4-0.6 percent per year based on Breeding Bird Surveys 1966-2000 as reported by Marshall et al. (2003) for the remaining species. For the state of Oregon, the Oregon State Heritage Program 2009 lists state the hairy, downy, and pileated woodpeckers species ranking as S4, 'Apparently Secure'. NatureServe (2009) listed

the following as the top five major threats afflicting pileated woodpeckers (1) conversion of forest habitats to non-forest habitats, (2) short rotation, even-age forestry, (3) monoculture forestry, (4) forest fragmentation, and (5) removal of logging residue, downed wood, and pine straw that would ultimately put nutrients back into the ecosystem and provide foraging substrate. For hairy woodpeckers possible local declines may result from usurpation of nest cavities by house sparrows or starlings. The Williamson's sapsucker is listed as S4B, 'Apparently Secure' for breeding populations and S3N, 'Vulnerable' for nonbreeding populations (NatureServe 2009). This ranking differs from the 2008 S5 'Secure' listing, there were no reasons given for the declines. Northern flickers are ranked as S5, 'Secure' (NatureServe 2009).

**Existing Condition**

Pileated woodpecker habitat for the Deschutes National Forest is defined as ponderosa pine stands with white fir, white fir, mountain hemlock, and Shasta red fir stands with greater than 15-20 inch in diameter trees and a dense canopy condition. Using the above definition, the Viable Ecosystem modeling estimated 6,820 acres of potential pileated nesting habitat in the project analysis area. For the Williamson's sapsucker, the nesting habitat definition was ponderosa pine and white fir stands where the ponderosa pine present was greater than 15-20 inches in diameter in an open canopy condition (1,120 acres). Individual modeling for the hairy and downy woodpecker and the common flicker was not conducted. Hairy woodpeckers and northern flickers are habitat generalists and occur throughout the Crescent Ranger District. On the district, downy woodpeckers are found in deciduous and mixed deciduous-conifer forests and in riparian habitat, where they are most abundant (Marshall et al. 2003). There has been no specific survey conducted for hairy and downy woodpeckers, the common flicker and the Williamson's sapsucker, although district observational records show six Williamson's sapsucker sightings clustered around the Walker Mountain area and one on the southwest side of Odell Butte. One pileated woodpecker nest on the backside of Odell Butte, and four sightings, two north of Royce Mountain, one east of Odell Butte, and one west of Odell Butte were documented within the project area. In addition, two Williamson's sightings were documented one-half mile from the project boundary, one southeast of Crescent Lake and one northeast of Royce Mountain. While conducting other wildlife inventories, wildlife crews have seen the remaining species within the analysis area (Boucher, pers. comm. 2008; Rosterolla, pers. comm. 2009).

***Environmental Consequence***

For the woodpecker guild and cavity nesters, Hamann et al. (1999) and Gaines et al. (2003) have conducted literature reviews of recreational effects, including OHV use. Their reviews showed that recreational trail-associated disturbances did not present a problem to woodpeckers and cavity nesters as a group. Hamann et al. (1999) also stated that recreational activity is unlikely to be focused around nest sites of their species.

**Direct and Indirect Effects Common to All Alternatives**

The most current reviews of recreational trail-associated literature including OHV use did not present a problem to woodpeckers and cavity nesters as a group. Therefore, designation of a defined OHV trail system and projected annual increases of 2.5-5.6 percent a year is not expected to adversely affect this guild of species. A potential indirect effect is the felling of snags for firewood gathering however the Crescent Ranger District does not permit the felling of snags for firewood collection so this impact is avoided. All action alternatives would have trail maintenance activities conducted each year including the projected felling of five to ten snags annually for trail rider safety and focus on staging areas where the greatest hazard exists.[43]

[43] 2009, personal communication with Scott McNew, COHVOPS specialists, regarding hazard tree felling at the 318 mile East Fort Rock designated OHV trail system. In general, dead trees along the trail system are not felled unless they lean out over the trail.

Because the Three Trails OHV project area is 93,016 acres and there are likely tens of thousands of existing snags present, the impact of removing of five to ten per year for trail maintenance are un-measurable. New trail layout would also avoid placing trails where snags currently exist.
Associated actions to the Three Trails OHV project include the rehabilitation of user-created roads and trail using rocks, boulders, logs, and/or subsoiling to restore these lands. A small excavator may be needed to implement this restoration. These actions would be short-term events with project completion taking from a few hours to a few days to implement for each segment. Rehabilitation is not projected to result in any impact to this group of woodpeckers. Staging areas are also proposed for OHV users including using existing campgrounds or Sno-Parks such as Crescent Creek Campground and Junction Sno-Park. There would also be new staging areas created to provide OHV parking and may include amenities like toilets, picnic tables, and fire rings. Larger staging areas maybe three to five acres in size and the small staging with fewer facilities would range from one to two acres in size. A maximum of five staging areas would be created in Alternative C totaling approximately 20 to 25 acres and Alternatives B, D, and E would each develop three totaling about ten acres. Because the staging areas would require some level of development and provide at least parking areas, snag removal would likely be required to reduce risk of injury to the public. However, the number of snags to be removed is likely very minimal compared to the tens of thousands of snags likely present in the 93,016 acre project area and have no measurable effect on woodpecker nesting habitat. Alternative C also proposes the construction of an OHV bridge over the Little Deschutes River. This activity is unlikely to require the removal of any snags that could be providing nesting habitat for woodpeckers and result in no effect to this guild.

**Cumulative Effects**
Table 11 was reviewed for projects that overlap in time and space as the Three Trails OHV project and could contribute to additive effects. Several recent large-scale vegetation management decisions are in the process of implementation (BLT EIS) and/or on hold pending litigation (Five Buttes EIS) that partially overlap the Three Trails OHV project area. Mitigation measures and Project Design Features in each decision document would restrict snag removal to timber sale landings, temporary road construction, and those deemed a safety hazard to forest workers. A reasonably foreseeable project, the Rim-Paunina Vegetation project proposes 10,000 to 13,000 of vegetation treatments including commercial thinning and application of prescribed fire with a decision tentatively planned for 2011. The same mitigation measures and Project Design Features are in place with this project for the protection of snags. The few snags potentially removed during these sales added to the very minimal numbers projected for OHV trail maintenance and staging areas are not expected to result in any measurable change in snag numbers across the 93,016 acre project area. Therefore, no additive cumulative effects to the woodpecker guild and cavity nesters in general are projected.

Snag densities on private land in the project area is assumed to be low because most landowners want to reduce wildfire potential on their land. Consequently, snag habitat is likely limited and may not be available to woodpeckers for very long and would not contribute to nesting populations. The new Gilchrist State Forest that abuts the project area has a stated objective "to maintain the forestlands as managed/working forests and conserve forestlands that could be lost to parcelization and/or development." [44] Activities would focus on developing an integrated management plan for recreation, sustainable forestry, and wildlife habitat. Forest management activities would match the Eastern Oregon Regional Forest Management Plan which would likely thin overly dense young forests in the first decade.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this

[44] State of Oregon Staff Analysis of the Proposed Acquisition, November, 2009

EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist. The direct and indirect effects discussed would remain valid.

**Conclusion**

Within the state of Oregon, the pileated, hairy and downy woodpeckers and the Williamson's sapsucker and common flicker have an Oregon State Heritage Program listing of S4-S5 'Apparently Secure' to 'Secure', whereas the three-toed and black-backed woodpeckers are listed as S3 'Vulnerable' (NatureServe 2009). However, the Oregon State Heritage Program and researched literature do not list off-highway vehicles as a known threat to these woodpecker species. Hamann et al. (1999) and Gaines et al. (2003) also state recreational trail-associated disturbances are not problematic for woodpeckers and cavity nesters.

With project implementation, there will be no change in habitat except for the annual removal of 5-10 hazardous snags for trail maintenance which is nominal when compared to the tens of thousands of existing snags within the 93,016 project acres. For BLT and Rim-Paunina vegetation projects, Mitigation Measures and Project Design Features in each decision document would restrict snag removal to timber sale landings, temporary road construction, and those deemed a safety hazard to forest workers. No habitat would be removed within the Three Trails OHV project area, besides minimal hazardous snags, and Hamann et al. (1999) and Gaines et al. (2003) studies show woodpeckers are not disturbed by OHV traffic; therefore Three Trails OHV project would not contribute to a change in viability on the Deschutes National Forest for the woodpecker guild.

**American Marten**

**Ecology**

The American marten is associated with mixed conifer and high elevation hemlock/lodgepole pine late-successional forests. Martens used denning and resting sites that they use more than once during the year (Raphael and Jones 1997). Raphael and Jones (1997) describe denning and resting sites as "refugia from predation and protection from thermal stress; denning sites have similar function and also offer such protection to young." Gilbert et al. (1997) found that denning and resting sites were in upland forests-especially upland conifer and hardwood forests. Raphael and Jones (1997), in a study of lodgepole pine and ponderosa pine forests on the Winema National Forest, determined that marten denning sites averaged 30 percent canopy cover. They also concluded that martens tend to select rest sites with greater canopy cover (mean 36 percent) when snow cover is present as compared to snow-free times (mean 27 percent canopy cover). Additionally, they found marten in Oregon, during non snow intervals, denning sites included 35 percent live trees, 32 percent logs and 29 percent slash piles, whereas resting sites were primarily both logs and slash piles (Raphael and Jones 1997). The snags and logs martens use all have intermediate levels of decay, with greatest use in the larger (30 inches in diameter or larger) size classes when available (Raphael and Jones 1997). In snags, martens have been known to use old woodpecker nest holes (Spencer 1987). In the Spencer (1987) study, the martens found in trees were preferred lodgepole pines.

Other preferred habitats include riparian areas, ridge tops, and areas where high concentrations of down logs and snags occur (Ruggiero et al. 1994). Martens eat mostly forest rodent species (e.g. squirrels) or riparian rodent species (e.g. voles). They also use more resting sites during the summer verse winter, due to protection and thermoregulation (Chaplin et al. 1997; Bull and Heater 2000). Complex physical structure, especially near the ground, helps provide foraging/hunting areas and shelter from weather and predators (Buskirk and Powell 1994 as cited in Ruggiero et al. 1994; Bull and Heater 2000). Raphael and Jones (1997) estimated male marten home ranges averaged 4,272 acres and female home ranges averaged 1,392 acres. O'Doherty et al. (1997) noticed in their study that year-round, all the martens maintained a common area within their home range.

Claar et al. (1999), in Joslin and Youmans (1999) conducted a literary review of potential effects on from motorized effects on wildlife in Montana, whereas Zielinski et al. (2007) conducted a research study about snowmobile and OHV effects on martens. From their review, Claar (1999) found no literature of recreation effects on mustelids but did focus on mortality from trapping and habitat alteration. They found studies that suggested wolverine, fisher, and marten were very susceptible to overharvesting from trapping (Powell 1979; 1982; and Weaver 1993 in Joslin and Youmans 1999). In addition, they hypothesized that recreation trails, especially snowmobile trails, were used by trappers and may increase opportunities for trapping resulting in mortalities. They also hypothesized martens need large home ranges and recreational activates may contribute to habitat fragmentation resulting in isolation in populations (Claar et al. 1999). In the Three Trails OHV project area the majority of proposed OHV routes and trails already exist and would not further fragment marten habitat.

The Zielinski et al. (2007) study area was two large sites subdivided into two smaller 50 $km^2$ (12,355 acre) plots. Within each site there was a snowmobile and OHV use plot and a non motorized plot. Their study found no OHV effects on American martens. The motorized plots averaged a rider ever two hours on a trail during the peak OHV season. Similar low rates are expected in the Three Trails OHV project area. Zeilinski et al. (2007) also found marten activity was more nocturnal than diurnal. This means OHV use occurs when the martens are denning or inactive in their sheltered cavities (Zelinski et al. 2007). Burskirk (1984) found martens staying in resting sites for long periods of time or frequently all day. Maters (1980) also found martens and pine marten using rest sites during the day. During Spencer (1987) study, most martens were found in enclosed sites offering protection from predators, weather and thermoregulation during warmer months (Simon 1980 in Spencer 1987; Buskirk and Ruggiero 1994; Raphael and Jones 1997; Bull and Heater 2000). Martens that were resting in enclosed sites were found to be less prone to flee from humans approaching, and those in subterranean sites never fled (Spencer 1987). These results further concluded in the Zielinski et al. (2007) study that the martens did not seem to be affected by OHV use or noise while martens were in shelters.

**Existing Condition**

The Viable Ecosystem model was used to map potential denning habitat in the analysis area. The definition used to define denning habitat was lodgepole pine forests with tree diameters 5-10 inches or greater with dense canopy greater than or equal to 40 percent and white fir, Shasta fir, and mountain hemlock stands with diameters greater than 10-15 inches and a dense canopy equal to or greater than 55 percent. This resulted in an estimated 23,843 acres of potentially suitable denning habitat. However, it is likely the program underestimated acres of denning habitat, because marten would use denning sites with canopy cover levels down to 30 percent (Raphael and Jones 1997), but the Viable Ecosystems model only uses one canopy cover number per Plant Association Group. For lodgepole pine, 40 percent is the break between open or dense stands, for mixed conifer and hemlock the break is 55 percent, and for dry ponderosa pine the break between defining stands as open or dense is considered 25 percent. Denning habitat is scattered across the entire analysis area including private lands. The greatest concentration of denning habitat is within the northern portion of the Three Trails OHV analysis area, on the north side of Odell Butte and Royce Mountain, the east side of Crescent Lake, and the northern boundary. Habitat is also located on the upper portions of Walker Mountain and in the Hemlock/Spruce Creek area.

District observation records list over 40 reports of marten in the analysis area, mostly concentrated south of Highway 58. The Crescent Ranger District conducted carnivore surveys on selected areas from 1993-1996 and again in 1998, using bait stations and Trailmaster® cameras. Numerous photographs of marten were recorded from these surveys. For the state of Oregon, the Oregon Natural Heritage program lists the American marten in Oregon as S3/S4 'Vulnerable to Apparently Secure' (NatureServe 2009). NatureServe (2009) stated that for the American marten in the Pacific Northwest, "habitat conservation measures proposed/implemented for the spotted owl and marbled murrelet, and for riparian zones, generally are sufficient to prevent the extirpation of this species, but ongoing management reassessment,

monitoring, and adaptive management are important" (U.S. Forest Service et al. 1993; see also Thomas et al. 1993). In addition loss/degradation of habitat due to timber harvest remains a threat to martens in some areas (NatureServe 2009).

**Direct and Indirect Effects**
**Alternative A**
The selection of this alternative would result in no change in motorized use of the project area. Vehicle use including OHVs would be expected to continue to access and utilize all roads and user-created trails in the project area. However, based on the literature reviewed, it is likely many of the marten in the area have become habituated with motorized use and are likely spending much of the day hours within rest sites as described by Buskirk (1984), Spencer (1987), Claar et. al. (1999), and Zielinski et al. (2007). The potential indirect effect of the road and trail network in the project area is access during the legal furbearer harvest season. The combination of roads and trails that may be used by trappers using snowmobiles allows increased access into marten habitat and may result in an increased level of harvest as compared to areas with reduced motorized access. However, no site-specific data is available to know what level of marten trapping harvest is occurring in the Three Trails OHV project area.

The future use of Maintenance Level 1 roads and user-created trails and roads would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest. It is possible that motorized road and trail use would be reduced in the project area in the future and may indirectly result in reduced trapping harvest of marten.

**Effects Common to All Action Alternatives (B-E)**
Literature reviews by Claar et al. (1999) and studies by Zielinski et al. (2007) do not seem to show marten are sensitive to motorized disturbance and as a result no disturbance buffer analysis was completed for this species. Zielinski et al. (2007) found marten activity was more nocturnal than diurnal. This means OHV use occurs when the martens are denning or inactive in their sheltered cavities (Zielinski et al. 2007). Consequently, the action alternatives would not likely change how martens are currently are using the project area. Implementation of any action alternative is also not expected to result in increased fragmentation. While some new trail construction would be needed to tie routes together, all action alternative propose closure of existing roads as well as user-created roads and trails not needed for the OHV system. As shown in Table 5, 97 to 209 miles of user-created roads and trails and existing roads would be closed to motorized travel depending on the alternative implemented. Habitat modeling indicated the most consolidated denning habitat is located on Royce Mountain, Odell Butte, and the western edge of the project area boundary and generally away from the densest trail loop concentrations reducing fragmentation. In addition, these same areas would also propose numerous miles of road closures that would benefit marten from reduced access during the trapping season or at least until snow covers the ground and trappers would be able to use snowmobiles. Another potential marten effect is road kill although this is most likely to occur on the high speed highways in the project area. Road kill is not likely an issue on the low speed native surface roads and OHV trails.

The closure and rehabilitation of user-created roads and trails would require a small excavator or bobcat machinery to move rocks, boulders, logs, and equipment to subsoil disturbed areas and restore vegetative conditions. Similar to that described for OHV use, this level of noise and activity would not exceed what may be occurring with OHV use plus this would be a short-term activity last a few hours or several days at most for each trail or road system closed. Alternative C proposes construction of an OHV bridge over the Little Deschutes River. The bridge would cross the river at a perpendicular angle and some user-created trails would be closed that parallel the river. This strategy would benefit marten because less motorized use is available to the river corridor for trapping while roads and trails are snow-free and closed to motorized use.

**Cumulative Effects**

Table 11 was reviewed for potential past, present or foreseeable actions that have potential to intensify effects to the marten. The zone of influence is defined as the 93,016 acre Three Trails OHV project area. Recent projects with decisions include the BLT EIS (2009) that proposed thinning and post-sale work on 811 acres of marten denning habitat that amount to five percent of the marten habitat in the project area, not all of which is within the boundaries of the Three Trails OHV area. BLT implementation would also require the construction of 9.7 miles of temporary road for the entire project that totaled 7,499 acres of activities, all of which would be closed after completion of logging and post-sale work. The BLT analysis also concluded that the effects of a reduction in marten denning habitat would last several decades until canopy cover increased and existing snags fell to provide suitable denning condition again. Outyear habitat modeling conducting for the BLT project concluded, in spite of commercial thinning planned, there would be an increasing amount of marten denning habitat over each decade modeled.

A foreseeable action titled the Rim-Paunina vegetation project overlaps the Three Trails OHV area. Rim-Paunina is currently in the effects analysis stage and a decision is not expected until 2011. At this time analysis for effects of proposed treatments for marten has not been completed. Proposed commercial thinning and prescribed underburning range from 10,000 to 13,000 acres. Proposed mitigation measures and project design features would be similar to those prescribed with the BLT project including: at least 15 percent of the treatment acreage would be left in a passive management strategy and no snag felling would occur except for temporary road construction and placement of landings.

The private land in the Three Trails OHV project area is primarily rural housing subdivisions and the community of Crescent Lake Junction. None of this acreage is likely marten denning habitat because of development and would not become suitable habitat in the future. Adjacent to the project area is the new Gilchrist State Forest that totals approximately 43,235 acres. At the present time it is not likely providing much in the way of marten denning habitat due to intensive timber harvest that has occurred over the last decade. Future marten habitat suitability would depend on forest management prescriptions and stated objectives would "maintain the forestlands as managed/working forests and conserve forestlands that could be lost to parcelization and/or development." [45] Activities would focus on developing an integrated management plan for recreation, sustainable forestry and wildlife habitat. Forest management activities would match the Eastern Oregon Regional Forest Management Plan which would likely thin overly dense young forests in the first decade. This change in objective can only be hypothesized to improve future marten habitat, but because of the early stage of the acquisition, it is not possible to quantify how much and when.

It is projected that OHV use would increase annually 2.5-5.6 as the trail system becomes more widely known and more users visit the area. The increased use would still be restricted to those roads and trails open for motorized use. The effects on marten would not be expected to change from that previously described in that, martens are primarily nocturnal and within resting sites during the day based on published research and increased OHV use should not result in greater effects to the species.

With mitigation measures and project design features in place to provide well distributed denning habitat, these vegetation projects would not be expected to result in aggregated effects in combination with the Three Trails OHV project. No short- or long-term marten population decrease would occur therefore; additive cumulative effects are not anticipated.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this

[45] State of Oregon Staff Analysis of the Proposed Acquisition, November, 2009

EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist. The direct and indirect effects discussed would remain valid.

**Conclusion**

For the state of Oregon, the Oregon Natural Heritage program lists martens as S3/4 'Vulnerable to Apparently Secure,' however OHVs are not listed as a threat. Literature reviews by Claar et al. (1999) and studies by Zielinski et al. (2007) do not seem to show marten are sensitive to motorized disturbance. Other research concluded trails can provide trappers more access to habitat (Powell 1979; 1982; and Weaver 1993 in Joslin and Youmans 1999) and possibly more habitat fragmentation (Claar et al. 1999).

The Three Trails OHV Project proposes the closing and rehabilitation of roads and trails benefiting martens by reducing motorized use availability to river corridors for trapping and habitat fragmentation. Habitat modeling for the BLT EIS would increase the amount of denning habitat overtime through vegetation management activities (BLT EIS 2009). Though the Rim-Paunina project analysis has not been completed, some treatment will occur within marten habitat. Rim-Paunina project mitigation measures of 15-20 percent retention of undisturbed habitat within treated acres as well as untreated lands would maintain marten populations within the project area. Accumulatively, these projects would not decrease populations of American marten within the project area. The Three Trails OHV project would not contribute to the change in viability on the Deschutes National Forest for American martens.

**Diurnal Raptors**

Diurnal raptors refer to those raptors, i.e. birds of prey that are active during the day. Existing condition and potential effects to the northern goshawk, Cooper's hawk, sharp-shinned hawk, red-tailed hawk, and golden eagle are discussed in the following section due to similarities in research findings.

**Northern Goshawk**

**Ecology**

The northern goshawk is the largest member of the accipiter family and is distributed across most of Canada, the northern and western United States, and into Mexico. Reynolds et al. (1978) located goshawk nests in Oregon from 580 meters elevation on the west slopes of the Cascades to 1,860 meters nest site. Reynolds et al. (1992) stated preferred nest stands have a minimum of 40 percent canopy cover and the nest sites within these stands have greater than 60 percent canopy cover. Greenwald et al. (2005) reviewed goshawk nesting data and found that a majority of studies found a selection for stands with greater than 40 percent canopy as suitable goshawk nesting habitat. Vegetation plot data collected from Deschutes National Forest goshawk nest sites showed canopy cover ranging from 49-94 percent (USDA 1993). Foraging areas are typically 4,900-5,900 acres; comprised of a forest mosaic that must support a wide range of suitable prey including ground dwellers or those occurring near the forest floor (Marshall et al. 2003).

Sauer et al. (1996 cited in Wisdom et al. 2000) determined that breeding bird survey data for goshawk was insufficient to determine population trends for any state or physiographic region within the Interior Columbia River Basin because of low detection rates. However, sufficient data was available to indicate a stable trend in numbers between the years 1966-1995 for western North America.

Breeding bird surveys provided insufficient data to determine population trends within any state or physiographic province in the Interior Columbia Basin. The Oregon Natural Heritage Information Center maintains a list of the most current information available on the distribution and abundance of animals native to Oregon. For the state of Oregon, they rank the northern goshawk population in Oregon S3, 'Vulnerable', but national they are demonstrably wide-spread, abundant, and secure, G5.

**Existing Condition**
The Viable Ecosystem model was used to determine an estimated acreage of potentially suitable nesting habitat. The nesting definition used was lodgepole pine, ponderosa pine, white fir, Shasta red fir, and mountain hemlock Plant Association Groups (PAGs), with tree diameters greater than 10-15 inches in diameter, and having a closed canopy (greater than 25-55 percent depending on PAG type). This resulted in an estimated 26,627 acres of potentially suitable nesting habitat. Generally, this habitat is widely distributed across the project area and includes approximately 204 acres on private land.

The district wildlife sighting database has seventeen documented observations of goshawks in the analysis area, but no known nests. Observation points seem to be concentrated west of Bunny Butte in the center of the planning area, east of Crescent Lake, and at the very southern end of the planning area. Goshawk surveys using recorded adult alarm calls and wailing calls have occurred in the Three Trails OHV analysis area since 2001 with the exception of 2002, due to overlap with BLT surveys. Surveys conducted in 2008 confirmed one additional accipiter response from a Cooper's or juvenile goshawk. As of August 2010, no known nests are documented in the project area.

**<u>Sharp-shinned and Cooper's Hawks</u>**
**Ecology**
Sharp-shinned and Cooper's hawks are both ranked S4, 'Apparently Secure' in the state of Oregon (NatureServe 2009). For sharp-shined hawks small declines may be attributed to loss of preferred young dense forest stands in boreal forest, which has increased in boreal forest due to logging, and pesticides (NatureServe 2009). The use of pesticides on farmlands and loss of habitat are the major threats for Cooper's hawks (NatureServe 2010).

Both species are closely associated with deciduous and mixed coniferous forests and riparian woodlands. They can occur in large forests but are also found near forest edges and clearings near lakes or streams. In a study in eastern Oregon, Reynolds (1983) found nesting sharp-shinned hawks to use 25-50 year-old even-aged conifer stands while Cooper's hawks used 30-70 year old even-aged conifer stands with somewhat larger and more widely spaced trees than those stands used by sharp-shins. Reynolds also reported the mean distance between the nearest nesting neighbors was 4.1 km. (2.5 miles) for sharp-shins and 4.7 km (2.8 miles) for Cooper's hawks. Both species are adapted to catch avian prey but each would also capture small mammals, lizards, and various large insects and amphibians (Johnsgard 1990). Home range estimates were 1,590 hectares (3,975 acres) for Cooper's hawks and 460 hectares (1,150 acres) for sharp-shin hawks in Oregon (Reynolds 1983). Reynolds et al. (1983) studied accipiter nest sites in eastern Oregon and determined the mean canopy cover for sharp-shinned nests was 68 percent and 64 percent for Cooper's hawks, although the range extends from 20-95 percent for sharp-shins and from 15-100 percent for Cooper's. Both species select nest placement well up in the tree canopy for nest concealment or shading during warm temperatures (Moore and Henny 1983; Reynolds et al. 1983). Dense vegetation provides screening cover and physical protection from predators and predation may account for the high foliage density in the immediate vicinity of the nests of sharp-shins and Cooper's hawks (Reynolds et al. 1982).

**Existing Condition**
The Viable Ecosystems model was used to estimate acres of suitable nesting habitat for the Cooper's and sharp-shined hawks. Modeling for Cooper's hawk habitat is lodgepole, ponderosa, dry to moist Douglas fir, dry to moist grand fir, white fir, mountain hemlock, silver fir, and dry white bark pine stands that have a dense canopy, trees 10 inches in diameter and higher, and early to late seral stages. Modeling for sharp-shinned hawk habitat is lodgepole, ponderosa, dry to moist Douglas fir, dry to moist grand fir, white fir, dry sub alpine fir, Shasta red fir, mountain hemlock, and dry white bark pine stands that have a dense canopy, trees 10 inches to 20 inches in diameter, and early to mid seral stages. There are approximately 26,627 acres of potential nesting habitat for the sharp-shinned hawk and 20,616 acres for the Cooper's

hawk. These figures account for all past and present timber sales, natural events such as wildfires, and any other habitat altering activity. This acreage is generally well distributed on National Forest system lands across the analysis area. The majority of potential habitat is concentrated around Royce Mountain, Odell Butte, and Walker Rim within the analysis area.

The district wildlife sighting database lists eleven sightings and one nest, discovered in 1998, for Cooper's hawks. The nest is approximately a mile east of Highway 97 by Little Walker, whereas the sightings occur throughout the analysis area. While there are four recorded sharp-shinned sightings including one near Odell Butte, Bunny Butte, and two in the most eastern portion of the analysis area, there are no documented sharp-shinned nests within the analysis area. The sightings came from general observations during other forest management activities as well as during surveys for northern goshawks. There is considerable overlap of habitat for each species and habitat. Formal surveys have not been conducted for either species and reported observations are the results of random observations and responses from conducting northern goshawk surveys.

**Red-tail Hawk**

**Ecology**

Red-tail hawks are widely distributed across North America and winter from southern Canada south into the United States and Central America. The red-tail hawk has increased in numbers and expanded its range since Euro-American settlement (Marshall et al. 2003). While it was selected as a Management Indicator Species for large trees in mixed habitat, it uses any habitat that has perches to hunt from and open enough to capture its prey on the ground. Small mammals, such as rabbits, hares, and mice provide the bulk of their diet. They are also known to capture birds, reptiles, and amphibians. Red-tailed hawks use a wide variety of structures for nests, including trees, utility poles, and cliffs (Marshall et al. 2003). They place their nests higher in trees than other raptors, and generally select larger trees or smaller deformed trees where branch structure supports this higher placement. Red-tailed hawks are ranked S5, Secure for the state of Oregon (NatureServe 2009).

**Existing Condition**

No Viable Ecosystem analysis was done for the red-tailed hawk because the species is a habitat generalist as long as trees are present and capable of supporting a nest structure. Red-tail habitat consists of large snag or deformed trees, open country intersperse forests, and suitable perches, e.g. trees, utility poles, outcrops etc. They are known to use agriculture land, clearcuts, grasslands, woodlands, and alpine environments (Marshall et al. 2003). District wildlife sighting records list twenty-nine red-tail hawk observations and 11 nests scattered across the analysis area. Private forestlands in the analysis area are not managed for red-tail hawks, although scattered large, overstory ponderosa pine may provide nest sites. However, any nesting capability for red-tail hawks on private forested lands would be incidental and would not be expected to persist for the long-term.

**Golden Eagle**

**Ecology**

Gilligan et al. (1994) describes the golden eagle as an uncommon to fairly common summer resident in open country east of the Cascade Mountains and a very uncommon summer resident high in the Cascades. The golden eagle nests in open large (greater than 30 inches in diameter) live ponderosa pine or cliff ledges that support its 3-10 foot tall nest (Marshall et al. 2003).

**Existing Condition**

Because the majority of the analysis area is dominated by forested stands with two or three canopy layers of live trees, open country suitable for nesting and foraging is very limited for this species. The Viable Ecosystem analysis was completed that showed approximately 287 acres are present in the Three Trails OHV analysis area with trees greater than 30 inches in diameter that would be suitable for the golden

eagle. Wildlife observation records list eleven golden eagle sightings across the entire district, four within the analysis area. Of these four, two were dead eagles along Highway 58, the other two were live sightings along Highway 97, one in a perch tree and one feeding on a deer carcass. It is unknown if there is enough open habitat present in the analysis area for a golden eagle territory based on Viable Ecosystem modeling. For the state of Oregon, the Oregon State Heritage Program rank golden eagles as S4, 'Apparently Secure' (NatureServe 2009). NatureServe (2009) listed the following as the major threats golden eagles experience: (1) powerline electrocution because wings can span phase-to-phase or phase-to-ground wires (Biosystems Analysis 1989), (2) poison intended for coyotes, (3) occasional shootings, and (4) habitat loss to agriculture and suburban land uses.

***Environmental Consequences***

There is conflicting science when assessing the human disturbance effects on raptors. Gunnison National Forest Travel Management Plan, USDA (2001) and Hamann et al. (1999) suggested in both their literature reviews that sensitivity occurs near nest sites and mainly effects eggs or young. Direct activities, such as noise from vehicles, could disturb these species during nesting and foraging and may negatively affect them. These species may be sensitive to prolonged OHV use adjacent to their nest (USDA 2001 and Hamann et al. 1999). USDA (2001) and Hamann et al. (1999) also found prolonged disturbance during nesting season may result in nest and young abandonment and increased stress levels. Both findings suggest possible recreational disturbances affect raptors by causing parents to desert young or eggs, unprotected egg or nestling exposure to weather, avian nest predation, nestling may leave the nest prematurely (USDA 2001 and Hamann et al. 1999), and on cliffs and accidental recreation caused destruction of nests, e.g. pushing nests off cliffs (Hamann et al. 1999). Also, cross-country travel could lead to disturbance that disrupts pair-bonding, causing exposure of eggs or young to inclement weather and increases adult energy expenditures (Hamann et al. 1999).

Alternatively, studies have found that walking straight to a birds' nest (including raptors) is more disruptive than vehicle or OHV use (Lee 1981; Skagen 1980; Holmes et al. 1993; Burger and Gochfeld 1998 pages 151, 220, 222 and 223; Gill et al. 1996). Specifically, in a northern goshawk and Cooper's hawk study conducted by Lee (1981), female goshawk did not show signs of agitation or flushing from snowmobiles until the riders stopped and got off their machines. In another observation, Lee (1981) found that female hawks did not flush from nests when motorcycles passed by. These and other occasions are examples why Lee (1981) concluded hawks may become habituated to moving machines. In addition, Lee (1981) also stated hawks may tolerate "disturbances", hikers, snowmobiles, motorcycles, and horseback riders, so they can keep territories that meet resource needs.

Flecher at al. (1999) conducted a raptor study in Colorado riparian corridors, which included some with recreation trails. They found red-tailed hawk abundance was similar from the controlled sites to the trail sites. They concluded red-tailed hawks seem to tolerate human activity along the recreational trails. Janes (1984) in a red-tail study in Wasco County, Oregon reported that normal human activity did not affect red-tailed hawk reproductive success. He also concluded that the presence of dwellings or frequently travelled roads and the locations of nests near roads had no significant effects and that compensation for normal human activities was not necessary for estimates of reproductive success. Additionally, raptors have been known to use small two-track roads and trails that experience low use and have existing canopy cover on the sides as foraging habitat (Flecher at al. 1999; St. Pierre 2008). Some avian scavengers prefer to use these types of open areas because vegetation may hide potential predators while they are feeding (Skagen et al. 1991).

**Diurnal Raptor Nesting Seasons**

The Deschutes National Forest Plan provides Standards and Guidelines specifying the following periods for limiting disturbance to nesting golden eagle, osprey and red-tailed hawk (DLRMP, WL-3) as shown in

Table 61. The nesting periods for the remaining species are the commonly accepted dates used by the Deschutes National Forest.

**Table 61. Nesting Periods for Raptors**

| Species | Nesting Period |
|---|---|
| Cooper's Hawk | April 1-August 31 |
| Golden Eagle | February 1-July 31 |
| Northern Goshawk | March 1-August 31 |
| Osprey | April 1- August 31 |
| Red-Tailed Hawk | March 1- August 31 |
| Sharp-shinned Hawk | April 1-August 31 |

### Direct and Indirect Effects Common to All Alternatives

Existing and potential disturbance from vehicle use on roads and motorized trails and the associated fragmentation (edge effect) was modeled. The assumption was disturbance would continue within the road effect zone (200 meters each side of roads or motorized trails) for the OHV travel system described in each alternative. Decreased habitat quality, reduced reproductive potential, and avoidance of the road effect zone are potential effects as a result of habitat alteration physically or due to disturbance. Disturbance would decrease beyond the road or motorized trail effect zone for each alternative and as a result, habitat quality and amount would increase as shown in Table 62.

Table 62 illustrates the amount of potential disturbed and undisturbed habitat for the northern goshawk, Cooper's hawk, sharp-shined hawk, and the golden eagle. The increase in undisturbed acreage and reduction in disturbed acres is directly related to the change in roads and trails open for motorized use.

**Table 62. Comparison of Alternatives for Disturbed (Dist) and Undisturbed (Undist) Cooper's and Sharp-shinned Hawks Habitat Acres within the Three Trails OHV Analysis Area***

| | Alt A | | Alt B | | Alt C | | Alt D | | Alt E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist |
| Northern Goshawk | 21354 (80%) | 5273 (20%) | 13540 (51%) | 13087 (49%) | 14301 (54%) | 12326 (46%) | 13359 (50%) | 13268 (50%) | 13657 (51%) | 12970 (49%) |
| Cooper's Hawk | 16195 (79%) | 4421 (21%) | 10339 (50%) | 10277 (50%) | 10652 (52%) | 9964 (48%) | 9904 (48%) | 10712 (52%) | 10199 (49%) | 10417 (51%) |
| Sharp-shinned Hawk | 21354 (80%) | 5273 (20%) | 13540 (51%) | 13087 (49%) | 14301 (54%) | 12326 (46%) | 13359 (50%) | 13268 (50%) | 13657 (51%) | 12970 (49%) |
| Golden Eagle | 275 (96%) | 12 (4%) | 212 (74%) | 76 (26%) | 212 (74%) | 75 (26%) | 186 (65%) | 101 (35%) | 186 (65%) | 101 (35%) |

* The road effect zone is 200 meters (660 feet) each side of the road or motorized trails

### Alternative A

The current level of disturbance to raptors, whether they are habituated or not would continue until the Travel Management Rule is implemented. Use of Maintenance Level 1 roads and user-created trails would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest. At that time, motorized travel would be limited to designated motorized routes minimizing effects to nesting raptors. Table 62 shows the high level of potentially disturbed nesting habitat present within 660 feet of each side of a motorized road or trail in the project area. However, several studies have suggested that walking straight to a bird nest (including raptors) is more disruptive than vehicle or OHV use (Lee 1981; Skagen 1980; Holmes et al. 1993; Burger and Gochfeld 1998 pages 151, 220, 222 and 223; Gill et al. 1996). The majority of the existing road network in the project area has been in place for several decades and some level of habituation to motorized traffic has

probably occurred for nesting red-tailed hawks since eleven nests are documented in the project area in spite of high open road densities. Janes (1984) in a red-tail study in Wasco County, Oregon reported that normal human activity did not affect red-tailed hawk reproductive success. He also concluded that the presence of dwellings or frequently travelled roads and the locations of nests near roads had no significant effects and that compensation for normal human activities was not necessary for estimates of reproductive success.

For the northern goshawk, Cooper's hawk, sharp-shinned hawk and golden eagle, the selection of this alternative is not likely to have short- or long-term impacts to these species. At the present time nest site data is limited to one 12 year old Cooper's hawk nest location though all four species have been documented to occur in the project area. It is unknown if the high level of roads and trails in the project area has contributed to the lack of discovered nests for these four species. People off roads and trails are likely very limited in most of the project area during the majority of the nesting period for these species. The exceptions would be vegetation management actions that may be under contract such as timber sales and pre-commercial thinning contracts and where seasonal restrictions apply near active nests. While people on foot increases substantially during the big game archery and matsutake mushroom seasons, these activities start after the completion of raptor nesting season. The selection of this alternative would likely to have little effect on the red-tailed hawk and Cooper's hawk known nest sites in the project area.

**Alternatives B-E**
**There is no new trail construction proposed for OHV use that would enter within ¼ mile any of the known red-tailed hawk nest sites or Cooper's hawk nest site in the project area.**

Table 60 displays the amount of disturbed versus undisturbed nesting habitat present in the project area for goshawks, Cooper's hawk, sharp-shinned hawks, red-tailed hawks and golden eagles. Alternative A displays the current condition and assumes all roads and user-created trails are receiving motorized use and concludes that the majority of the nesting habitat for this guild of species is within 660 feet of a motorized route. For each of the action alternatives the amount of undisturbed habitat increases due to the closing of roads and defining which roads and trails would become part of the trail system and Maintenance Level 2 roads available for motorized use. Consequently, all action alternatives result in an improving trend in the amount of undisturbed nesting habitat present in the project area. No nests have been located in the project area for northern goshawks, sharp-shinned hawks, and golden eagles. All action alternatives show that greater than 46 percent of the nesting habitat for the goshawk, Cooper's and sharp-shinned hawk each of the three species would be greater than 660 feet away from a motorized route which would reduce the possibility of potential nesting disturbance due to motorized traffic. For the golden eagle, undisturbed nesting habitat increases to 26 to 35 percent for the action alternatives although it is currently unknown if there is sufficient suitable habitat in the project area to support a nesting pair of golden eagles.

Associated actions to the OHV trail system includes the closure/rehabilitation of user-created roads and trails using rocks, boulders, logs and/or subsoiling with a small excavator or bobcat machinery. This is a short-term disturbance impact that would only last a few hours up to several days but result in additional undisturbed habitat for these raptor species. Also proposed are staging areas for OHV parking and may also include toilets, picnic tables, fire rings, learner loops for OHV beginners, and overnight camping at some staging areas. The most developed sites would include all the above and more primitive sites would have fewer amenities. Table 29 displays the staging areas by alternatives. The most developed staging areas would average three to five acres in size and most primitive at one to two acres. Because concentrated human and OHV use would occur at the staging areas, these lands would not likely provide nesting habitat for any of the species in this group. However, the combined staging areas only represent a total of about 20-25 acres so the impacts across the 93,016 acre project are very minimal and likely have little measurable impact to the species. Also proposed in Alternative C is the construction of an OHV

bridge over the Little Deschutes River that would connect to OHV trails. This action is not projected to create additional impacts because of the numerous existing roads and trails currently in place along the river corridor. While some user-created trails would be closed, motorized access would still be permitted along portions of the river corridor for other recreational activities such as dispersed camping, hunting, mushrooming, trout fishing, and birdwatching.

It is projected that OHV use would increase annually 2.5-5.6 as the trail system becomes more widely known and more users visit the area. The increased use would still be restricted to those roads and trails open for motorized use. The effects on raptors would not be expected to change from that previously described because there would be no increase in the amount of disturbed habitat as OHV would still be restricted to the same roads and trails open for use.

The majority of the existing road network in the project area has been in place for several decades and some level of habituation to motorized traffic has probably occurred for nesting red-tailed hawks. Janes (1984) in a red-tail study in Wasco County, Oregon reported that normal human activity did not affect red-tailed hawk reproductive success. He also concluded that the presence of dwellings or frequently travelled roads and the locations of nests near roads had no significant effects and that compensation for normal human activities was not necessary for estimates of reproductive success.

While some studies have shown that human activity near a nest site, e.g. walking around or stopping vehicles, has more of an effect than OHVs riding by a nest (Lee 1981; Skagen 1980; Holmes et al. 1993; Burger and Gochfeld 1998 pages 151, 220, 222 and 223; Gill et al. 1996) all action alternatives would result in less motorized access into nesting habitat for this group of species. This also means less direct human intrusion into nesting habitat. The end result would be more undisturbed habitat for each species with likely higher nesting success rates although NatureServe (2010) does not there is a major cause for concern at this time.

**Cumulative Effects Diurnal Raptors**

Projects in Table 11 were reviewed for past, present, and foreseeable actions and their potential for additive effects in time and space. All past activities up to 2003 were included in the existing condition discussion and modeling using the FACTS database. Activities that have occurred or projected to occur with potential for effects were determined to be the BLT EIS Vegetation project and the Five Buttes EIS Vegetation project (currently in litigation). Both projects were designed to return many forested stands back to sustainable conditions that can withstand appropriate levels of natural disturbance. These projects would mostly reduce the density of understory trees and apply prescribed fire where appropriate, maintaining large trees on the landscape.

Implementation of the BLT project has begun with two timber sales already sold and harvest underway. Both projects would result in a reduction in the amount of dense structured forested stands the goshawk, Cooper's hawk, and sharp-shinned hawk used for nesting. However, mitigation measures propose a minimum of 15 percent of each treatment unit would remain unharvested (passive management strategy) which could provide suitable nesting stands for these species in addition to untreated forest not analyzed in either EIS. Consequently, there would be no reduction in the numbers of goshawk, Cooper's or sharp-shinned home ranges that can be supported across the analysis area. In addition, there would be no loss of late and old structured habitat, because the largest trees would be retained in each treatment unit. The silvicultural and underburning prescribed in each project would make stands more valuable for goshawk ecology by (1) by alleviating obstructed flight corridors used by goshawks to obtain forest-associated prey; (2) by releasing tree growth needed to produce large diameter trees for nest sites; and (3) by improving vigor in the herbaceous understory that supports potential prey species (Reynolds et al. 1992 cited in Wisdom 2000). These activities were consistent with Wisdom et al. (2000) who listed several issues, strategies, and management practices pertaining to northern goshawks in the Interior Columbia

Basin assessment. It is also noted that Greenwald et al. (2005) in a review of goshawk telemetry studies concluded most but not all studies indicated goshawks use foraging habitat that is similar to nesting habitat. This would indicate that thinned stands being used as foraging habitat is inconclusive at this time.

A foreseeable vegetation project is called Rim-Paunina EIS which proposes to conduct 10,000 to 13,000 acres of treatment in subwatersheds that completely overlap with the Three Trail OHV project area. A decision for the EIS is expected in 2011. Silvicultural and vegetation treatments would be similar to that described above for BLT and Five Buttes. The analysis of acres of nesting habitat treated for these species has not been completed at this time.

While OHV use is projected to increase 2.5-5.6 percent each year, all use would occur only on those roads and trails designated for motorized use still resulting in an increase in undisturbed nesting habitat for each species. In addition, trail maintenance would remove five to ten snags each year from the trail system to provide a safe riding experience for the users. These snags are typically those that are leaning on or into the trail. The removal of this few snags when measured across a 93,016 acre project area is un-measureable and would have no effect to this group of species.

Mitigation measures planned in BLT and proposed for Rim-Paunina includes protection of active nest sites by application of a seasonal restriction for timber harvest and post-sale activities which would not result in any additive effects. This would be consistent with direction provided in DLRMP WL-2 and WL-28.

The Three Trails OHV project is not expected to result in any additive effects to northern goshawks, sharp-shinned hawks, and golden eagles because there are no known nests in the project area and restrictions are in place for active nests if discovered. With mitigation measures and Project Design Features in place to provide well distributed nesting habitat, these vegetation projects would not be expected to result in aggregated effects in combination with the Three Trails OHV project. No short- or long-term northern goshawk, Cooper's hawk, sharp-shinned hawk, or golden eagle population decrease would occur; therefore, additive cumulative effects are not anticipated.

The new 43,235 acre Gilchrist State Forest adjacent to the project area would be managed with wildlife as a component of the management plan being developed. Although management details are unknown, it is assumed the overall management of the forest would increase habitat for most raptors by developing a more diverse forest structure and developing practices that put more emphasis on protecting nests on a broader spectrum other than those protected under the Endangered Species Act which over time, may provide additional species habitat for the diurnal guild of raptor species.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist. The direct and indirect effects discussed would remain valid.

**Conclusion**

The Diurnal raptor group consists of golden eagles, sharp-shinned, Cooper's and red-tailed hawks, and northern goshawks. In the state of Oregon, red-tailed hawks are listed as S5 'Secure' through the Oregon Natural Heritage program, while sharp-shinned hawk, Cooper's hawks, and golden eagles are ranked as S4 'Apparently Secure' while the northern goshawk is listed as S3 'Vulnerable'. There is conflicting science on the effects of OHV use and raptors. Hamann et al. (1999) and Gunnison National Forest Travel Management Plan, USDA (2001) found raptors may be sensitive to prolonged OHV use adjacent to their nest, which can result in nest and young abandonment as well as increased stress levels.

Alternatively, studies have found that walking straight to a birds' nest (including raptors) is more disruptive than vehicle or OHV use (Lee 1981; Skagen 1980; Holmes et al. 1993; Burger and Gochfeld 1998, pages 151, 220, 222 and 223; Gill et al. 1996). Specifically, Flecher at al. (1999) found that red-tailed hawks seem to tolerate human activity along the recreational trails. Janes (1984) in a red-tailed hawk study in Wasco County, Oregon concluded that the presence of dwellings or frequently travelled roads and the locations of nests near roads had no significant effects and that compensation for normal human activities was not necessary for estimates of reproductive success. Therefore the buffer analysis was not done on the red-tailed hawk, but was for the other species within the diurnal raptor group.

The Three Trails OHV Project proposes to create a designated OHV route system. In doing this, the project would reduce road densities and user-created trails throughout the project area by closing roads and rehabilitating user-created trails that would not be part of the trail system. The net result is a reduction in the amount of motorized routes currently used on the Crescent Ranger District. The Three Trails OHV project doubles the amount of undisturbed nesting habitat for those species modeled (Table 62). Project design and the fact that there would be no, or nominal, vegetation removal would increase the amount of undisturbed nesting habitat. BLT and Rim-Paunina vegetation project mitigation measure protects and maintains raptor nesting habitat in the following ways: (1) seasonal restriction within a ¼ mile of a known nest site, (2) 15-20 percent retention of untreated habitat within treated acres as well as untreated suitable nesting habitat within the project area, and (3) treating stands to be resilient to disturbance, such as wildfires, insect, and disease.

Additively, the Three Trails OHV and BLT EIS projects show no short- or long-term northern goshawk, Cooper's hawk, sharp-shinned hawk, red-tailed hawk, or golden eagle population change. For Rim-Paunina, analysis has not been completed, but there would be similar project design and mitigation measure for this diurnal raptor group. Three Trails OHV habitat modeling showed the action alternatives reduce road density, which would reduce potential disturbance to nesting habitat and is likely to increase nest success. Overall, the Three Trails OHV project would result in a positive contribution to the viability of this diurnal raptor group to the Deschutes National Forest.

**Osprey**

**Ecology**

Ospreys are good biological indicators of ecosystem health, because they are long-lived and are the top predator of aquatic food webs (USGS 2005). Various fish species comprise 99 percent of their diet. Ospreys dramatically declined in abundance through the mid-1970s, as a side effect of pesticide use, but have since recovered and become a common nesting species along the Columbia and Willamette waterways in western Oregon (USGS 2005). They nest within two miles of fish bearing bodies of water and generally nest in larger broken top live trees or snags, but also utilize utility poles, man-made Canada goose nest boxes, channel markers, and other manmade structures where natural structures are lacking (Marshall et al. 2003). The primary habitat requirements of osprey include a dependable source of fish that can be captured near the surface and an elevated nesting platform within a few kilometers of their food supply. Ospreys are migratory, typically arriving on the Crescent Ranger District in April and May and stay into early autumn until fall migration. While the pair would mate for life, they migrate separately and re-unite at their nest site the following spring. The birds winter in central California south into Central and South America. For the state of Oregon, the Oregon State Heritage Program rank them as S4 in Oregon, 'Apparently Secure' (NatureServe 2009). NatureServe (2010) listed the following as major threats to ospreys: (1) pesticides, (2) gunshots, (3) steel traps, (4) impact with or electrocution by high-tension wires, and (5) being caught or drowned in nets (Wiemeyer et al. 1980, cited in Henny and Anthony 1989).

**Existing Condition**
There are at least 40 known osprey nests on the Crescent Ranger District, although none are located in the Three Trails OHV analysis area. There was one nest reported in 1994 on top of Royce Mountain (in analysis area), though the nest no longer exists. The greatest concentration of nests are found west and north of Davis Lake, but there are also several nests along the shoreline of Odell Lake, all of which are outside the Three Trails OHV planning area. Intensive bald eagle and northern spotted owl surveys around Crescent Lake did not detect incidental observation of osprey.

Nesting ospreys occupying territories that include high recreational use areas, such as near the Crescent Lake Resort, the Crescent Lake Junction Sno-Park, and user-created OHV and snowmobile trails around the lake. Within the two mile range from a fish bearing body of water, discussed in Marshall et al. (2003), there currently are 5.8 miles of existing OHV trail, snowmobile trails, and approximately 22 miles of shared use roads around Crescent Lake Junction Sno-Park. It is assumed that where there is high recreational use in osprey territories, nests have either been abandoned or if in use, ospreys have become tolerant or habituated to the activity.

The lack of nest data in the project area is likely indicative of most of the land base being greater than two miles away from an adequate food base to support a nesting pair and young in the analysis area. However, the northern portion of the project area may have the highest probability of osprey occurrence due to being within two miles of Crescent and Odell Lake, both fish bearing bodies of water (Marshall et al. 2003).

Ospreys nest around lakes with high human activity, e.g. fishing, boating, OHV use, snowmobile use, camping, hiking, biking, and bird viewing, but still can be sensitive to the recreational disturbances, especially in remote areas (Hamann 1999; Poole 1981). During recreation seasons, ospreys have been known to keep territories with low level of human activity (Levenson and Koplin 1984). The more remote the nest location the higher probability of an osprey is to flush (Reese 1991). Ospreys often flush when disturbed on the nest causing increase risk during hatching and raising young. The adult osprey expels needed energy in flight and leaving the egg or nestling prone to weather and predation (Reese 1991). User-created routes can decrease habitat by providing increased access to snags and other deadwood for firewood harvest (USDA 2001), which may affect osprey habitat. This potential impact is unlikely to occur on the Crescent District because snag felling for firewood gathering is prohibited.

**Effects and Conclusion**
The designation of an OHV trail system and associated actions including user-created road and trail rehabilitation, development of staging areas, an OHV bridge constructed over the Little Deschutes River (Alternative C only), and a projected increase in OHV of 2.5-5.6 percent annually is not expected to negatively effect ospreys because they are not known to nest in the project area and their foraging habitat (Crescent and Odell Lakes) are outside the project area. Within the project area there are 5.8 miles of existing OHV trail, snowmobile trails, and approximately 22 miles of shared use roads around Crescent Lake Junction Sno-Park. Intensive bald eagle and northern spotted owl surveys around Crescent Lake did not detect incidental observation of osprey. Three Trails OHV project mitigation measures are in place to protect any known raptor nest sites, including ospreys. Since the osprey is listed as S4, 'Apparently Secure', statewide in Oregon, and no effects are identified, there are also no cumulative effects with project implementation of any alternative. The Three Trails OHV project would not contribute to a change in viability on the Deschutes National Forest for osprey.

**<u>Great Blue Heron</u>**
**Ecology**
The great blue heron is one of the most wide-spread waterbirds in Oregon (Marshall et al. 2003).

For the state of Oregon, the Oregon State Heritage Program rates the great blue heron as S4, 'Apparently Secure' (NatureServe 2009). It is highly adaptable and found along estuaries, streams, marshes and lakes throughout the state. Nest locations are in the proximity of available food. They nest in colonies called rookeries, in shrubs, trees, and river channel markers where there is little disturbance (Marshall et al. 2003). Tree species they would utilize include mountain hemlock, ponderosa pine, and Douglas-fir. While the average preferred diameter of nest trees is 4.5 feet, they use a wide range of sizes from 1.5 to 6 feet in diameter (Marshall 2003). They hunt shallow waters of lakes and streams, wet or dry meadows feeding on fish, amphibians, aquatic invertebrates, reptiles, mammals and birds.

**Existing Conditions**

Habitat for the great blue heron on the Crescent Ranger District includes meadows, streams, lakes, and wetlands. Colony nesting trees on the Crescent Ranger District include western hemlock, ponderosa pine, and Douglas fir. Within the Three Trails OHV project area, district sightings show a 1994 observation of great blue herons along Cold Creek located in the extreme northwest portion of the planning area on National Forest system lands. Foraging may also take place along the Little Deschutes River corridor, Crescent Creek, and potentially within the Swamp Creek, Hemlock Creek, and Spruce Creek wet meadow complexes. There are no known heron rookeries in the project area and only one documented rookery on the Crescent District located in the Moore Creek drainage west of Davis Lake and outside the project area. This site however, has not been active since 2003 when nesting red-tailed hawks moved into the rookery.

There have been instances of great blue heron rookeries not being disturbed by motor vehicles or human activity. In a publication by The Montana Chapter of the Wildlife Society a heron rookery located next to a service road with truck traffic was active for more than 20 years (Hamann et al. 1999). Conversely, in the same publication they stated great blue herons have been known to flush from nests due to human activity (Hamann et al. 1999). These finding suggest there might be factors when a great blue heron may flush. For example, the flushing of some nesting colony birds depends on: (1) sensitivity of each nesting species to disturbance; (2) timing of disturbance with respect to the breeding season; and (3) the degree to which birds have acclimated to human activity (Tremblay and Ellison 1979; Erwin 1989).

When great blue heron flush due to human disturbance, the adults may abandon the nest and young, or move to an alternative nest (Hamann 1999). When the adults flush from the nest, they leave the eggs or nestlings exposed to adverse weather, which include heat and cold stress, and nest predation (Vos et al. 1985). Other human disturbances include creating trail near nests, which predators may use or tread on nests (Hamann 1999). However, Rodgers and Smith (1995) found great blue herons reacted to humans on foot more than vehicular traffic. Bennette and Zurlke (1999) found in their study that herons exhibited habituation to human recreation, including walking and motorized activity.

***Environmental Consequences***

**Effects Common to All Alternatives**

Because there are no known nest sites (rookeries) within the project area, nesting disturbance would not be an issue with the selection of any alternative including the No Action alternative. Since great blue herons forage in riparian, meadow and mesic shrub areas and there are no known rookeries, the disturbance model was used for foraging habitat. Table 63 displays the amount of disturbed habitat within 660 feet of each side of a road or trail open for motorized use. and would be applicable if /when a heron rookery is discovered in the project area and is located within the disturbed zone. By closing/rehabilitating roads and trails, there will be an increase in undisturbed foraging habitat, as with all action alternatives. This, in turn, has the potential to increase the likelihood of an established rookery.

**Table 63. Comparison of Alternatives for Disturbed (Dist) and Undisturbed (Undist) Great Blue Heron Riparian Habitat Acres within the Three Trails OHV Analysis Area**

| | Alt A | | Alt B | | Alt C | | Alt D | | Alt E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist |
| Riparian | 186 (56%) | 144 (44%) | 85 (26%) | 245 (74%) | 85 (26%) | 245 (74%) | 85 (26%) | 245 (74%) | 85 (26%) | 845 (74%) |
| Meadow | 116 (39%) | 183 (61%) | 49 (16%) | 250 (84%) | 56 (19%) | 243 (81%) | 46 (15%) | 253 (85%) | 46 (15%) | 253 (85%) |
| Mesic Shrub | 641 (79%) | 172 (21%) | 460 (57%) | 353 (43%) | 488 (60%) | 325 (40%) | 469 (58%) | 344 (42%) | 478 (59%) | 335 (41%) |
| Total Acres | 943 (65%) | 499 (35%) | 594 (41%) | 848 (59%) | 629 (44%) | 813 (56%) | 600 (42%) | 842 (58%) | 609 (42%) | 833 (58%) |

If a great blue heron rookery is discovered, project mitigation measure will restrict activity within ¼ mile March 1st through August 31st. Because no nests are known, all associated actions such as the closure/rehabilitation of user-created roads and trails, development of staging areas, construction of an OHV bridge crossing over the Little Deschutes River (Alternative C only), and projected increase in OHV use of 2.5-5.6 percent annually would have no effects nesting on great blue herons. Therefore, there would be no negative cumulative effects. Although, the Elk Meadow Enhancement project would increase foraging habitat within meadows and riparian areas by reducing stand densities.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes at a Forest level.. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist, as with implementation of the Three Trails OHV project. The direct and indirect effects discussed would remain valid.

**Conclusion**

For Oregon, NatureServe listed great blue herons as S4 'Apparently Secure' and did not list any threats to the population (NatureServe 2009). There is conflicting science as to the effects of human disturbance (i.e. walking or motorized vehicle use). Hamann et al. (1999) found great blue herons have been known to flush from nests due to human activity. Conversely, DeMauro (1993) study showed a viewing area, visited at least once a week, 229 meters from a rookery resulted in little disturbance to the nesting great blue herons (NatureServe 2010). Bennette and Zurlke (1999) also found herons exhibited habituation to human recreation, including walking and motorized activity. Rodgers and Smith (1995) found great blue herons reacted to humans on foot more than vehicular traffic.

The Three Trails OHV project proposes closing and rehabilitating trails in riparian areas, thus leading to an increase in undisturbed acres that can be potential foraging habitat. Additionally, the Elk Meadow Enhancement project would increase habitat in meadow and riparian areas by reducing stand densities. Like the Three Trails OHV project, but at the Forest level, the Travel Management Rule may increase undisturbed habitat by prohibiting cross-country travel. Accumulatively, while there is an increase in undisturbed foraging habitat through the Three Trails OHV project, Meadow Enhancement project and the Travel Management Rule, there are no know great blue heron rookeries in the project area. Therefore, the Three Trails OHV project would not contribute to a change in viability on the Deschutes National Forest for great blue heron.

**<u>Great Gray Owl</u>**

**Ecology**

This species is associated with mature stands of mixed conifer/lodgepole pine/mountain hemlock near meadow complexes. Great gray owls do not build their own nests, but rely on other raptor nests, mistletoe platforms, broken topped snags, or artificial nest platforms. Bull and Henjum (1990) found that great gray owls tended to nest in unlogged, mature or older stands with a fairly open understory and dense overstory (60 percent or greater). In a study that included portions of the Deschutes National Forest south of LaPine, Oregon, Bryan and Forsman (1987) determined canopy cover at 11 nest sites ranged from 15-70 percent with a mean of 46.5 percent. Great gray owls have been documented using alternative nest sites and may nest more than 0.5 mile from the previous years nest (Bull and Henjum 1990). Bryan and Forsman suggested that forest/meadow associations are a preferred habitat. In fact, their research located 63 sites with great gray owls, of which 60 sites were in forests less than 0.3 km from meadows and three were in forest areas 0.30-0.8 km from the nearest meadow. Fifty-nine sites were dominated by lodgepole pine or mixtures of lodgepole pine and ponderosa pine. Four sites were in mixed coniferous forests. Bryan and Forsman stated all sites where great gray owls were located were in old-growth (45 sites) or mature (15 sites) habitat characterized by large overstory trees. They defined old-growth lodgepole pine as any stand greater than 70 years of age and old-growth ponderosa pine or mixed coniferous forests as any stand over 200 years of age. Elevations at occupied sites ranged from 1270 to 1650 meters, although great gray owls have been documented to occur at elevations up to 1890 meters in eastern Oregon.

Home ranges for breeding adults in northeastern Oregon averaged 1,112 acres and ranged from 324 acres to 1,606 acres, although they have been observed foraging up to two miles from the nest (Bull and Henjum 1990). Foraging habitat is typically defined as natural meadows greater than 10 acres in size, riparian areas, clear-cut and selectively logged areas where they forage on voles, pocket gophers, shrews, chipmunks, squirrels, and snowshoe hares.

**Existing Condition**

From a global perspective, great gray owl populations are S5, Stable, but the Oregon State Heritage Program rates the great gray as S3, 'Vulnerable' for the state of Oregon (NatureServe, 2009). Reasons as to why they are listed as Vulnerable were not given. However, the Interior Columbia Basin Ecosystem Management Project found populations to be widely distributed, although at low levels. Since 1995, survey to Region 6 protocol have shown available nesting habitat to be found in wider bands of elevation as more nests are found region-wide.

The Viable Ecosystem model was used to map potential nesting habitat in the analysis area. Lodgepole pine, ponderosa pine, white fir, and Shasta red fir Plant Association Groups (PAGs) with tree diameters exceeding 15-20 inches diameter with an open or dense canopy were used to define habitat. There are an estimated 12,246 acres of potential nesting habitat, with the habitat generally distributed near riparian systems, Royce Mountain and Walker Rim. Foraging habitat was also mapped as riparian habitat, meadows, mesic shrub areas that totaled 1,452 acres. The most suitable great gray habitat for nesting and close foraging sites are likely along the Little Deschutes River corridor and the wet meadow complex of Crescent Creek, Big Marsh/Refrigerator Creeks, and Spruce/Hemlock Creeks because of older forests adjacent to meadows and forest openings. **Great gray owl surveys were conducted in the Three Trails OHV analysis area in 2007 and 2008 with three visits completed each year with no detections of the species.** Within the project area one nesting pair has been sporadically found near Refrigerator Creek. Other observations or vocalizations of great grays outside the Three Trails OHV area have been documented along the Little Deschutes River, in Big Marsh, and in the Five Mile Draw drainage north of Highway 58.

There is no research as to OHVs having or not having conclusive effects on great gray owls. There is however, literature on human disturbance (i.e. camping activities, motorized vehicles, OHVs) effecting others owls and owls in general. Great gray owls could be affected indirectly through damage to meadows by user-created trails resulting in loss of foraging habitat. A general loss of habitat due to OHV

use and other human disturbances may occur because owls tend to avoid areas where these activities are taking place (Hamann et al. 1999). The Montana Chapter of The Wildlife Society cited a study where northern saw-whet owls left nesting areas that were within campgrounds in spring. However flammulated owls and boreal owls were found nesting in campgrounds suggesting some owls tolerate human disturbance (Hayward and Verner 1994).

In occurrence with roads, great gray owls have been see perching on roadside trees, signs, and fences. One reason for this may because the roadsides offer easier hunting for their prey, which are also attracted to these areas (Joslin and Youmans 1999; and Forman et al. 2003). Consequently, vehicle collision mortality can be a direct effect (Loos and Kerlinger 1993; Joslin and Youmans 1999). Motorized access can also decrease great gray owl habitat suitability by providing increased access to snags and other deadwood for firewood harvest (USDA 2001).

***Environmental Consequences***

**Direct and Indirect Effects**

**Alternative A**

With the selection of Alternative A the use of existing roads and user-created trails would be expected to have continued use from all motorized groups of recreationists. This results in a relatively high level of habitat disturbance as shown in Table 64 both within nesting and foraging habitats. However, the most current literature on OHV effects of great gray owls does not include whether OHV use effects or does not effect the species. Because great grays forage from dusk till dawn, there may be no overlap of OHV use and foraging times. Potential effects could be flushing of great grays from their daytime roosts when the birds are normally inactive, likely interrupting their daily resting period.

The one known nesting pair in the project area has a nest grove within 300 feet of a railroad line with almost daily use. Because the pair has been confirmed nesting at this site, there may be some level of habituation to this type of noise the pair has adjusted to. In the future, use of Maintenance Level 1 roads and user-created roads and trails would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest. This action would reduce the amount of disturbed great gray owl habitat in the project area although as previously mentioned there is no literature that currently states OHV use constitutes an effect on great gray owls. While the majority of the roads in the project area are National Forest System native surface roads with low speed requirements, several highways are present with speed limits of 55 mph. Road killed great gray owls have been recorded on the Crescent District outside the project area. This potential impact would remain with any alternative because no change would occur with these high speed travelways.

**Effects Common to All Action Alternatives (B, C, D, and E)**

All action alternatives would designate a defined OHV trail open for motorized users and also result in the closure of many user-created roads and trails and Maintenance Level 1 roads not needed for the trail or district transportation system. None of the action alternatives propose trails within ¼ mile of the known great gray owl nest. Table 5 in Chapter 2 displays the amount of roads and trails that would be closed for each action alternative. As also shown in Table 64 all action alternatives would result in a reduction in the amount of disturbed nesting and foraging habitat due to road and trail closures. While the literature is not specific that great gray owls are sensitive to OHV disturbance there could be disruption to their daily activity from OHV and motorized use near daytime roost sites. However, as mentioned in Alternative A, a nesting pair in the project area has been documented within 300 feet of a railroad line with almost daily use, so some habituation to noise may be possible for some pairs.

Associated actions to the designation of an OHV trail is the closure/rehabilitation of user-created trails and roads involving a small excavator or bobcat machinery to place rocks, boulders, logs, and/or conduct subsoiling activities to physically close the roads and trails. These activities would create short-term

increase in noise levels lasting from several hours to several days depending on the trail or road length being closed. None of these activities would occur near the one known great gray owl nest site. All alternatives would also result in the development of several staging areas to provide OHV parking, and may include toilets, fire rings, picnic tables, and allow overnight camping depending on the staging area. Table 25 displays the name and number of staging areas by alternative that would be developed. Total acreage for new staging areas would not exceed 20-25 acres. Because these sites would have concentrated human and OHV use, great gray owl utilization near these areas would not be expected except at night but only represents small fraction of the habitat available in the project area. No staging areas would be placed near the known great gray nest site.

The Three Trails OHV project does not propose removal of nesting/foraging habitat or the building new trails or staging areas in such habitat. Rather, it proposes closing and rehabilitating trails in the riparian and meadow areas, which are potential nesting and foraging habitat. All Three Trails OHV project action alternatives would increase the amount of undisturbed nesting habitat by doubling it when compared to the disturbed habitat (Table 64). Additionally, no project activities would occur within a ¼ mile of the known nest stand. If nesting great gray owls are located in the project area they would be protected from disturbing activities within 1/7 miles of an active nest March 1st through August 31st (DLRMP WL-33).

**Table 64. Comparison of Alternatives for Disturbed (Dist) and Undisturbed (Undist) Great Gray Owl Habitat Acres within the Three Trails OHV Analysis Area**

| | Alt A | | Alt B | | Alt C | | Alt D | | Alt E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist |
| **Nesting Habitat** | | | | | | | | | | |
| Great Gray Owl | 9710 (79%) | 2536 (12%) | 6312 (52%) | 5934 (48%) | 6477 (53%) | 5769 (47%) | 6229 (51%) | 6017 (49%) | 6308 (52%) | 5938 (48%) |
| Riparian | 186 (56%) | 144 (44%) | 85 (26%) | 245 (74%) | 85 (26%) | 245 (74%) | 85 (26%) | 245 (74%) | 85 (26%) | 845 (74%) |
| **Foraging Habitat** | | | | | | | | | | |
| Meadow | 116 (39%) | 183 (61%) | 49 (16%) | 250 (84%) | 56 (19%) | 243 (81%) | 46 (15%) | 253 (85%) | 46 (15%) | 253 (85%) |
| Mesic Shrub | 641 (79%) | 172 (21%) | 460 (57%) | 353 (43%) | 488 (60%) | 325 (40%) | 469 (58%) | 344 (42%) | 478 (59%) | 335 (41%) |
| Total Acres | 943 (65%) | 499 (35%) | 594 (41%) | 848 (59%) | 629 (44%) | 813 (56%) | 600 (42%) | 842 (58%) | 609 (42%) | 833 (58%) |

Alternative C proposes the construction of an OHV bridge over the Little Deschutes River south of the Two Rivers North housing subdivision. Owl use has not been documented in this area but may provide foraging habitat for the species. The bridge is not likely to adversely effect the species, if present, because of the high human use and motorized roads and trails already in place that parallels the river and that foraging use would likely occur after dark when most OHV users have shut down for the day. All action alternatives do propose the closures of some of these user-created roads and trails. OHV use is projected to increase 2.5-5.6 percent annually as the trail system becomes more widely known. While use would increase it would still be restricted to those roads and trails open for motorized use and would not result in an increase in disturbed habitats, therefore, should not result in any additional effects. Annual trail maintenance would remove up to five to ten snags on the trail system that present a hazard to trail riders however, this level is un-measurable as compared to the tens of thousands of snags likely present

across the Three Trails OHV project area and not result in any additional impacts to the species or their habitat. If nesting great gray owls are located in the project area they would be protected from disturbing activities as determined by a wildlife biologist and a season restriction put in place consistent with DLRMP standards and guidelines WL-33.

**Cumulative Effects**

The projects in Table 11 were reviewed for their potential to create additive effects that overlap in time and space to great gray owls. The zone of influence was defined as the 93,016 acre Three Trails OHV project area. The Five Buttes EIS (2007, in litigation) and the BLT EIS (2009) both proposed commercial thinning within stands identified as great gray owl nesting habitat with 255 acres planned in Five Buttes and 507 acres within BLT although not all of either project acres completely overlap with the Three Trails OHV project area. Each analysis concluded that while nesting acres would be reduced, foraging opportunities would be improved because visibility and access to the ground for prey capture would be enhanced. However, each project would retain 96 percent (Five Buttes) and 89 percent (BLT) of the nesting habitat in the project area. Because great gray owls do not need entire home ranges to be dense LOS stands and the foraging habitat is generally more open areas, as long as replacement nest stands are available, there would be no reduction in the numbers of breeding pairs that could be sustained across the analysis area. Other foreseeable projects that overlap the Three Trails OHV project are the Rim-Paunina and Elk Meadow Enhancement projects that would have a NEPA decision in 2011. Elk Meadow Enhancement project proposes small tree removal on up to 330 acres to reduce conifer encroachment into riparian and wet meadow habitats. None of the trees removed would be defined as large enough to provide a nesting structure for great gray owls. While great gray owls have not been detected in this area small tree removal could benefit the species by reducing tree density and enhance access of foraging areas. Rim-Paunina proposes the same Project Design Features and Mitigation Measures as the Five Buttes EIS and the BLT EIS to ensure distribution of habitat throughout the project area. Therefore, because no known great gray owl nest sites would be impacted by the combined projects, design features and mitigation measures maintain distribution of nesting habitat throughout a project area, and all Three Trails OHV action alternatives would result in an increase in undisturbed habitat acreage, no additive cumulative effects to great gray owls are anticipated. The Three Trails OHV project would not change the great gray population on the project or forest level.

Private land acreage is present along the Little Deschutes River corridor within the Two Rivers North subdivision. Because of the housing density it is unlikely these lands are capable of supporting nesting great gray owls. Private land is also present south of the community of Crescent Lake Junction. Housing densities are reduced in this tract especially at the south end although it is currently unknown if great gray owls are present in this area or if nesting capability would be present over the short- and long-term.

It is estimated in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist. The direct and indirect effects discussed would remain valid.

**Conclusion**

For the state of Oregon, the Oregon State Heritage Program rates the great gray as S3, ‘Vulnerable’ (NatureServe, 2009). Listed threats from NatureServe do not include OHV use. Literature research found no conclusive statements as to whether OHV use is or is not a concern for great gray owls. For owls in general, there is conflicting science on the effects of OHV use. Some literature concluded that human disturbance (i.e. camping activities, motorized vehicles, and OHVs) may have an effect on owls (Hamann et al. 1999), while others state some owls tolerate the disturbance (Hayward and Verner 1994). Specifically, research found great gray owls have been seen perching along roadsides possibly for easy foraging opportunities (Joslin and Youmans 1999; and Forman et al. 2003).

The Three Trails OHV project proposes a designated route, which keeps OHV use out of meadows and riparian areas that are potential nesting and foraging habitat. Additionally, all project action alternatives propose to close and/or rehabilitating roads and trails in meadows and riparian nesting and foraging habitat. Project implementation would result in a decrease of disturbance acres. Accumulatively, vegetation projects, BLT, Elk Meadow Enhancement and Rim-Paunina, would improve foraging habitat by reducing stand density, creating more open stands. Similar to the Three Trails OHV project, but at the Forest level, the Travel Management Rule may increase undisturbed habitat by prohibiting cross-country travel. Because no known great gray owl nest sites would be impacted by the combined projects, design features and mitigation measures maintain distribution of nesting habitat throughout a project area, and all Three Trails OHV action alternatives would result in an increase in undisturbed habitat acreage, no additive cumulative effects to great gray owls are anticipated. The Three Trails OHV project would not contribute to a change in viability on the Deschutes National Forest for great gray owls.

**Waterfowl**

**Existing Condition**

The Little Deschutes River and Crescent Creek are the primary water features in the planning area. The lack of ponds, lakes or reservoirs limits the number of waterfowl species that would be present in the Three Trails OHV area. Observations of Canada geese, mallards, and an occasional hooded merganser have been reported along the Little Deschutes River and Crescent Creek. It is assumed that mallards and Canada geese are nesting in shoreline vegetation near the calmer waters of the side channels and river oxbows. Hooded mergansers would utilize tree cavities or nest boxes for egg laying.

Human disturbance particularly during the egg laying period increases the risk of abandoned nests, nest re-location, decreased hatching success, and decreased duckling survival (Hamann 1999). The U.S. Fish and Wildlife Service studies have recognized some causes of desertion and abandonment of nests were from human disturbance, i.e. vehicles or walking to nests. Korschgen and Dahlgren (1992) stated three basic hatching effects caused by human disturbance were: (1) flushing of hens off nests may exposed eggs to heat or cold and kill embryos; (2) flushing of hens off nests may increases egg depredation and (3) creating trails or leaving a type of marker near nests to attract predators and subsequent egg and hen predation. Young waterfowl also experience effects from human disturbance by becoming separated from their mother and broods. This can increase vulnerability to predation, weather and finding food (Hamann et al.1999).

Other human disturbances that may affect waterfowl are fast movements, loud noises, and prolonged disturbances, e.g. walking and motorized vehicles. They can cause individual waterfowl or large gatherings of waterfowl, to expel energy into flying away, which may result in smaller amounts of foraging time for needed calories. A USFWS survey studied pink-footed geese reaction to road disturbance (Korschgen and Dahlgren 1992). They found the geese and their habitat were disturbed at a distance of 500 meters (1640 ft) from the road with 20 cars per day. In Rodgers and Smith's (1997) waterbird study they found a larger buffer was needed for human disturbance related to walking and boating rather than human disturbances that include all-terrain vehicle and automobiles. Their average distances for a nonbreeding waterbird buffer for walking was an average of 90 m (295 ft), whereas all-terrain vehicle buffer were an average of 78 m (256 ft). Both buffers are well within the predetermined 660 foot disturbance buffer modeled for analysis purposes therefore; the amount of disturbed habitat is probably overestimated. Bennette and Zurlke (1999) found waterbirds exhibited a tolerance to low-moderate counts of human activity, bird watching and vehicles, on trails and small roads. Some waterfowl can become habituated to certain human disturbances, while others may stay sensitive (Rodgers and Smith 1995; Joslin and Youmans 1999). When exposed to disturbance waterfowl would either flush (Korschgen and Dahlgren 1992; Hamann 1999) or become tolerant/habituated to human disturbances (Rodgers and Smith 1995; Bennette and Zurlke 1999; Joslin and Youmans 1999).

### *Environmental Consequence*

**Direct and Indirect Effects**

**Alternative A**

With the selection of Alternative A the use of existing roads and user-created trails would be expected to have continued use from all motorized groups of recreationists. This results in a relatively high level of habitat disturbance as shown in Table 64 and an assumption that some disruption of nesting waterfowl is occurring particularly along the portion of the Little Deschutes River in the analysis area. However, this section of river corridor represents only a small fraction of the total waterfowl nesting habitat available on the Crescent District. High production waterfowl nesting is present on Davis Lake and Big Marsh outside the Three Trails OHV boundary that totals 4,000-5,000 acres of nesting habitat. Therefore, the level of disturbance likely occurring from motorized and on-foot recreationists in the Three Trails OHV analysis area would be described as very minor. In the future, use of Maintenance Level 1 roads and user-created trails and roads would be subject to decisions from implementation of the 2005 Travel Management Rule on the Deschutes National Forest. This is likely to result in less motorized use especially along the Little Deschutes River and result in an increasing trend in waterfowl nest success, contributing more birds to the Pacific Flyway.

**Effects Common to All Action Alternatives (B, C, D, and E)**

All alternatives would retain some level of motorized disturbance in the riparian area particularly along the Little Deschutes River that provides waterfowl habitat. However, with implementation of the action alternatives this disturbance would lessen in time and intensity because a designated OHV trail would be defined and reduce the amount of motorized access along the river corridor. For the Three Trails OHV project riparian analysis, the 660 foot disturbance buffer was clipped to the Crescent Ranger District PAG to find how many acres were in the disturbed buffer as a surrogate for modeled habitat. This type of modeling may have overestimated habitat for waterfowl because it incorporates parts of riparian, meadow and mesic shrub areas that may not be suitable for waterfowl habitat, i.e. may be to dry or not close enough to water. Table 65 illustrates the amount of disturbed riparian acres within the Three Trails OHV project area. Each action alternative decreases the amount of riparian in the disturbance buffer and increases the undisturbed acres.

**Table 65. Comparison of Alternatives for Disturbed (Dist) and Undisturbed (Undist) Waterfowl Riparian Habitat Acres within the Three Trails OHV Project Area using a 660 foot Disturbance Buffer Applied to each Side of the Road or Trail Open to Motorized Use**

| | Alt A | | Alt B | | Alt C | | Alt D | | Alt E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist |
| Riparian | 186 (56%) | 144 (44%) | 85 (26%) | 245 (74%) | 85 (26%) | 245 (74%) | 85 (26%) | 245 (74%) | 85 (26%) | 845 (74%) |
| Meadow | 116 (39%) | 183 (61%) | 49 (16%) | 250 (84%) | 56 (19%) | 243 (81%) | 46 (15%) | 253 (85%) | 46 (15%) | 253 (85%) |
| Mesic Shrub | 641 (79%) | 172 (21%) | 460 (57%) | 353 (43%) | 488 (60%) | 325 (40%) | 469 (58%) | 344 (42%) | 478 (59%) | 335 (41%) |
| Total Acres | 943 (65%) | 499 (35%) | 594 (41%) | 848 (59%) | 629 (44%) | 813 (56%) | 600 (42%) | 842 (58%) | 609 (42%) | 833 (58%) |

All action alternatives propose OHV trails and a foot path in riparian areas on the Little Deschutes River. They all also propose non-implemented user-created trails be closed and rehabilitated within riparian areas using rock, boulders, logs, and/or subsoiling as methods to restore damaged lands. This would create short-term disturbance to waterfowl if conducted during the late spring-early summer nesting period. There would be OHV trails leading to parking areas by the Little Deschutes River, but in Alternatives B, D, and E there would be no trails crossing the river except where there is a road. In

Alternative C, an OHV bridge is proposed to be constructed over a section of riparian area and the Little Deschutes River, just south of the Two Rivers North subdivision. The bridge would be approximately 50 inches wide to accommodate OHV classes I (ATV) and III (motorcycles) but have little impact overall because it is only one crossing on an approximate five mile section of river in the analysis area.

Rodgers and Smith (1995), Bennette and Zurlke (1999), and Joslin and Youmans (1999) all reported that waterfowl habituation or tolerance is more probable when the human activity is located on trails and in low to moderate amounts which the Three Trails OHV project proposes. OHV use is projected to increase 2.5-5.6 percent a year as the trail system becomes more widely known although this use would still be restricted to those roads and trails open for motorized use and increased effects to waterfowl may not be measurable. The selection of any action alternative would decrease the amount of disturbance waterfowl experience within riparian habitat. The proposed decrease is due to eliminating cross-country travel, limiting motorized access for dispersed camping, and defining OHV trails and routes. Trail maintenance each year may result in the removal of five to ten snags that are leaning across the trails and represent a hazard to trail riders. This level of snag loss would be un-measurable when viewed across the 93,016 acre project area and the tens of thousands of snags naturally occurring. While some nesting effects are possible with the selection of any action alternative, the majority of the waterfowl production on the district occurs in Big Marsh and Davis Lake outside the project area.

**Cumulative Effects**

There are no projects in Table 11 capable of having additive effects to waterfowl that overlap in time and space with the Three Trails OHV project and therefore, no additive cumulative effects from implementing any Three Trails action alternative.

While the Two Rivers North subdivision is present along the Little Deschutes River it is unknown how this acreage may be providing habitat for waterfowl. There are OHV trails leading to and from the subdivision to the river corridor that may be impacting waterfowl habitat. However, this would represent only a small proportion of the total waterfowl nesting habitat present on the Crescent Ranger District.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not occur by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist. The direct and indirect effects discussed would remain valid.

**Conclusion**

Human disturbance particularly during the egg laying period increases the risk of abandoned nests, nest re-location, decreased hatching success, and decreased duckling survival (Hamann 1999). The U.S. Fish and Wildlife Service studies have recognized some causes of desertion and abandonment of nests were from human disturbance, i.e. vehicles or walking to nests. Conversely, Bennette and Zurlke (1999) found waterbirds exhibited a tolerance to low-moderate counts of human activity, bird watching, and vehicles, on trails and small roads. Some waterfowl can become habituated to certain human disturbances, while others may stay sensitive (Rodgers and Smith 1995; Joslin and Youmans 1999). When exposed to disturbance, waterfowl would either flush (Korschgen and Dahlgren 1992; Hamann 1999) or become tolerant/habituated to human disturbances (Rodgers and Smith 1995; Bennette and Zurlke 1999; Joslin and Youmans 1999).

In general, waterfowl would either flush from human activity (i.e. vehicular traffic, OHV use, walking) (Hamann 1999, Korschgen and Dahlgren 1992, Rodgers and Smith's 1997) or they become habituated (Rodgers and Smith's 1997, Bennette and Zurlke 1999, and Joslin and Youmans 1999). Rodgers and Smith (1995), Bennette and Zurlke (1999), and Joslin and Youmans (1999) all reported that waterfowl habituation or tolerance is more probable when the human activity is located on trails and in low to

moderate amounts which the Three Trails OHV project proposes. The Three Trails OHV project designates an OHV route, keeping OHV use out of riparian areas along the Little Deschutes where nesting habitat can occur. Similar to the Three Trails OHV project, but at the Forest level, the Travel Management Rule may increase undisturbed habitat by prohibiting cross-country travel. Therefore, locally there may be a slight increase in waterfowl production at the project level. But, due to the project's small size when compared to the contribution of lakes, larger rivers, and wetlands forest wide this would not change the viability of the waterfowl population on the Deschutes National Forest.

## Birds of Conservation Concern

In January 2001, President Clinton issued an executive order on migratory birds directing federal agencies to avoid or minimize the negative impact of their actions on migratory birds, and to take active steps to protect birds and their habitat. A Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service and the Department of Agriculture, Forest Service was signed in late 2008 to conserve migratory birds including taking steps to restore and enhance habitat, prevent or abate pollution affecting birds, and incorporating migratory bird conservation into agency planning processes whenever possible. Prior to the MOU being finalized several documents were produced for the conservation of migratory birds. These documents from the U. S. Fish and Wildlife Service included the Birds of Conservation Concern released in 2002 and the U.S. Shorebird Conservation Plan released in 2004.

The "Birds of Conservation Concern 2002" (BCC) revised in 2008 identifies species, subspecies, and populations of all migratory non-game birds that without additional conservation protection actions, are likely to become candidates for listing under the Endangered Species Act of 1973. While all of the bird species included in the BCC are priorities for conservation action, the list makes no finding with regard to whether they warrant consideration for ESA listing. The goal is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation plans. The U.S. Shorebird Conservation Plan (USFWS 2004, revised 2007) updated the 2004 Plan with new information and developed a list of U.S. and Canadian shorebirds considered highly imperiled or of high conservation concern. Conservation measures were not included but these lists should be consulted to determine reasons for conservation concern.

Bird Conservations Regions (BCRs) were developed based on similar geographic parameters. One BCR encompasses the Three Trails OHV project area – BCR 9, Great Basin. Table 66 displays the BCR species for this area, preferred habitat and whether suitable habitat is present in the project area.

**Table 66. Birds Conservation Region 9 (Great Basin) 2008 List**

| Bird Species | Preferred Habitat | Habitat in Three Trails OHV Project Area |
|---|---|---|
| Greater Sage Grouse (Columbia Basin DPS) (a) | Sagebrush dominated rangelands | No |
| Eared Grebe (nb) | Nests near shore on small freshwater lakes and reservoirs with emergent vegetation | No |
| Bald Eagle | Nests in large conifers usually near lakes, reservoirs | Yes |
| Ferruginous Hawk | Sagebrush-shrub steppe | No |
| Golden Eagle | Elevated nest sites in open country | No |
| Peregrine Falcon (b) | Cliffs | No |
| Yellow Rail | Marshes with shallow water | No |
| **Snowy Plover ©** | **Dry, sandy beach** | **No** |
| **Long-billed Curlew** | **Grasslands** | **No** |
| Marbled Godwit (nb) | Marsh/Wet Meadows | No |
| Yellow-billed Cuckoo (w. U.S. DPS) (a) | Dense riparian/cottonwoods | No |
| Flammulated Owl | Ponderosa pine forests | Yes |
| Black Swift | Cliffs associated with waterfalls | No |
| Calliope Hummingbird | Open mountain meadows, open forests, meadow edges, and | No |

| Bird Species | Preferred Habitat | Habitat in Three Trails OHV Project Area |
|---|---|---|
| | riparian areas breeding mainly at middle elevations | |
| Lewis's Woodpecker | Ponderosa pine forests | Yes |
| Williamson's Sapsucker | Ponderosa pine forests | Yes |
| White-headed Woodpecker | Ponderosa pine forests | Yes |
| Willow Flycatcher © | Breeding habitat is dense shrubs and/or tall herbaceous vegetation especially riparian willow thickets | Yes |
| Loggerhead Shrike | Open country with scattered trees/shrubs | No |
| Pinyon Jay | Juniper, juniper-ponderosa pine transition, and ponderosa pine edge forests | No |
| Sage Thrasher | Preferred breeding habitat is big sagebrush but would also use greasewood, shadscale and rabbitbrush. | No |
| Virginia's Warbler | Mountain Mahogany groves | No |
| Green-tailed Towhee | Vigorous shrub stands with high shrub species diversity and less abundant in big sagebrush habitat | Yes |
| Brewer's Sparrow | Sagebrush clearings in coniferous forests/bitterbrush | Yes |
| Black-chinned Sparrow | Dry slopes and hillsides covered with tall thick vegetation, SE and SW Oregon | No |
| Sage Sparrow | Sagebrush | No |
| Tricolored Blackbird | Cattails or tules | Yes |
| Black Rosy-Finch | Bare rock outcrops, cliffs and talus for breeding on Steens Mountain. | No |
| (a) ESA candidate, (b) ESA delisted, (c) non-listed subspecies or population of Threatened or Endangered species, (d) MBTA protection uncertain or lacking, (nb) non-breeding in this BCR | | |

**Landbird Strategic Plan**

The Forest Service has prepared a Landbird Strategic Plan (January 2000) to maintain, restore, and protect habitats necessary to sustain healthy migratory and resident bird populations to achieve biological objectives. The primary purpose of the strategic plan is to provide guidance for the Landbird Conservation Program and to focus efforts in a common direction. On a more local level, individuals from multiple agencies and organizations within the Oregon-Washington Chapter of Partners in Flight participated in developing a publication for conserving landbirds in this region. *A Conservation Strategy for Landbirds of the East-Slope of the Cascade Mountains in Oregon and Washingto*n was published in June 2000 (Altman 2000). This strategy has been used since its development in planning and projects analysis.

The Three Trails OHV project area falls within the central Oregon subprovince. The species selected in the conservation strategy represent focal species for habitat types or features considered at risk. Consistency with the Altman habitat recommendations are disclosed for those species listed in this section. Table 67 shows the focal species for the habitats that occur within the project area.

**Table 67. Priority Habitat Features and Associated Focal Species for Central Oregon**

| Habitat | Habitat Feature | Focal Species for Central Oregon |
|---|---|---|
| Ponderosa Pine | Large patches of old forest with large trees | White-headed woodpecker |
| | Large trees | Pygmy nuthatch |
| | Open understory with regenerating pines | Chipping sparrow |
| | Patches of burned old forest | Lewis' woodpecker |
| Mixed Conifer Late-Successional | Large trees | Brown creeper |
| | Large snags | Williamson sapsucker |
| | Interspersion grassy openings/dense thickets | Flammulated owl |
| | Multi-layered/dense canopy | Hermit thrush |
| | Edges and openings created by wildfire | Olive-sided flycatcher |
| Lodgepole pine | Old growth | Black-backed woodpecker |
| Meadows | Wet/dry | Sandhill crane |
| Aspen | Large trees with regeneration | Red-napped sapsucker |
| Subalpine fir | Patchy presence | Blue grouse |
| Whitebark pine | Old growth | Clark's nutcracker |

Table 66 and Table 67 list some species that are covered in other sections of this document either as an individual species or guild of species. Existing habitat conditions and potential impacts to the bald eagle, Lewis's woodpecker, white-headed woodpecker, yellow rail, and the tricolored blackbird have been discussed in the Threatened, Endangered, and Sensitive wildlife species section of Chapter 3 of the EIS. Potential impacts to the pygmy nuthatch and flammulated owl are discussed in the Rare and Uncommon species section of the EIS. The black-backed woodpecker, Williamson sapsucker, and golden eagle have been disclosed in Chapter 3 of the EIS within the Management Indicator Species section.

The following species have not been documented to occur and there is no suitable habitat present in the project area: greater sage grouse, eared grebe, Ferruginous hawk, peregrine falcon, yellow rail, snowy plover, long-billed curlew, marbled godwit, yellow-billed cuckoo, black swift, calliope hummingbird, loggerhead shrike, pinyon jay, sage thrasher, Virginia warbler, black-chinned sparrow, sage sparrow, and black rosy-finch.

The remaining twleve species identified from the lists with the potential to be found within the Three Trails OHV project area are the willow flycatcher, green-tailed towhee, chipping sparrow, Brewer's sparrow, brown creeper, hermit thrush, olive-sided flycatcher, sandhill crane, red-napped sapsucker, blue grouse, Clark's nutcracker and calliope hummingbird. These are discussed below.

**<u>Willow Flycatcher</u>**

**Ecology and Existing Condition**

Marshall et al. (2003) describes the willow flycatcher as a relatively late-arriving migrant to Oregon that is associated with shrub-dominated habitats, especially riparian willow thickets. Breeding habitat is characterized by dense shrubs and/or tall herbaceous plants with scattered openings of shorter herbaceous vegetation. Marshall's et al. (2003) book *Birds of Oregon* displays a map showing locations of willow flycatchers by county although few sightings exist for southern Deschutes and northern Klamath Counties compared to the rest of the state. Three requirements for willow flycatcher habitat are large meadow size, water, and willows (Sanders and Flett 1989). Nest sites tend to be in shrubs or other shrub-level

vegetation within a few feet of the ground. Territories tend to be small approximately one acre. Diets have not been studied in Oregon but the species is an aerial insectivore that feeds primarily on the wing and occasionally gleans (Sedgewick 2000 cited in Marshall et al. 2003). Factors indicated as a conservation concern include loss and degradation of the quality of riparian shrub habitats from altered hydrologic regimes, disturbance, and loss of habitat from overgrazing, and cowbird parasitism. Proposed conservation strategies are to increase width of riparian shrub zones through plantings, discourage aggregations of livestock near riparian areas, and eliminate willow cutting and herbicide use in the riparian zone. The current NatureServe Conservation Status Rank for willow flycatcher in Oregon is a S4, 'Apparently Secure', and Nationally at G5, 'Secure' (2009). Breeding bird surveys (BBS) for the last 30+ years indicate significant population declines of 3.6 percent per year in western Oregon and Washington and northwest California (Sauer et al. 2000 cited by Marshall et al. 2003).

Viable Ecosystem analysis was done for the willow flycatcher using a definition of meadows, mesic shrubs, and riparian plant association groups. Analysis showed a total of 272 acres of potential nesting habitat with the best habitat along the Little Deschutes River and very limited acreage along Crescent Creek. Their nest habitat consists of riparian areas with the presence of dense willow clumps, or other shrubbery, and uplands. Nesting uplands are low elevation valleys to high mountain areas in early seral stages of high conifer dominated stands (Marshall et al. 2003). Observations of willow flycatchers have not been reported within the Three Trails OHV area or the Crescent Ranger District. However (Spencer, pers. comm. 2009) reported a willow flycatcher location near Crescent Creek on private land approximately one mile from the Crescent District boundary while conducting a Breeding Bird Survey (BBS). His survey route also included a station on Highway 58 where it crosses the Little Deschutes River in the project area although no willow flycatchers were found there.

***Environmental Consequence***

**Direct and Indirect Effects**

**Alternative A**

The selection of Alternative A would result in a continuation of the current condition which has very few motorized restrictions, except in a few key management areas. While it is currently unknown if the species is currently present in the analysis area, potentially suitable nesting habitat does exist in pockets and patches along Crescent Creek and the Little Deschutes River corridor above Highway 58. Human activity in these areas generally begins in May and continues through October with dispersed camping, trout fishing, hunting, mushroom harvesting, and OHV riding as the major recreational activities. The high level of use may be resulting in disturbance to willow flycatchers although they are not known to occur in the project area based on Spencer's BBS (pers. comm. 2009). It is assumed that recreational impacts within the riparian zone would continue to occur with this alternative. In the future, use of Maintenance Level 1 roads and user-created roads and trails would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest. This would reduce the amount of motorized access along the Little Deschutes River that may potentially impact willow flycatcher habitat and improve nesting success if the species is present though it has yet to be detected.

**Table 68. Comparison of Disturbed (Dist) and Undisturbed (Undist) Willow FlyCatcher Nesting Habitat Acres with the Three Trails OHV Project with a 660 foot Buffer Applied to all Motorized Roads and Trails**

| | **Alt A** | | **Alt B** | | **Alt C** | | **Alt D** | | **Alt E** | |
|---|---|---|---|---|---|---|---|---|---|---|
| Total | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** |
| 272 acres | 246 (90%) | 26 (10%) | 194 (71%) | 78 (29%) | 185 (68%) | 87 (32%) | 182 (67%) | 90 (33%) | 182 (67%) | 90 (33%) |

**Effects Common to All Action Alternatives (B-E)**
Alternatives B-E would limit OHV use to designated open roads and trails. Therefore, impacts to habitat would be reduced by the closing of roads and user-created trails not part of the designated system as shown in Table 68. Because of the similarities in road and trail closures, all action alternatives have nearly identical amounts of disturbed habitat and show a reduction from 90 percent of the nesting habitat disturbed in Alternative A down to 67 to 71 percent. If willow flycatchers occupy these willow stands in the future, increased nesting success may result from having less motorized access into the riparian zone of the Little Deschutes River.

Other associated actions include the closure/rehabilitation of user-created roads and trails not needed for the trail system or district transportation system. Rocks, boulders, or logs would be used to close roads and trails using a bobcat or small excavator and subsoiling may also occur as needed to restore these lands and allow native vegetation to re-establish itself. The activities would have only a very short-term effect on additional disturbance lasting a few hours to a couple depending on the length of trails and roads being rehabilitated. The long-term effect is improved nesting habitat. Staging areas are also proposed for development to allow for OHV parking and may include toilets, picnic tables, fire rings and some may allow for overnight camping. However, none of the proposed staging areas are within the riparian zones of the Little Deschutes River or Crescent Creek which may be providing habitat for this species, so no impact would occur.

One noticeable difference between the action alternatives is that Alternative C proposes construction of an OHV bridge across the Little Deschutes River, just south of the Two Rivers North subdivision. The bridge would be approximately 50 inches wide to accommodate OHV classes I (ATV) and III (motorcycles). One way the construction of the bridge would reduce OHV impact along the Little Deschutes River riparian area is by creating a crossing over the riparian area instead of OHV users riding through the riparian areas looking for a stream crossing. The estimated impact area by the bridge would be less than one percent of the length of the Little Deschutes River corridor in the project area.

OHV use is projected to increase 2.5-5.6 percent each year as the trail system becomes more widely known and attracts more users. The increased use would still be restricted to those roads and trails open for use and would not result in additional disturbed habitat for the willow flycatcher.

**Cumulative Effects**
Table 11 was reviewed for project with the potential for additive cumulative effect overlap in time and space with Three Trails. The zone of influence was defined as the 93,016 acre Three Trails OHV project area. The BLT Vegetation EIS project proposes one unit for spot burning of decadent willow to rejuvenate willow clumps along the Little Deschutes River south of the Two Rivers North subdivision. However, because of the willow condition this section would not be considered nesting habitat. A foreseeable project is the Swamp Creek, Spruce Creek, Hemlock Creek riparian restoration CE proposed for approval in late 2010. This action proposes up to 330 acres of small tree thinning in several riparian zones to reduce conifer encroachment and allow native shrubs including willow, to re-establish and provide a forage base for big game, resident and neotropical birds. Over time, willow density may provide potential nesting habitat for willow flycatchers. Because the Three Trails OHV project would improve nesting habitat by a reduction in motorized disturbance and that no other overlapping projects are projected with negative effects, there are no anticipated cumulative effects.

Field observations indicate potential nesting habitat is present along the private portion of the Little Deschutes River that bisects the Two Rivers North subdivision. However, it is unknown if the species is present along this segment of the river.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist. The direct and indirect effects discussed would remain valid.

**Green-tailed Towhee**

**Ecology and Existing Condition**

Gilligan et al. (1994) stated the green-tailed towhee is a locally fairly common to uncommon summer resident in south-central and south-eastern Oregon, in the central and south Cascades, and the Siskiyou Mountains. It is locally very uncommon summer resident in the Blue Mountains and rare on the east slope of the north Cascades and in north-central Oregon north of Jefferson County. Habitats utilized east of the Cascades include open slopes and ponderosa pine and juniper forests with a dense brush cover of manzanita, sagebrush, bitterbrush, buckbrush, and mountain mahogany. On the east slope of the central and southern Cascades, breeders are fairly common in open ponderosa pine forests and in Klamath County, extend into higher-elevation forests types, occasionally to over 6,000 feet. There is also some post-breeding movement to higher elevations including timberline in August and September. The species is known to use riparian areas in dry open country for nesting (Gilligan et al. 1994) but also utilize vigorous shrub stands with high shrub species diversity (Knopf et al. 1990 cited by Marshall et al. 2003). Nests in Oregon are not well described but generally located in low bushes close to the ground, woven of grasses and lined with hair, sometimes of porcupine (Gabrielson and Jewett 1940 cited by Marshall et al. 2003). Dobbs et al. (1999) reported the species is known to eat a variety of insects, weed seeds, and fruit such as serviceberries, elderberries, and even raspberries.

The current NatureServe Conservation Status Rank for green-tailed towhee in Oregon is a S4B, 'Breeding Population 'Apparently Secure', and Nationally at G5, 'Secure' (2009). BBS data show marginally significant increases for Oregon 1982-1991 but show overall slight decrease (negative 1.7 percent/yr) from 1966 to 2000 (Sauer et al. 2001). Dobbs et al. (1999) stated interpretations of BBS data may vary and populations of this species may not be accurately sampled by BBS methods. Effects of human-caused alterations to habitat are complicated and poorly understood. Fire suppression in mountain forests may degrade breeding habitat by reducing the amount of brushy openings and this species may benefit from habitat fragmentation caused by logging (Marshall et al. 2003).

No Viable Ecosystem analysis was done for the green-tailed towhee. Their nest habitat can consist of high diversified shrub stands, grasslands, clearcuts with snowbrush, ceanothus, manzanita, conifer saplings, and conifer areas adjacent to ponderosa patches (Marshall et al. 2003). Nesting habitat can be found mainly in the northern portion of the analysis area, but also scattered throughout. Highly diverse shrub stands are present on Royce Mountain, Odell Butte, and areas on Walker Rim.

There are no observation records of green-tailed towhees within the analysis area, although Spencer (pers. comm. 2009) reported the species being present near the Black Rock lava pit, near Saddle Butte, and Cryder Butte on the Crescent District while conducting a BBS route.

### *Environmental Consequences*

**Effects Common to Alternatives**

At the present time it is unknown how distributed the species may be in the analysis area or across the district and to what level of disturbance OHV use may be occurring. Barton and Holmes (2007) conducted a study of off-highway trail impacts to breeding songbirds in northeastern California. They reported that spotted towhees (similar species to Green-tailed towhees) were less abundant on recreational trails and this is consistent with another study (Holmes and Geupel 2005). However, Barton and Holmes (2007) also stated it was unclear if the reduced abundance was because they avoided trails or because trails reduced the amount of available habitat. Their results also suggest that species that are prone to nest

abandonment or desertion, or that they do not re-nest after failure, would be affected by OHV trails although conversely some shrub-nesting species may benefit from reduced predation rates. Due to the small sample sizes they could not infer which species may benefit or suffer due to these particular effects. Off-highway and other motorized use is likely occurring adjacent to younger and open forested stands with manzanita and/or ceanothus present which may be providing nesting habitat for the species.

**Alternative A**

As shown in Table 69, Alternative A has the highest overall motorized route density across the combined 16 subwatersheds within the Three Trails OHV project area. It is assumed many of these routes bisect highly diversified shrubland that provide nesting habitat for the green-tailed towhee. With the selection of this alternative all roads and user-created trails would remain open for motorized use and continue to disturb green-tailed towhee habitat resulting in decreased habitat availability and nest success. In the future, the use of Maintenance Level 1 roads and user-created roads and trails would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest. This decision would be expected to reduce motorized travel within shrub habitats occupied by the green-tailed towhee and result in greater abundance and improved nesting success in areas where road and trail closures would occur.

**Table 69. Change in Motorized Route Densities on National Forest System Lands Only Averaged Across all Sixteen Subwatersheds within the Three Trails OHV Project Area**

| Subwatershed Acres | Alt. A* Motorized Density Miles/Miles$^2$ (Roads + Trails) | Alt. B Motorized Density Miles/Miles$^2$ (Roads + Trails) | Alt. C Motorized Density Miles/Miles$^2$ (Roads + Trails) | Alt. D Motorized Density Miles/Miles$^2$ (Roads + Trails) | Alt. E Motorized Density Miles/Miles$^2$ (Roads + Trails) |
|---|---|---|---|---|---|
| 161,971 | 4.29 | 2.83 | 2.55 | 2.53 | 2.51 |

* Alternative A includes all Level 1 roads in the total density

**Effects Common to All Action Alternatives (B-E)**

Implementation of Alternative B, C, D, or E would close the district to off-road travel, allowing OHV use on designated roads, routes, and trails within the Three Trails OHV project area. The selection of any of these alternatives would no longer allow user-created trails to be constructed and user-created trails not designated as part of the trail system would be closed and rehabilitated. This would reduce the roads and trails that traverse through shrublands assumed to be occupied by green-tailed towhees. As shown in Table 69, all action alternatives result in a much reduced motorized density in the combined 16 subwatersheds that completely or partially overlap the Three Trails OHV project area. Consequently, the reduction in open route densities would equate to increased amounts of undisturbed nesting habitat and likely improved nesting success.

Other associated actions include the closure/rehabilitation of user-created trails and roads with the placement of rocks, boulders, logs, and subsoiling as needed. These actions would create very short-term disturbance while activities are on-going if conducted during the nesting season but would only last a few hours to a couple days. The benefits would be long-term for as long as the roads and trails remain closed.

Up to five new staging areas would be developed to provide for OHV parking and may include toilets, picnic tables, fire rings and some may allow for overnight camping. The largest sites would range from three to five acres in size and less developed sites with fewer amenities would average one to two acres each. Because concentrated human and OHV would occur in the staging areas, it is unlikely these sites

would be occupied by nesting green-tailed towhees but the total acreage impacted would be less than 20-25 acres spread across the 93,016 acre project area, therefore having little overall impact.

One noticeable difference between the action alternatives is that Alternative C proposes construction of an OHV bridge across the Little Deschutes River, just south of the Two Rivers North subdivision. The bridge would be approximately 50 inches wide to accommodate OHV classes I (ATV) and III (motorcycles). One way the construction of the bridge would reduce OHV impact along the Little Deschutes River riparian area is by creating a crossing over the riparian area instead of OHV users riding through the riparian areas looking for a stream crossing. The estimated impact area by the bridge would be less than one percent of the length of the Little Deschutes River corridor in the project area.

OHV use is projected to increase 2.5-5.6 percent each year as the trail system becomes more widely known and attracts more users. The increased use would still be restricted to those roads and trails open for use and would not result in additional disturbed habitat for the green-tailed towhee. Because each action alternative would result in a reduction of roads and trails open for motorized travel, less shrubland habitat would be impacted allowing for greater abundance of green-tailed towhees to occupy for nesting purposes and likely improved nesting success.

**Cumulative Effects**

Table 11 was reviewed for projects with the potential for additive effects that overlap in time and space with Three Trails. The zone of influence for the green-tailed towhee is defined as the 93,016 acre project area. For the green-tailed towhee, the greatest potential for effect is from loss of shrub diversity (nesting habitat) caused by prescribed burning and mastication (mowing of shrubs). Those past and present projects areas that overlap include the BLT EIS (USDA, 2009) with treatment areas in the Muttonchop, Little Odell, and Bunny Butte areas, the Five Buttes EIS (USDA 2007) on Royce Mountain and the north slope of Odell Butte, and brush mastication and prescribed burning associated with the Maintenance Burn CE on acreage located east of Highway 97. Each of these NEPA vegetation documents had Project Design Features for the retention of 15-20 percent of treatment units left in an unmanaged condition for nesting birds, small mammal habitat, and big game forage. These protections were also carried forward into the prescribed burning plans associated with each project.

The Rim-Paunina project is a foreseeable action with a decision expected in the spring of 2011 that would conduct vegetation management including silvicultural treatments on approximately 10,000-13,000 acres of land that completely overlaps the Three Trails OHV project area. Of the 10,000-13,000 acres approximately 8,000 acres would also have fuels reduction actions proposed including use of prescribed fire, brush mastication, limb pruning, and small diameter green tree thinning. Some of this acreage has ceanothus and manzanita that is likely providing nesting habitat for the green-tailed towhee although the exact acreage amount has not been determined at this time. Project Design Features in the EIS and prescribed burn plans would have similar requirements for the retention of unmanaged lands to provide nesting habitat.

Prescribed burning and mastication would remove nesting habitat for the green-tailed towhee where dense shrubs are present. Depending on the prescribed fire return interval some of the shrubs would regenerate and provide nesting habitat until prescribed fire is applied again. While some nesting habitat would be removed the application of fire would more closely mimic natural disturbance events that occurred in ponderosa pine plant associations. Nesting habitat would still be retained across treatment units although in smaller patches as well as in unmanaged stands not selected for vegetative treatments in these NEPA documents. Collectively, the present and foreseeable vegetation actions proposed would result in a reduction in shrub habitat in the project although the mitigation measures proposed would still maintain well distributed nesting habitat within the 93,016 acre Three Trails OHV project area. This would add a slight additive cumulative effect but would also be countered by the reduction in road and trail density

where no prescribed burning or brush mastication would occur allowing for increased abundance of green-tailed in previously disturbed habitats.

As previously mentioned the NatureServe Conservation Status Rank for green-tailed towhee in Oregon is a S4B, 'Breeding Population Apparently Secure', and Nationally at G5, 'Secure' (2009). BBS data show marginally significant increases for Oregon 1982-1991 but show overall slight decrease (negative 1.7 percent per year) from 1966 to 2000 (Sauer et al. 2001).

Green-tailed towhee habitat on private land is very limited and is likely restricted to the west side of Royce Mountain. However, home owners have the option of removing shrub habitat as a fire risk reduction activity. Therefore, it is unlikely private lands in the Three Trails OHV project area would provide long-term nesting habitat for the green-tailed towhee that could contribute to the species.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist. The direct and indirect effects discussed would remain valid.

## Landbird Focal Species for Central Oregon

### Chipping Sparrow and Brewer's Sparrow

**Ecology and Existing Condition**

Chipping and Brewer's sparrows can be found in open coniferous forests or stands of trees interspersed with grassy openings or low foliage and are found in good numbers in central Oregon in juniper, ponderosa pine, and lodgepole pine forests (Marshall et al. 2003). Both species seem to be associated with higher elevations, with the Brewer's sparrow occupying the widest elevation band, up to 6,000 feet in the Cascades. The primary plant association used by the Brewer's sparrow is big sagebrush however they are not limited to sagebrush habitats and utilize a variety of shrub habitats (Marshall et al. 2003). Both species are summer residents preferring open habitats with a shrub or grass component. Chipping sparrows occupy successional habitats after logging or burning because of an affinity for open stands, older stands of western mixed conifer forest (DeGraaf and Rappole 1995). Brewer's sparrows have also been observed along the Cascade summit in stunted mountain hemlock (Marshall et al. 2003).

The current NatureServe Conservation Status Rank for chipping and Brewer's sparrows in Oregon is a S4, 'ApparentlyS, and Nationally at G5, 'Secure' (2009). Breeding bird surveys have shown an annual 2.6 percent population decline in Brewer's populations from 1966-1998. The reasons for the decline are unknown, but habitat loss to agriculture, cattle grazing, and invasion of exotic plants have been implicated. Annual population declines of chipping sparrows have averaged 3.9 percent annually in Oregon due to decrease in wildfire to maintain open woodlands but also due to cowbird brood parasitism and competition with house sparrows and house finches (Marshall et al. 2003). District written observational records do not have either species as documented. However, chipping sparrows have been observed on the Crescent Ranger District by wildlife crew members during goshawk surveys (K. Boucher, pers. comm. 2009).

The majority of literature on effects for Brewer's and chipping sparrows are tied to vehicular traffic and roads. There was little literature on trail impacts specifically to Brewer's or chipping sparrows. The literature generally discussed vehicle and trail impacts for songbirds, also known as passerine species. Impacts known to affect songbirds are noise and proximity from roads and trails. For example, noise can affect avian species by masking mating songs or communication calls (Konish 1970; Marler et al. 1973; Klump et al. 1984; Reynolds et al. 1992; Wollerman 1998 in AMEC 2005; and AMEC 2005). Species cannot hear territory calls, mating calls, or low frequency noise from predators with increased background

noise from vehicles (Klump et al. 1984; Reijen and Foppen 1994; Joslin and Youmans 1999; and Erbe et al. 1999 in AMEC 2005). Studies also found that the further away from the road or trail the more abundant the passerine species are (Sauvajot 1998; Miller et al. 1998; Forman 2000; and Barton and Holms 2006). Some literature was found specifically for Brewer's sparrow requiring a large breeding patch size of 600 acres per breeding pair (Walker 2004). Their breeding patch size is threatened by large scale reduction and fragmentation of habitat from roads and power-lines. A study in Wyoming found a 39-60 percent density reduction in Brewer's sparrows and sage sparrows within 100 meters of roads with traffic volumes of ten to 700 vehicles per day (Ingerlfinger and Anderson 2004).

Because both species share similar habitats, the Viable Ecosystem model of the chipping sparrow was used to estimate acres of suitable habitat for these species. The definition used was open canopied stands of lodgepole pine, ponderosa pine, white fir, and mountain hemlock with tree diameters 10-15 inches or larger. This definition resulted in an estimated 8,312 acres of potentially suitable nesting habitat scattered throughout the project area. This included approximately 800 acres on private land south of Crescent Lake Junction. Large clusters of habitat are located on Little Walker Mountain, near the Crescent District and Fremont-Winema National Forest boundary, and between Bunny Butte and Little Odell Butte. This figure accounts for all past and present timber sales, natural events such as wildfires.

***Environmental Consequences***

**Alternative A**

**Direct and Indirect Effects**

With Alternative A, motorized use would continue on all existing open and closed roads and user-created trails. As shown in Table 70, currently 76 percent of the chipping and Brewer's sparrow nesting habitat is subject to motorized disturbance, based on a 200 meter (660 ft) disturbance buffer on each side of a road or existing user-created trail. However, this buffer may overestimate effects to both species based on the Ingerlfinger and Anderson (2004) study showing reduced species density within 100 meters (330 ft) from a roadside though the study measured impacts out to 600 meters from roads.

For Alternative A, there are multiple high speed paved roads and several Forest Service roads with traffic volumes of ten or more OHV and vehicles per day within the Three Trails OHV project area. Nesting habitat 100 meters (330 feet) from these roads would likely experience similar disturbance levels Ingerlfinger and Anderson (2004) found in their study. However, the majority of the roads within the Three Trails OHV project area do not experience the minimum ten vehicles per day threshold described by the Ingerlfinger and Anderson (2004) study during the breeding season for both species. The exception would be where there are active timber sales and their associated traffic of service vehicles, logging or chip trucks. While road volume does increase during the hunting and matsutake mushroom seasons beginning in late August and early September, the increase occurs after the nesting period for the Brewer's and chipping sparrow.

**Effects Common to All Action Alternatives (B-E)**

A 660 foot road buffer was modeled to determine the disturbed distance on each side of an open motorized route for the entire Three Trails OHV project area. This buffer was joined with Viable modeling to find acreage area of disturbance within potential nesting habitat for each of the alternatives. Though Viable Ecosystem modeling was not done for the Brewer's sparrows, they share similar habitat with chipping sparrows and as such the chipping sparrow modeling includes Brewer's sparrow habitat.

**Table 70. Comparison of Alternatives for Disturbed (Dist) and Undisturbed (Undist) Chipping Sparrow Habitat Acres within the Three Trails OHV Analysis Area with a 660 foot Buffer Applied to each side of Motorized Roads and Trails Open for use**

| | Alt A | | Alt B | | Alt C | | Alt D | | Alt E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** |
| Chipping Sparrow | 6287 (76%) | 2025 (24%) | 4257 (51%) | 4055 (49%) | 4678 (56%) | 3634 (44%) | 4444 (53%) | 3868 (47%) | 4473 (54%) | 3839 (46%) |

Alternatives B, C, D, and E would designate an official OHV travel system and other roads identified as open for motorized vehicle travel. Those roads and trails not designated would become officially closed for vehicle use. Closing roads and trails would result in a measurable improvement to chipping sparrow habitat free of motorized disturbance as shown in Table 70 and provide for a greater density of nesting chipping and Brewer's sparrows within the project area. OHV use is projected to increase 2.5 to 5.6 percent per year with the new system and open roads may also experience an increase in volume. However, all use would still be restricted to those roads and trails open for use and not result in any additional disturbed habitat not shown in Table 70.

Other associated actions include the closure/rehabilitation of user-created trails and roads with the placement of rocks, boulders, logs and subsoiling as needed. These actions would create very short-term disturbance while activities are on-going if conducted during the nesting season but would only last a few hours to a couple days. The benefits would be long-term for as long as the roads and trails remain closed.

Up to five new staging areas would be developed to provide for OHV parking and may include toilets, picnic tables, fire rings and some may allow for overnight camping. The largest sites would range from three to five acres in size and less developed sites with fewer amenities would average one to two acres each. Because concentrated human and OHV would occur in the staging areas, it is unlikely these sites would be occupied by nesting chipping sparrows and Brewer's sparrows but the total acreage impacted would be less than 20-25 acres and has been accounted for in the disturbed habitat shown in Table 70.

One noticeable difference between the action alternatives is that Alternative C proposes construction of an OHV bridge across the Little Deschutes River, just south of the Two Rivers North subdivision. The bridge would be approximately 50 inches wide to accommodate OHV classes I (ATV) and III (motorcycles). One way the construction of the bridge would reduce OHV impact along the Little Deschutes River riparian area is by creating a crossing over the riparian area instead of OHV users riding through the riparian areas looking for a stream crossing. The estimated impact area by the bridge would be less than one percent of the length of the Little Deschutes River corridor in the project area and the disturbed habitat impact has been accounted for in Table 68 for Alternative C.

OHV use is projected to increase 2.5-5.6 percent each year as the trail system becomes more widely known and attracts more users. The increased use would still be restricted to those roads and trails open for use and would not result in additional disturbed habitat for the chipping sparrow and Brewer's sparrow. Because each action alternative would result in a reduction of roads and trails open for motorized travel, less open forest and shrubland habitat would be impacted allowing for greater abundance of both species for nesting purposes.

**Cumulative Effects**

Table 11 was reviewed for projects that, in combination with Three Trails OHV, would have the potential for overlap in time and space and result in additive effects. The zone of influence is defined as the 93,016 acre Three Trails OHV project area. Because these species are associated with open forest conditions all projects that propose commercial thinning (stand density reduction) resulted in improved habitat, except

where prescribed fire or mastication was used. The BLT EIS (USDA 2009) and the Maintenance Burn CE (USDA 2005) proposed prescribed fire and/or mastication on 2,312 acres and 1,933 acres respectively, with some of that acreage overlapping the Three Trails OHV project area. The Five Buttes EIS (USDA 2007, in litigation) proposes management actions on 7,797 acres including commercial and pre-commercial thinning and prescribed fire that also partially overlaps the Three Trails OHV analysis area. Collectively, these projects would reduce the amount of shrub habitat in the treatment units although Project Design Features and mitigation measures in each NEPA document and burn plan prescriptions have specified the retention of unmanaged lands for the nesting birds, small mammal habitat, and big game forage. These actions would reduce the amount of chipping sparrow habitat impacted from burning and mastication and work to maintain the current distribution of shrub habitats and open forests utilized by these species.

A foreseeable vegetation project titled Rim-Paunina EIS with a NEPA decision expected in the spring of 2011 proposes vegetative manipulations on 10,000 to 13,000 acres. This project area completely overlaps the Three Trails OHV projected area. Understory commercial thinning and small diameter thinning green tree is proposed that would open forested stands improving chipping and Brewer sparrow habitat although prescribed fire and mastication is also proposed on up to 8,000 acres of these acres. This would remove bitterbrush, ceanothus, and manzanita that is likely providing nesting habitat for both species although the exact acreage amount has not been determined at this time. Project Design Features in the EIS and prescribed burn plans would have similar requirements for the retention of unmanaged lands to provide nesting habitat. Depending on the prescribed fire return interval some of the shrubs would regenerate and provide nesting habitat until prescribed fire is applied again. While some nesting habitat would be removed the application of fire would more closely mimic natural disturbance events that occurred in ponderosa pine plant associations. Nesting habitat would still be retained across treatment units although in smaller patches as well as in unmanaged stands not selected for vegetative treatments in these NEPA documents. Therefore, the present and foreseeable vegetation actions proposed would add a slight additive cumulative effect. However, this effect would also be countered by the reduction in road and trail density where no prescribed burning or brush mastication would occur allowing for greater utilization of nesting habitat adjacent to roads and trails that would be closed in all action alternatives.

Chipping sparrow and Brewer's sparrow habitat on private land is very limited and home owners have the option of removing shrub habitat as a fire risk reduction activity. Therefore, it is unlikely private lands in the Three Trails project area would provide long-term nesting habitat for either sparrow species.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist. The direct and indirect effects discussed would remain valid.

**Brown Creeper**

**Ecology and Existing Condition**

The brown creeper is a common but inconspicuous permanent resident in most of Oregon (Gilligan et al. 1994). The brown creeper is the only North American bird that relies on both the trunk and bark of trees for nesting and foraging. It is found predominately in the coniferous forests but can also be located in oak woodlands, cottonwood stands, and in urban areas during the winter (Marshall et al. 2003). Altman (2000) stated the brown creeper shows a preference for Douglas-fir which offers better foraging opportunities in the deeply fissured bark. It nests under loose sloughing bark of large diameter snags with little to moderate decay. Nesting in Oregon can occur from near sea level to high in the mountains (Gilligan et al. 1994). Marshall et al. (2003) reported the diameters of nest trees in the Coast Range varied from 16 inches to 42 inches dbh with the mean diameter increasing as stands mature. This species has been observed in the older mixed conifer and ponderosa pine forests of the project area although the

records have not been formally entered into the district wildlife observation database (K. Boucher, pers. comm. 2009). The current NatureServe Conservation Status Rank for brown creepers in Oregon is a S4, 'Apparently Secure', and Nationally G5, 'Secure' (2009). Threats to this species include the loss of large diameter snags and live trees. Sauer et al. (1999 cited by Altman 2000) stated there was a non-significant short-term (1980-1998) increasing trend of 3.1 percent per year for the brown creeper in the Cascade Mountains Breeding Bird Survey Physiographic Region.

Gaines et al. (2003) conducted a literature review on road and trail-associated disturbance factors affecting a number of species including the brown creeper. Gaines et al. (2003) cited several research papers including Hutto (1995) who found that brown creepers were twice as likely to occur in habitats that were more than 100 meters from a road. In addition, the review stated both Keller and Anderson (2001) and Brand and George (2001) found brown creepers populations associated with larger forest patches. Gaines et al. (2003) also determined motorized trails can act as routes for competitors or predators and resulted in displacement or avoidance of habitats near motorized trails.

The Viable Ecosystem model was used to determine an approximate number of nesting habitat acres. The definition used was all PAGs with tree diameters exceeding 15 inches with an open or closed canopy condition. This resulted in approximately 12,403 acres of nesting habitat which included some acreage on private lands likely because there are scattered mid- and late-successional sized trees currently present. This figure accounts for all past and present timber sales, natural events such as wildfires, and any other habitat altering activity that would express itself in a vegetative manner. This way of presenting information is most informative for the decision maker. The nesting habitat is primarily distributed across National Forest System lands mixed conifer PAGs on Royce Mountain and Odell Butte and within ponderosa pine PAGs east of Highway 97 and scattered acreage west of Highways 97 and 58.

***Environmental Consequence***

**Alternative A**

**Direct, Indirect and Cumulative Effects**

The selection of Alternative A would result in a continuation of the current condition where all existing roads and user-created routes would continue to be available for motorized travel. The large forest patches of habitat for brown creepers, as found in both Keller and Anderson (2001) and Brand and George (2001) studies, would continue to be bisected by existing routes and user-created trails from cross-country travel. As with findings from Gaines et al. (2003), user-created trails and existing routes could act as travel corridors for competitors and predators displacing brown creepers. In addition, the existing condition for the Three Trail OHV project area was modeled using a disturbance buffer of 200 meters (660 ft) resulting in 79 percent of the brown creeper's nesting habitat subject to motorized disturbance. However, this buffer may overestimate effects to the brown creeper based on Hutto (1995) and Gaines et al. (2003). Their findings showed reduced brown creeper occurrence within 100 meters (330 ft) from a roadside and it is unknown if those effects extended beyond that distance.

**Effects Common to All Action Alternatives**

Analysis of habitat disturbance for the brown creeper was determined by using 200 meter (660 ft) road buffer modeled on each side of an open motorized route for the entire Three Trails OHV project area (Table 71). The 200 meter (660 ft) disturbance buffer includes the 100 meter (330 ft) distance Gaines et al. (2003) and Hutto (1995) discussed as being needed for brown creepers. This buffer was joined with Viable modeling to find acreage area of disturbance within potential brown creeper nesting habitat for each of the alternatives.

**Table 71. Comparison of Alternatives for Disturbed (Dist) and Undisturbed (Undist) Brown Creeper Habitat Acres within the Three Trails OHV Analysis Area with a 660 foot Buffer Applied to each Side of a Road or Trail open for Motorized Use**

| | Alt A | | Alt B | | Alt C | | Alt D | | Alt E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist |
| Brown Creeper | 9803 (79%) | 2601 (21%) | 6349 (51%) | 6054 (49%) | 6514 (53%) | 5889 (47%) | 6266 (51%) | 6137 (49%) | 6345 (51%) | 6058 (49%) |

Table 71 shows all action alternatives result in a reduction in total acres of disturbed habitat and conversely, would more than double the amount of undisturbed habitat compared to Alternative A. The difference between the four action alternatives is only 248 acres of disturbed habitat or approximately two percent of the total brown creeper nesting habitat in the project area. This is due to reducing the amount of routes and trails open for motorized use. The increase of undisturbed habitat in each action alternative would provide for larger undisturbed patches of forest habitat used by the brown creeper. In addition, Three Trails OHV proposed routes would use roads, user-created trails, logging skid trails, or other already disturbed lands to tie trail systems to each other. This would not create further habitat fragmentation nor would any nesting habitat be lost. While annual trail maintenance may result in hazard tree removal for the safety of riders, this is projected to be less than five to ten snags per year and an un-measurable affect compared to the number of snags present in the 93,016 acre analysis area. Because undisturbed nesting habitat would increase in each action alternative, there would be a benefit the species from project implementation.

Associated actions to the Three Trails OHV project include the closure/rehabilitation of user-created trails and roads with the placement of rocks, boulders, logs, and subsoiling as needed. These actions would create very short-term disturbance while activities are on-going if conducted during the nesting season but would only last a few hours to a couple days. The benefits would be long-term for as long as the roads and trails remain closed.

Up to five new staging areas would be developed to provide for OHV parking and may include toilets, picnic tables, fire rings and some may allow for overnight camping. The largest sites would range from three to five acres in size and less developed sites with fewer amenities would average one to two acres each. Because concentrated human and OHV would occur in the staging areas, it is unlikely these sites would be occupied by brown creepers but the total acreage impacted would be less than 20-25 acres and has been accounted for in the disturbed habitat shown in Table 71.

One noticeable difference between the action alternatives is that Alternative C proposes construction of an OHV bridge across the Little Deschutes River, just south of the Two Rivers North subdivision. The bridge would be approximately 50 inches wide to accommodate OHV classes I (ATV) and III (motorcycles). However, bridge construction would not occur in stands that are currently defined as nesting habitat for the brown creeper and therefore, have no impact.

OHV use is projected to increase 2.5-5.6 percent each year as the trail system becomes more widely known and attracts more users. The increased use would still be restricted to those roads and trails open for use and would not result in additional disturbed habitat brown creeper beyond shown in Table 71.

**Cumulative Effects**

Table 11 was reviewed for projects that, in combination with Three Trails OHV, would have the potential for overlap in time and space and result in additive effects. The zone of influence is defined as the 93,016 acre Three Trails OHV project area. The Five Buttes and BLT Environmental Impact Statements (USDA 2007 and 2009 respectively) proposed understory commercial thinning of forested stands some of which

overlaps the Three Trails OHV project area. Five Buttes may result in the thinning of 4,325 acres of forest and BLT proposed 7,499 acres of commercial thinning that collectively would thin to improve forest health and reduce wildland fire risk. Both projects would focus on understory thinning of dense stands generally removing less than 21 inches in diameter and retaining the largest diameter trees. Where late-successional forest occurred before harvest, it would remain late-successional after harvest. Because the largest diameter trees would be left, treated stands would retain their capability to support brown creeper. The only potential effect is disturbance to creepers if timber harvest actions are conducted during the breeding season. Some temporary displacement may occur although this effect would be short-term normally less than two to three years or when sales are actually operating, localized to specific treatment units and unmanaged habitats would be left in each treatment unit as well as stands not selected for commercial thinning. In addition, snag removal would only occur to provide safe working conditions for forest workers. Temporary roads constructed to access treatment units would only be in place for several years until project activities have been completed. A total of 1.87 miles are proposed in the Five Buttes projects and approximately ten miles were proposed in BLT. Not all temporary roads would be in use at the same time and all temporary roads would be subsoiled and closed after the completion of all vegetative treatments. This would result in a short-term impact to brown creepers in the Three Trails OHV analysis area.

A foreseeable action is the Rim-Paunina Vegetation Management project that entirely overlaps the Three Trails OHV project area and proposes commercial thinning on 10,000-13,000 acres of forest. The silvicultural prescriptions would be very similar on most treatment units as the Five Buttes and BLT projects. A decision for this environmental impact statement is projected for the spring of 2011. This project, in addition to those described, would collectively reduce the risk of large tree loss to wildfire, insects, and disease events and maintain brown creeper into the future. The additional short-term disturbance associated with temporary road use would create a slight additive effect to the brown creeper though, tempered by the improved number of acres of undisturbed nesting habitat available resulting from planned road and trail closures.

Large tree habitat on private land is assumed to be very limited and likely not contributing to the species population in the project area. Because many homeowners are actively reducing fire risk on their properties through vegetation removal it is also unlikely there would be habitat available for the foreseeable future.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist. The direct and indirect effects discussed would remain valid.

**Hermit Thrush**

**Ecology and Existing Condition**

The hermit thrush is a summer resident preferring mid to high elevation mature and old growth forests. It breeds in mature forests of all types especially those with a shaded understory of brush and small trees ranging from aspen groves to juniper woodlands to moderately open coniferous forests. Gilligan et al. (1994) described the Hermit thrush as a fairly common summer resident in the Cascade, Siskiyou, and Blue Mountains and uncommon in the Coast Range of Oregon. Hermit thrushes nest on the ground, in brush or small trees. It is an opportunistic ground forager, feeding on insects and an occasional reptile or amphibian (Marshall et al. 2003). During the winter months they are rarely seen east of the Cascades and tend to winter in the west-side lowlands and foothills along the coast. They are considered S4, apparently stable in Oregon (NatureServe 2008). There appear to be no serious conservation problems at this time (Marshall et al. 2003). The current NatureServe Conservation Status Rank for hermit thrushes in Oregon is a S4, ‘Apparently Secure’, and Nationally at G5, ‘Secure’ (2009).

From the literature reviewed the level of sensitivity specifically to hermit thrushes to motorized disturbance is currently unknown although general impacts of OHV use to wildlife including birds may be displacement, avoidance, and/or habitat fragmentation. Species may move away from OHV trail/routes and play or staging areas due to human presence or resulting habitat changes. Romain-Bondi (2009) stated the common wildlife response to increased human activity is avoidance or displacement. The roads and trails may not provide enough protection/cover from predators and may not provide foraging and roosting areas for wildlife. Other variables that may impact wildlife include, but are not limited to noise, dust, speed, soil compaction, and possible harassment of wildlife (Romain-Bondi 2009; Ouren 2007). Ouren et al. (2007) found that OHV use can diminish nesting shrub habitat of birds and small mammals by driving over bushes resulting in breaking or killing the brush.

The Viable Ecosystem model was used to approximate acres of suitable nesting habitat in the project area. Using a definition of all PAGs with tree diameters exceeding 10-15 inches with a dense canopy resulted in an estimated 12,287 acres of nesting habitat. This figure accounts for all past and present timber sales, natural events such as wildfires, and any other habitat altering activity that would express itself in a vegetative manner. Virtually of the suitable acres are on National Forest System lands within the mixed conifer and ponderosa pine PAGs. Within the Three Trails OHV project area contiguous habitat is located on Royce Mountain, Hamner Mountain, north of Crescent Lake, Odell Butte, Bunny Butte, Muttonchop Butte, and Walker Rim. Very limited surveys have occurred on the analysis area near Crescent Creek and Shunk (2001) reported hermit thrushes present near Crescent Creek Campground.

***Environmental Consequences***

**Alternative A**

**Direct and Indirect Effects**

The selection of Alternative A would result in no change in motorized use in the project area. However, assuming some species displacement or individuals or pairs may occur, a disturbance buffer analysis was conducted as shown in Table 72. It was assumed all roads and trails are being used and a 660 foot buffer applied to each side of the motorized routes. This analysis showed 77 percent of the suitable nesting habitat is within the disturbance buffer although it is unknown if this level of disturbance is resulting in reduced nesting success in the project area.

**Effects Common to All Action Alternatives**

A disturbance buffer analysis was conducted on hermit thrush nesting habitat using a 660 foot disturbance buffer on all roads and trails open for motorized travel. The results are displayed in Table 72.

**Table 72. Comparison of Alternatives for Disturbed (Dist) and Undisturbed (Undist) Hermit Thrush Habitat Acres within the Three Trails OHV Analysis Area using a 660 Foot Buffer Applied to each Side of a Road or Trail Open to Motorized Use**

| | Alt A | | Alt B | | Alt C | | Alt D | | Alt E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** |
| **Hermit Thrush** | 9446 (77%) | 2841 (26%) | 5623 (46%) | 6664 (54%) | 5599 (46%) | 6688 (54%) | 5350 (44%) | 6937 (56%) | 5497 (45%) | 6790 (55%) |

As shown in Table 72 the action alternatives are extremely close in the amount of disturbed and undisturbed nesting habitat with only 273 acres difference (two percent) in disturbed habitat between the four alternatives. This is due to the similarities in road and user-created trail closures between alternatives. In addition, the Three Trails OHV routes would use existing roads, user-created trails, and past timber harvest skid roads for the designated system that should not result in any loss of hermit thrush

nesting habitat. All action alternatives should result in greater occupancy of the suitable nesting habitat present with a potential increase in species population.

Associated actions to the Three Trails OHV project include the closure/rehabilitation of user-created trails and roads with the placement of rocks, boulders, logs, and subsoiling as needed. These actions would create very short-term disturbance while activities are on-going if conducted during the nesting season but would only last a few hours to a couple days. The benefits would be long-term for as long as the roads and trails remain closed.

Up to five new staging areas would be developed to provide for OHV parking and may include toilets, picnic tables, fire rings and some may allow for overnight camping. The largest sites would range from three to five acres in size and less developed sites with fewer amenities would average one to two acres each. Because concentrated human and OHV would occur in the staging areas, it is unlikely these sites would be occupied by hermit thrushes and the total acreage impacted would be less than 20-25 acres and has been accounted for in disturbed habitat shown in Table 72.

One noticeable difference between the action alternatives is that Alternative C proposes construction of an OHV bridge across the Little Deschutes River, just south of the Two Rivers North subdivision. The bridge would be approximately 50 inches wide to accommodate OHV classes I (ATV) and III (motorcycles). However, bridge construction would not occur in stands that are currently defined as nesting habitat for the hermit thrush and therefore, have no impact.

OHV use is projected to increase 2.5-5.6 percent each year as the trail system becomes more widely known and attracts more users. The increased use would still be restricted to those roads and trails open for use and would not result in additional disturbed hermit thrush habitat beyond that shown in Table 72.

**Cumulative Effects**

Table 11 was reviewed for projects that, in combination with Three Trails OHV, would have the potential for overlap in time and space and result in additive effects. The zone of influence is defined as the 93,016 acre Three Trails OHV project area. The BLT project proposed 1,016 acres of commercial thinning in hermit thrush habitat and the Five Buttes project several thousand acres of vegetative treatments in hermit thrush habitat. These activities would tend to decrease canopy layering in the vertical structure to a species that shows a positive association of areas of dense understory shrubs and small tress. A minimum of 15 percent of each activity unit would be retained unmanaged and provide habitat for the hermit thrush where dense multi-layered stands exist. This would be consistent with the strategy proposed by Altman (2000) to retain tracks of forest unmanaged or lightly managed to insure structural diversity in mixed conifer forests.

A foreseeable vegetation project titled Rim-Paunina proposes vegetative manipulations on 10,000 to 13,000 acres with a NEPA decision expected in the spring of 2011. A the present time, analysis has not been completed on acres of proposed thinning and prescribed burning that may take place in hermit thrush nesting habitat and direct,indirect, and cumulative effects would be discussed as part of the analysis. Collectively, the vegetation projects that propose tree density reduction would decrease nesting habitat for the hermit thrush. While prescribed fire is proposed in many of these projects, project design features and mitigation measures would retain a minimum of 15-20 percent of the stands unmanaged for big game forage, small mammal habitat and for songbird nesting and foraging habitat. Depending on the return interval for prescribed fire some of the treated stands may return into a dense stand with understory and shrubs favored by this species and provide nesting habitat for hermit thrushes.

Collectively these projects have the potential to impact individuals or pairs of hermit thrushes, but would not adversely affect the local population because of mitigation measures and available habitats not subject

to proposed vegetation management activities. The current NatureServe Conservation Status Rank for hermit thrushes in Oregon (2010) also shows it is ranked S4, 'Apparently Secure', so vegetatation manipulations to improve forest health and restore landscapes more resilient to natural disturbances would still be consistent with Altman's recommendations to provide diversity.

**Olive-sided Flycatcher**

**Ecology and Existing Condition**

The Olive-sided flycatcher inhabits montane and northern coniferous forests up to 3,000 meters (9,842 feet) in elevation, especially in burned-over forest areas with tall standing dead trees (DeGraaf and Rappole 1995). In Oregon this flycatcher is a summer resident that breeds in low densities throughout coniferous forests. The olive-sided flycatcher is an aerial insectivore that prefers forest openings or edge habitats where forest meets meadows, timber harvest units, rivers, bogs, or marshes (Marshall et al. 2003). This species has been observed in the project area by wildlife crew members while conducting goshawk surveys (K. Boucher pers. comm. 2009). The current NatureServe Conservation Status Rank for the olive-sided flycatcher in Oregon is a S3B, 'Breeding Vulnerable', and Nationally a 4B, 'Breeding Apparently Secure' (2009). NatureServe (2010) stated that fire suppression throughout the breeding range has limited the acreage of available habitat. It also reports that the species is "Apparently Secure" globally although at risk from deforestation on wintering grounds in Central and South America.

This flycatcher is considered a contrast species using old forests for nesting and either openings or gaps in old forests for foraging. Large trees and snags are preferred habitat elements for the olive-sided flycatcher (Romain-Bondi 2009). They are positively associated with recent burns (Hejl 1994 cited by Wisdom et al. 2000). In the Three Trails OHV project area there have been two recent wildland fires, 2000 Muttonchop Fire (80 acres) and the 2008 Royce Butte Fire (382 acres) that are likely providing habitat for the olive-sided flycatcher.

There was little to no literature on recreational trail impacts specific to the olive-sided flycatcher. The literature available generally discussed vehicle and trail impacts for passerine species as a whole. Background noise from vehicles can affect avian species by masking mating songs or communication calls (Konish 1970; Marler et al. 1973; Klump et al. 1984; Reynolds et al. 1992; Wollerman 1998 in AMEC 2005; and AMEC 2005). Bird species cannot hear territory calls, mating calls, or low frequency noise from predators with increased background noise from vehicles (Klump et al. 1984; Reijen and Foppen 1994; Joslin and Youmans 1999; and Erbe et al. 1999 in AMEC 2005). Studies also found that the further away from the road or trail the more abundant the passerine species (Sauvajot 1998; Miller et al. 1998; Forman 2000; and Barton and Holmes 2006).

The Viable Ecosystem model was used to estimate acres of suitable habitat for these species. The definition used was open canopied stands of lodgepole pine, ponderosa pine, white fir, Shasta red fir, and mountain hemlock with tree diameters 5 -10 inches or larger in the lodgepole PAGs and greater than 10 inches in the remaining PAGs. This definition resulted in an estimated 16,309 acres of potentially suitable nesting habitat in the project area including lands under private ownership and is generally well distributed across the entire project. This figure accounts for all past and present timber sales and natural events such as wildfires.

***Environmental Consequences***

**Alternative A**

**Direct and Indirect Effects**

The selection of Alternative A would result in no change in the existing amount of roads and user-created trails that are being used for motorized access. As show in Table 73, 77 percent of the potential olive-sided flycatcher nesting habitat in the project area is within 660 feet of a road or motorized trail. While the research is not specific to the olive-sided flycatcher, an assumption is made that some level of noise

disturbance may be occurring to individuals or pairs particularly the closer they are to motorized routes. However, it is currently unknown how this may manifest itself into nesting success or if changes in habitat conditions such as availability of snags and open forested stands or edges is more critical to the species. This alternative would also not result in any snag loss or timber harvest capable of changing nesting habitat conditions.

**Effects Common to All Action Alternatives (B, D, and E)**

A 660 foot road buffer was modeled to determine the disturbed distance on each side of an open motorized route for the entire Three Trails OHV project area. This buffer was joined with Viable modeling to find acreage area of disturbance within potential nesting habitat for each of the alternatives. Table 73 displays the amount of disturbed and undisturbed nesting habitat for the olive-sided flycatcher expressed in acres for each alternative.

**Table 73. Comparison of Alternatives for Disturbed (Dist) and Undisturbed (Undist) Olive-sided Flycatcher Nesting Habitat Acres within the Three Trails OHV Analysis Area**

| | Alt A | | Alt B | | Alt C | | Alt D | | Alt E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** |
| Olivesided Flycatcher | 13016 (77%) | 3887 (23%) | 9253 (55%) | 7650 (45%) | 9834 (58%) | 7069 (42%) | 9310 (55%) | 7593 (45%) | 9449 (56%) | 7454 (44%) |

All action alternatives would designate an OHV trail system available for use and cross-country travel and/or use of closed roads would be prohibited. User-created trails not used for the designated system would be closed and rehabilitated. This would result in almost doubling the amount of undisturbed nesting habitat in all action alternatives as shown in Table 73. Annual trail maintenance may require the removal of five to ten snags per year and only those that are leaning over or across the trail system. This number is based on data from the Bend/Ft. Rock Ranger District OHV trail systems. While trail use is projected to increase at 2.5 to 5.6 percent/year, this increased use would still be restricted to those roads and trails designated for the trail system and not result in any additional acreage of disturbed habitat. While olive-sided flycatchers may still be subject to motorized disturbance during the nesting season (May – July) if nesting adjacent to open roads or trails, there would still be a marked increase of undisturbed nesting habitat in all action alternatives as compared to the existing condition where we assume all roads and trails are experiencing motorized use. This should result in improved levels of nesting based on less noise disturbance.

Associated actions to the Three Trails OHV project include the closure/rehabilitation of user-created trails and roads with the placement of rocks, boulders, logs, and subsoiling as needed. These actions would create very short-term disturbance while activities are on-going if conducted during the nesting season but would only last a few hours to a couple days per trail or road closed. The benefits for olive-sided flycatchers would be long-term for as long as the roads and trails remain closed.

Up to five new staging areas would be developed to provide for OHV parking and may include toilets, picnic tables, fire rings and some may allow for overnight camping. The largest sites would range from three to five acres in size and less developed sites with fewer amenities would average one to two acres each. Because concentrated human and OHV would occur in the staging areas, it is unlikely these sites would be occupied by olive-sided flycatchers and the total acreage impacted would be less than 20-25 acres and has been accounted for in disturbed habitat shown in Table 73.

One noticeable difference between the action alternatives is that Alternative C proposes construction of an OHV bridge across the Little Deschutes River, just south of the Two Rivers North subdivision. The bridge would be approximately 50 inches wide to accommodate OHV classes I (ATV) and III

(motorcycles). The river corridor would provide nesting habitat because it functions as edge habitat being adjacent to forested stands and the shrub dominated riparian zone near the river. However, the amount of habitat potentially impacted is less than one percent of the length of river corridor in the project area and would not result in a measurable change in nesting habitat capability and has been factored into the disturbed habitat Table 73 and still shows a strong increase in undisturbed habitat.

**Cumulative Effects**

Table 11 was reviewed for projects that, in combination with Three Trails OHV, would have the potential for overlap in time and space and result in additive effects. The zone of influence is defined as the 93,016 acre Three Trails OHV project area. The Five Buttes and BLT Environmental Impact Statements proposed understory commercial thinning of forested stands some of which overlaps the Three Trails OHV project area. Five Buttes (currently in litigation) may result in the thinning of 4,325 acres of forest and BLT proposed 7,499 acres of commercial thinning that collectively would thin to improve forest health and reduce wildland fire risk. These actions would tend to benefit nesting habitat for olive-sided flycatchers by reducing the risk of large tree loss that the species nests in. In addition, neither project would intentionally remove snag habitat except for safety concerns to forest workers. Snag retention would also be beneficial to the species.

A foreseeable action is the Rim-Paunina Vegetation Management project that entirely overlaps the Three Trails OHV project area and proposes commercial thinning on 10,000-13,000 acres of forest. The silvicultural prescriptions would be very similar on most treatment units as the Five Buttes and BLT projects. A decision for this environmental impact statement is projected for the spring of 2011. Collectively, these large vegetation projects have the capability for short-term effects to olive-sided flycatchers for timber harvest and prescribed underburning activities if conducted during the breeding season. However, not all treatments would be occurring at the same time or same year always resulting in undisturbed habitats for the flycatcher. Over the long-term, the reduction in motorized routes available for use and expected reduction in large tree loss to insects, fire, and disease should create more favorable nesting habitat for the olive-sided flycatcher. Therefore, cumulative effects are not anticipated to occur.

It is currently unknown how private lands in the project area contribute to olive-sided flycatcher populations. Most private lands are dominated by rural housing subdivisions with varying levels of forest. These lands would not be expected to provide nesting habitat although some birds are likely nesting on adjoining National Forest System lands and may use the less populated private land for some of their foraging needs.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist. The direct and indirect effects discussed would remain valid.

**Sandhill Crane**

**Ecology and Existing Condition**

The sandhill crane is a rare resident associated with freshwater high elevation meadow/marsh habitats and utilizes floating nests. It feeds on aquatic and terrestrial invertebrates as well as small vertebrates. Conversion of wetlands and predation of eggs and flightless young by coyotes, ravens, and other predators and loss of habitat on wintering grounds in California continue to be major threats to the sandhill crane (Marshall et al. 2003).

Within the project area two adult sandhill cranes were observed in a wet meadow complex of Hemlock Creek in 2009 (Miller pers. comm. 2009). The wet meadows of Hemlock and Spruce Creeks likely represent the only potentially suitable nesting habitat in the project area. Outside the project area nesting

sandhill cranes have been documented in Big Marsh and pairs and individuals have been observed at Davis Lake.

***Environmental Consequences***

**Effects Common to All Alternatives**

There are no roads or trails that currently traverse the wet meadow complex of Hemlock and Spruce Creek where this species has been documented to occur and none of the action alternatives propose the creation of a trail system or staging area that would traverse the meadows. Consequences, there are no direct, indirect, or cumulative effects expected to occur.

**Red-naped Sapsucker**

**Ecology and Existing Condition**

The red-napped sapsucker is a common summer resident from the eastern slopes of the Cascades eastward throughout the Blue Mountains and Wallowa Mountains but very rare west of the Cascades (Gilligan et al. 1994). It winters in the southern United States to central Panama including southern California (DeGraaf and Rappole 1995). In western montane riparian habitats, the red-naped is the most abundant woodpecker and is a key provider of nest sites for secondary cavity nesters (DeGraaf and Rappole 1995). It breeds in deciduous and mixed deciduous-coniferous forests especially in woodlands with aspen. Dead or live trees with a central decay column are needed to excavate cavities. Threats to this species include long-term degradation of aspen and other riparian forest habitats from fire suppression and the lack of hardwood regeneration (Marshall et al. 2003).

Beginning in 1999 the district implemented several aspen regeneration and enhancement projects that reduced conifer encroachment, constructed temporary big game fence exclosures, and conducted small scale underburns to enhance aspen sprouting on sites across the district. These actions are restoring and enhancing the vigor and patch size of aspen habitat present on the Crescent Ranger District that would benefit the woodpecker guild including the red-naped sapsucker. Within the Three Trails OHV project area suitable nesting habitat for this species is likely limited to aspen stands and mixed aspen-lodgepole pine and Engleman spruce sites that total approximately 22 acres. These areas range in size from two to ten acres are located along the Little Deschutes River, near Crescent Creek and Boundary Springs Campgrounds, and several narrow drainages that have permanent or seasonal water. Red-napped sapsuckers have been documented to nest in several of these areas located east of the Two Rivers North subdivision. It is unknown if aspen stands and/or mixed conifer-aspen are present in private lands in the project area and may be providing nesting habitat for the red-naped sapsucker.

For the woodpecker guild and cavity nesters, Hamann et al. (1999) and Gaines et al. (2003) citing Hamann et al. (1999) concluded only road associated factors were identified for these species based on available literature which did not suggest that recreational trail-associated disturbances including motorized use presented a problem for primary cavity excavators. Hamann et al. (1999) also stated that recreational activity is unlikely to be focused around nest sites of their species and by design, woodpeckers and other cavity users are relatively more secure from nest predation than any other group of forest birds. Therefore at the present, recreational disturbances are not known to be a major limiting factor. Road-associated factors included the negative effects of snag and down log reduction from wood cutting and safety practices along roads. However, snag felling by personal use and commercial firewood harvesters is not permitted on the Crescent Ranger District which eliminates this potential impact.

***Environmental Consequences***

**Effects Common to All Alternatives**

The most current reviews of recreational trail-associated literature including motorized use did not present a problem to woodpeckers and cavity nesters as a group. Therefore, designation of a defined OHV trail system and projected annual increases of OHV use of 2.5-5.6 percent a year is not expected to adversely

affect this guild of species. All action alternatives would have trail maintenance activities conducted each year including the projected felling of five to ten snags annually for trail rider safety and focus on staging areas where the greatest hazard exists.[46]

Because the Three Trails OHV project area is 93,016 acres and there are likely tens of thousands of existing snags present, the impact of removing of five to ten per year for trail maintenance are un-measurable. New trail layout would also avoid placing trails where snags currently exist.

Associated actions to the Three Trails OHV project include the rehabilitation of user-created roads and trail using rocks, boulders, logs, and/or subsoiling to restore these lands. A small excavator or bobcat machinery may be needed to implement this restoration. These actions would be short-term events with project completion taking from a few hours to a few days to implement for each segment. Rehabilitation is not projected to result in any impact to this group of woodpeckers. Staging areas are also proposed for OHV users including using existing campgrounds or snowparks such as Crescent Creek Campground and Junction Sno-Park. There would also be up to five new staging areas created to provide OHV parking and may include amenities like toilets, picnic tables, and fire rings. Larger staging areas maybe three to five acres in size and the small staging areas with fewer facilities would range from one to two acres in size. A maximum of five staging areas would be created in Alternative C totaling approximately 20 to 25 acres and Alternatives B, D, and E would each develop three totaling about ten acres. Because the staging areas would require some level of development and provide at least parking areas, snag removal would likely be required to reduce risk of injury to the public. However, the number of snags to be removed is likely very minimal compared to the tens of thousands of snags likely present in the 93,016 acre project area and have no measurable effect on woodpecker nesting habitat. Alternative C also proposes the construction of an OHV bridge over the Little Deschutes River. This activity is unlikely to require the removal of any snags that could be providing nesting habitat for red-naped sapsuckers and result in no impact to this species.

Because there are no motorized trails or roads that currently bisect the aspen sites or mixed conifer-aspen sites and none are proposed with any of the action alternatives. As a result, the selection of any Three Trails OHV alternative is not expected to have any direct, indirect or cumulative effects to this species.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist. The direct and indirect effects discussed would remain valid.

**Blue Grouse**

**Ecology and Existing Condition**

The blue grouse is the largest of the three forest grouse found in Oregon and is fairly common in the coniferous forests from the Cascade crest to the coast but also found in the Blue and Wallowa Mountains of eastern Oregon. They utilize a variety of habitats in the spring and summer months with insects, berries and seeds of various forbs and shrubs providing the bulk of their diet. Pelren (1996 cited in Marshall et al. 2003) stated open park-like stands of mature ponderosa pine and Douglas-fir were selected for wintering habitat where the grouse eat needles and buds. Pelren (1996) also stated that prescribed burning and other methods that maintain open park-like stands would likely benefit this species. Other winter range habitat includes stands dominated by spruce, lodgepole pine, limber pine, western hemlock, and mountain hemlock (Zwickel 1992 cited in Marshall et al. 2003). Nesting habitat ranges from nearly

[46] 2009, personal communication with Scott McNew, COHVOPS specialists, regarding hazard tree felling at the 318-mile East Fort Rock designated OHV trail system. In general, dead trees along the trail system are not felled unless they lean out over the trail.

bare ground with no overhead cover to dense vegetation beneath full forest canopies (Zwickel 1992; Pelren and Crawford 1999 cited in Marshall et al. 2003) with most successful nests beneath logs. NatureServe Conservation Status Rank (2010) lists the blue grouse S4 'Apparently Secure' in the state of Oregon.

While blue grouse are not common on the Crescent District they can be observed in riparian habitats of the project area including Cold Creek, Hemlock Creek, Basin Creek, Rabbit Creek, Spruce Creek, Swamp Creek, Crescent Creek, and the upper Little Deschutes River. The Viable Ecosystem model was used to determine estimated acres of nesting habitat for this species. For nesting and brood rearing habitat the definition used was all PAGs with open canopies with trees averaging less than five inches in diameter plus riparian habitats, meadows and mesic shrub patches. This resulted in an estimated 1,442 acres of potential nesting and brood rearing habitat. This figure accounts for all past and present timber sales, natural events such as wildfires, and any other habitat altering activity that would express itself in a vegetative manner. Private lands in the project area near Crescent Lake Junction also contain riparian habitats which may provide nesting and brood rearing habitat for this species although it is unknown how many birds are present on these lands.

The blue grouse was not included as a species in the literature reviews conducted by Hamman et al. (1999) and Gaines et al. (2003) on sensitivity to recreational disturbance during the nesting and brood rearing period of May-August. However, it is reasonable to assume that human access into riparian areas has the potential to disturb hens on nests and may temporarily cause broods to split up. Table 74 displays the amount of potentially suitable blue grouse nesting habitat in the project area using a 660 foot motorized disturbance buffer to riparian, meadow and mesic shrub habitat.

**Table 74. Comparison of Alternatives for Disturbed (Dist) and Undisturbed (Undist) Blue Grouse Riparian Habitat Acres Using a 660 Foot Buffer on Each Side of a Road or Trail Open for Motorized Use within the Three Trails OHV Analysis Area**

| | Alt A | | Alt B | | Alt C | | Alt D | | Alt E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** |
| Riparian | 186 (56%) | 144 (44%) | 85 (26%) | 245 (74%) | 85 (26%) | 245 (74%) | 85 (26%) | 245 (74%) | 85 (26%) | 845 (74%) |
| Meadow | 116 (39%) | 183 (61%) | 49 (16%) | 250 (84%) | 56 (19%) | 243 (81%) | 46 (15%) | 253 (85%) | 46 (15%) | 253 (85%) |
| Mesic Shrub | 641 (79%) | 172 (21%) | 460 (57%) | 353 (43%) | 488 (60%) | 325 (40%) | 469 (58%) | 344 (42%) | 478 (59%) | 335 (41%) |
| Total Acres | 943 (65%) | 499 (35%) | 594 (41%) | 848 (59%) | 629 (44%) | 813 (56%) | 600 (42%) | 842 (58%) | 609 (42%) | 833 (58%) |

### Effects Common to All Alternatives

Table 74 displays the amount of disturbed versus undisturbed nesting habitat available for the blue grouse. All action alternatives show an increasing trend in the amount of undisturbed nesting habitat as compared to Alternative A, based on the reduction in roads and trails open for motorized use in each action alternative. Project implementation would not result in the removal of any nesting habitat. It is unknown how many blue grouse would benefit from road closures because numbers can vary considerably from year to year depending on annual mortality (disease, predation, weather, nutrition, hunting harvest) and recruitment during the nesting and brood-rearing period. It is assumed less human and motorized presence within the riparian zones may result in improved nesting performance but locally, the degree of change may be immeasurable and may be the result of many factors including those already mentioned.

Associated actions to the Three Trails OHV project include the rehabilitation of user-created roads and trail using rocks, boulders, logs, and/or subsoiling to restore these lands. A small excavator or bobcat machinery may be needed to implement this restoration. These actions would be short-term events with project completion taking from a few hours to a few days to implement for each segment. Rehabilitation is not projected to result in any long-term impact to the blue grouse. Staging areas are also proposed for OHV users including using existing campgrounds or snowparks such as Crescent Creek Campground and Junction Sno-Park. There would also be up to five new staging areas created to provide OHV parking and may include amenities like toilets, picnic tables, and fire rings. Larger staging areas maybe three to five acres in size and the small staging areas with fewer facilities would range from one to two acres in size. A maximum of five staging areas would be created in Alternative C totaling approximately 20 to 25 acres and Alternatives B, D, and E would each develop three totaling about ten acres. However, none of the staging areas would be developed in riparian or meadow habitat where blue grouse could be nesting, therefore no impact to the species. Alternative C also proposes the construction of an OHV bridge over the Little Deschutes River. While this activity would occur within the riparian zone, it represents less than one percent of the entire length of the Little Deschutes River corridor in the analysis area and is unlikely to result in a measurable effect to the species.

OHV use is projected to increase 2.5-5.6 percent each year as the trail system becomes more widely known and attracts more users. The increased use would still be restricted to those roads and trails open for use and would not result in additional disturbed habitat for the blue grouse.

**Cumulative Effects**

Table 11 was reviewed for projects that, in combination with Three Trails OHV, would have the potential for overlap in time and space and result in additive effects. The zone of influence would be defined as the 93,016 acre Three Trails OHV analysis area. Several large-scale vegetation projects have proposed actions within blue grouse nesting and brood rearing habitat including the Five Buttes EIS (USDA 2007, in litigation) and the BLT project (USDA 2009). Approximately 6,758 acres of thinning was proposed in BLT and 7,797 acres in Five Buttes although that included stands functioning as blue grouse wintering habitat. Wisdom et al. (2000) stated that blue grouse summer range is on an increasing trend in the southern Cascades which includes the Three Trail OHV area. Both projects would restore fire as an ecological process in the montane and lower montane community groups and restore riparian shrublands recommended by Wisdom et al. (2000) to improve summer range habitat. Both projects also identified potential disturbance from management actions as a short-term impact but only when project actions were actually occurring and not all activities would be occurring at the same time.

Foreseeable actions include the Swamp Creek, Hemlock, Spruce Creek Riparian Enhancement CE projected for decision in early 2011 which would authorize small tree thinning on up to 330 acres in these three riparian zones to enhance native shrubs and deciduous trees. This would benefit blue grouse that summer and winter in this area. The Rim-Paunina Vegetation EIS, currently in the analysis phase proposes thinning and prescribed fire on 10,000 to 13,000 acres that overlaps the Three Trails OHV analysis area. At this time the number of acres of treatment that may occur within the riparian zones and/or meadow/shrubland habitat has not been completed. Direct, indirect, and cumulative effects would be disclosed in the document. Collectively, these vegetative projects are expected to result in a loss of nesting/brood rearing habitat for blue grouses but have the capability for short-term impacts due to disturbance but result in long-term gains from reduced motorized access into riparian habitats and improved shrub production for foraging and nesting sites. Therefore, additive cumulative effects are not anticipated.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this

EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist. The direct and indirect effects discussed would remain valid.

**Clark's Nutcracker**

**Ecology and Existing Condition**

The Clark's nutcracker is a resident along the crest of the Cascade Mountains usually above 4,000 feet although lower on the east slopes. They breed in open coniferous subalpine forests of pine, spruce- fir, and adjacent Douglas-fir and less often in juniper and ponderosa pine east of the Cascades (Marshall et al. 2003). In Oregon their diet includes ripe and unripe seeds of whitebark, limber, Jeffrey, and ponderosa pines, Douglas-fir, and Shasta red fir plus spiders, insects, and small mammals. Large wingless seeds of white pines are preferred (Lanner 1996; Tomback 1998 in Marshall et al. 2003). Clark's nutcrackers provide the sole mechanism of primary seed dispersal for whitebark pine (Hutchins and Lanner 1982 cited by Lorenz 2007). The abundance and widespread distribution of the Clark's nutcracker population is likely the reason the Oregon Heritage Information Center does not rank them.

The Viable Ecosystem model was used to estimate acres of suitable nesting habitat for this species. The definition used to model was Shasta red fir and mountain hemlock with tree diameters greater than 15 inches with an open or closed canopy. This resulted in a total 133 acres all on National Forest system lands on top of Royce Mountain and Odell Butte. This figure accounts for all past and present timber sales and natural events such as wildfires. Clark's nutcrackers are commonly seen during late summer and early fall at the higher elevations of the Crescent Ranger District including the Three Trails OHV planning area. District observation records do not list any known nest sites.

***Environmental Consequences***

**Alternative A**

**Direct and Indirect Effects**

A 660 foot road buffer was applied on each side of an open motorized route for the entire Three Trails OHV project area. This buffer was joined with Viable modeling to determine the amount of potential nesting habitat that could be affected by motorized disturbance. For Alternative A, 57 percent of the modeled Clark's nutcracker nesting habitat is within the disturbance zone. However, the majority of the roads on Odell Butte and Royce Mountain have been in place for decades and some level of habituation to motorized use may have occurred over time. The selection of this alternative would result in no change to the current pattern of vehicle use within the nutcracker nesting habitat. It is currently unknown what impact may be occurring to the species and there is no literature on the Clark's nutcracker's sensitivity to motorized disturbance. However, as previously mentioned the abundance and widespread distribution of the Clark's nutcracker population is likely the reason the Oregon Heritage Information Center does not rank them.

**Table 75. Comparison of Alternatives for Disturbed (Dist) and Undisturbed (Undist) Clark's Nutcracker Nesting Habitat Expressed in Acres using a 660 foot Buffer on each Side of a Road or Trail Open to Motorized Use within the Three Trails OHV Analysis Area**

| | Alt A | | Alt B | | Alt C | | Alt D | | Alt E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist |
| Clark's Nutcracker | 76 (57%) | 57 (43%) | 26 (20%) | 107 (80%) | 26 (20%) | 107 (80%) | 26 (20%) | 107 (80%) | 26 (20%) | 107 (80%) |

**Effects Common to All Action Alternatives (B-E)**

All action alternatives propose road and user-created road and trail closure that are not part of the designated trail system. As displayed in Table 75, there is a reduction in the amount of disturbed nesting habitat with each action alternative from road and trail closures. There would be no loss of nesting habitat because no new trail construction would occur near the summit of Royce Mountain and Odell

Butte. The increase in undisturbed nesting habitat may result in greater nesting success although the Oregon State Heritage Program does not show there to be a species problem at this time.

Associated actions to the Three Trails OHV project include the closure/rehabilitation of user-created trails and roads with the placement of rocks, boulders, logs, and subsoiling as needed. These actions would create very short-term disturbance while activities are on-going if conducted during the nesting season but would only last a few hours to a couple days. The benefits would be long-term for as long as the roads and trails remain closed.

Up to five new staging areas would be developed to provide for OHV parking and may include toilets, picnic tables, fire rings and some may allow for overnight camping. The largest sites would range from three to five acres in size and less developed sites with fewer amenities would average one to two acres each. None of the staging areas proposed for development are within the Clark's nutcracker nesting habitat on Royce Mountain or Odell Butte, and therefore, would have no effect. While Alternative C proposes an OHV bridge over the Little Deschutes River this is also outside modeled nesting habitat for the species, and therefore, causes no effect.

OHV use is projected to increase 2.5-5.6 percent each year as the trail system becomes more widely known and attracts more users. The increased use would still be restricted to those roads and trails open for use and would not result in additional disturbed Clark's nutcracker habitat beyond that shown in Table 75 which already included those acres.

**Cumulative Effects**

The projects listed in Table 11 were reviewed that, in combination with Three Trails OHV, would have the potential for overlap in time and space and result in additive effects. The zone of influence is defined as the 93,016 acre Three Trails OHV project area. The only project that overlaps in time and space is the Five Buttes Vegetation Management EIS (USDA 2007). It proposes to conduct commercial thinning treatments on Royce Mountain and Odell Butte although the thinning would primarily remove understory conifers. Approximately 120 acres of mountain hemlock and/or Shasta fir on Royce Mountain is proposed for thinning although not all of this acreage would be considered suitable for nesting habitat for Clark's nutcrackers. The treatment would improve seed production and the dominant overstory conifers would be retained as a seed source for the Clark's nutcracker. The only potential negative effect would be if timber harvest operations occurred during the nesting season resulting in some disturbance to nesting pairs. This effect however, would be localized and likely last only one nesting season based on the limited amount of harvest that would occur. Overall, this potential impact is unlikely to contribute an additive effect; therefore, no cumulative effects are anticipated.

**<u>Calliope Hummingbird</u>**

**Ecology and Existing Condition**

The calliope hummingbird breeds in mountains from central British Columbia south into central California and easterly into Nevada, Utah, and Wyoming. Marshall et al. (2003) describes the species as a common summer resident in the Blue and Wallowa Mountains and other high ranges east of the Cascade summit including Hart and Steens Mountain. A breeding distribution map shown in *Birds of Oregon* (Marshall et al. 2003) shows the species is listed as "probable" near the northwest corner of Klamath County where the Three Trails OHV project area is located. Calliopes frequent open mountain meadows and are also found in open forests, meadow edges, and riparian areas. Near Diamond Lake, Oregon they were found in clearcuts with an understory of snowbrush, currant, and green leaf manzanita, montane riparian mostly above 3,500 feet with willows, Sitka alder, red-osier dogwood, shrubs, and nearby meadows. Diet is assumed to be nectar from various flowers including squaw current, paintbrushes, monkey flowers, penstemons, and scarlet gilia. BBS data indicate a significant decline in Oregon's population averaging a negative 10.9 percent a year (Sauer et al. 2001) suggesting the need for

increased monitoring. NatureServe (2010) lists the Oregon population as S4 'Apparently Secure' and Nationally as G5 'Secure'.

The Viable Ecosystem model was used to determine estimated acres of nesting habitat for this species. For nesting habitat the definition used were all PAGs with open canopies with trees averaging less than five inches in diameter plus riparian habitats, meadows and mesic shrub patches. This resulted in an estimated 1,442 acres of potential nesting habitat. This figure accounts for all past and present timber sales and natural events such as wildfires. Private lands in the project area near Crescent Lake Junction, Crescent Creek, and along the Little Deschutes River also contain riparian habitats which may provide nesting habitat for this species. There is no literature available to determine how sensitive this species is to motorized disturbance but Table 76 displays the projected acres of disturbed habitat using a 660 foot motorized disturbance buffer applied to each side of a road or trail open for use similar as used for other wildlife species in this effects analysis.

**Table 76. Comparison of Alternatives for Disturbed (Dist.) and Undisturbed (Undist.) Calliope Hummingbird Riparian Habitat Acres using a 660 Foot Buffer on each Side of a Road or Trails Open for Motorized Use within the Three Trails OHV Analaysis Area**

| | Alt A | | Alt B | | Alt C | | Alt D | | Alt E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** |
| Riparian | 186 (56%) | 144 (44%) | 85 (26%) | 245 (74%) | 85 (26%) | 245 (74%) | 85 (26%) | 245 (74%) | 85 (26%) | 845 (74%) |
| Meadow | 116 (39%) | 183 (61%) | 49 (16%) | 250 (84%) | 56 (19%) | 243 (81%) | 46 (15%) | 253 (85%) | 46 (15%) | 253 (85%) |
| Mesic Shrub | 641 (79%) | 172 (21%) | 460 (57%) | 353 (43%) | 488 (60%) | 325 (40%) | 469 (58%) | 344 (42%) | 478 (59%) | 335 (41%) |
| Total Acres | 943 (65%) | 499 (35%) | 594 (41%) | 848 (59%) | 629 (44%) | 813 (56%) | 600 (42%) | 842 (58%) | 609 (42%) | 833 (58%) |

***Environmental Consequences***

**Direct and Indirect Effects**

**Effects Common to All Alternatives**

Table 76 displays the amount of disturbed versus undisturbed nesting habitat available for the calliope hummingbird. All action alternatives show an increasing trend in the amount of undisturbed nesting habitat as compared to Alternative A based on the reduction in roads and trails open for motorized use in each action alternative. Project implementation would not result in the removal of any nesting habitat. It is assumed less human and motorized presence within the riparian zones and meadow habitats may result in improved nesting performance but the degree of change may be immeasurable.

Associated actions to the Three Trails OHV project include the rehabilitation of user-created roads and trail using rocks, boulders, logs, and/or subsoiling to restore these lands. A small excavator or bobcat may be needed to implement this restoration. These actions would be short-term events with project completion taking from a few hours to a few days to implement for each segment. Rehabilitation is not projected to result in any long-term impact to the calliope hummingbird. Staging areas are also proposed for OHV users including using existing campgrounds or Sno-Parks such as Crescent Creek Campground and Junction Sno-Park. There would also be up to five new staging areas created to provide OHV parking and may include amenities like toilets, picnic tables, and fire rings. Larger staging areas maybe three to five acres in size and the small staging areas with fewer facilities would range from one to two acres in size. A maximum of five staging areas would be created in Alternative C totaling approximately 20 to 25 acres and Alternatives B, D, and E would each develop three totaling about ten acres. However, none of the staging areas would be developed in riparian or meadow habitat where the calliope

hummingbird could be nesting, therefore no impact to the species. Alternative C also proposes the construction of an OHV bridge over the Little Deschutes River. While this activity would occur within the riparian zone, it represents less than one percent of the entire length of the Little Deschutes River corridor in the analysis area and is unlikely to result in a measurable effect to the species.

OHV use is projected to increase 2.5-5.6 percent each year as the trail system becomes more widely known and attracts more users. The increased use would still be restricted to those roads and trails open for use and would not result in additional disturbed habitat for this species of hummingbird.

**Cumulative Effects**

Table 11 was reviewed for projects that, in combination with Three Trails OHV, would have the potential for overlap in time and space and result in additive effects. The zone of influence would be defined as the 93,016 acre Three Trails OHV analysis area. A foreseeable project is the Swamp Creek, Spruce Creek, Hemlock Creek riparian restoration CE proposed for approval in early 2011. This action proposes up to 330 acres of small tree thinning in several stream riparian zones to reduce conifer encroachment and allow native trees and shrubs including willows, alder, aspen and flowering plants to flourish which would provide nesting and foraging habitat. Because the Three Trails OHV project would improve nesting habitat by a reduction in motorized disturbance and that no other overlapping projects are projected with negative effects, there are no anticipated cumulative effects.

Field observations indicate potential nesting habitat is present along the private portion of the Little Deschutes River that bisects the Two Rivers North subdivision. However, it is unknown if the species is present along this segment of the river.

It is estimated that in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may not have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel would cease to exist. The direct and indirect effects discussed would remain valid.

## Big Game - Deer and Elk

### Introduction

The 93,016 acre Three Trails OHV analysis area provides summer range habitat for mule deer and Rocky Mountain elk. Both species are considered popular big game species and contribute thousands of recreational visitor days to this area during hunting seasons and for general wildlife viewing opportunities outside the hunting periods. The Oregon Department of Fish and Wildlife and Travel Oregon contracted with Dean Runyan and Associates in 2008 to conduct an economic analysis by county of fishing, hunting, and wildlife viewing (ODFW 2009). Table 77 displays the survey results that participants spent on hunting and wildlife viewing in Deschutes, Klamath, and Lake Counties. The selected counties in the table encompass mule deer summer and winter ranges and shows the high dollar value placed on consumptive and non-consumptive recreational activities in this part of Oregon.

**Table 77. Annual Estimated Expenditures toward Hunting and Wildlife Viewing in Deschutes, Klamath, and Lake Counties, Oregon**

| County | Hunting Expenditures | Wildlife Viewing |
|---|---|---|
| Deschutes | $8,480,000. | $44,291,000. |
| Klamath | $4,214,000. | $14,931,000. |
| Lake | $2,773,000. | $ 4,940,000. |
| Total | $15,467,000. | $64,162,000. |
| State Total Percent | 11.4% | 13% |
| State Total | $136,042,000. | $495,260,000. |

Table 78 displays mule deer hunting data for the three wildlife management units potentially affected by the Three Trails OHV project (ODFW 5/2009).

**Table 78. Numbers of Deer Hunters, Hunter Days, and Hunter Success in the Three Big Game Management Units within the Three Trails OHV Analysis Area (Years 2006-2007)**

| Mgmt. Unit and Counties | # of Hunters 2006 – 2007 | # of Hunter Days 2006 - 2007 | % Success 2006 - 2007 |
|---|---|---|---|
| Upper Deschutes (Deschutes and Klamath Co.) | 2,265 - 2,580 | 13,703 – 16,041 | 15 - 16 |
| Fort Rock (Klamath,Lake Co.) | 3,839 - 3,574 | 24,885 – 22,984 | 11 - 11 |
| Paulina (Crook, Deschutes, Klamath and Lake Co.) | 3,669 - 3,544 | 20,406 – 19,979 | 22 - 31 |
| Total | 9,773 - 9,698 | 58,994 – 59,004 | |
| Eastern Oregon Total | 74,257 – 74,347 | 426,295 – 416,327 | 33 - 36 |

The Oregon Department of Fish and Wildlife (ODFW) estimate 25,000 to 30,000 deer winter in the Paulina, Ft. Rock, and Silver Lake Wildlife Management Units. ODFW initiated a five year South Central Oregon Mule Deer Telemetry Study beginning in 2005 and to conclude in 2010 to monitor mule deer highway mortality and migration patterns along Highways 97 and 31 where many of these deer migrate between summer and winter ranges. A total of 360 deer have been radio collared to collect data for this study. Preliminary results of data collected by ODFW and Oregon Department of Transportation (ODOT) personnel indicates the majority of mule deer road-kill on Highway 97 occurs in a 40 mile stretch from the junction of Highways 97 and 31 near LaPine south to the junction with Highway 138 south of Chemult although mortality was significant for the entire 100 miles segment monitored from

Bend to Spring Hill (Ardt, ODFW pers. comm. 2009). The majority of the deer were killed from May through July although October is also a high mortality month when animals are migrating to winter ranges. The stretch of Highway 97 between mileposts 191-200 near the junction with Highway 58 is a documented hot spot for deer collisions based on data collected by ODOT and ODFW. The Three Trails OHV analysis area is within this segment of Highway 97 experiencing high road mortality.

ODFW's interpretation of telemetry data collected to date has indicated that some collared animals return to the same summer range area each year suggesting strong site fidelity. In addition, telemetry monitoring has shown the lands south and east of the Two Rivers North subdivision in the project area appears to hold a concentration of collared mule deer (Ardt, ODFW pers. comm. 2009). The Crescent Ranger District performed a coarse scale review of the telemetry locations and vegetation which appears to show that the lodgepole pine/bitterbrush/needlegrass and ponderosa pine/bitterbrush/needlegrass are the two dominant plant associations collared mule deer seem to be keying in on summer ranges on this part of the Crescent District. However, data available was not sufficient to determine how these plant associations are being used in relation to stand density, canopy cover, and patch size.

Preliminary data on radio collared mule deer indicate summering mule deer in the Three Trails OHV area primarily migrate easterly across Highway 97, detouring north or south around Walker Rim to winter ranges in the desert beyond the district and Deschutes National Forest boundary (ODFW 2009). Depending on weather conditions, the animals usually return to summer range beginning in April although the spring migration period can last into June. Data also suggests some does drop their fawns before reaching their desired summering area and then continue their migration with their fawns. The fall deer migration to winter ranges usually begins in October and the majority of the deer are out of the analysis area by mid-November. Some collared deer utilize the same migration route as during the spring and some individuals also appear to follow the same routes in consecutive years (Ardt 2009; Hedricks pers. comm. 2010).

Approximately 83 percent of the Three Trails OHV analysis area is within the Ft. Rock Big Game Management Unit, 14 percent within the Upper Deschutes Big Game Management Unit, and the remaining three percent is in the Paulina Big Game Management Unit. Spring deer counts are conducted by ODFW to determine population trends as compared to the management objective for each unit. Table 79 shows the April deer trend counts conducted by ODFW for the last five years within the management units potentially impacted by the Three Trails OHV project.

**Table 79. April Mule Deer Populations on Four Winter Ranges and Expressed as a Percentage of the Management Objective (MO) for each Unit (Years 2006-2010)**

| Management Unit | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Upper Deschutes (MO 2,200) | 1,200 - 55% | 1,100 - 50% | 900 - 41% | 1,100 - 50% | 1,100 – 50% |
| South Paulina (MO 11,000) | 10,300 - 94% | 9,400 - 85% | 7,900 - 72% | 7,500 - 68% | 6,800 – 62% |
| North Paulina (5,500) | 2,800 - 51% | 2,200 - 40% | 2,400 - 44% | 2,500 - 45% | 3,000 – 55% |
| Ft. Rock (MO 11,200) | 8,600-77% | 5,800 - 52% | 7,800- 70% | 5,616 - 50% | 5,300 – 47% |

Mule deer populations in most of the western United States began experiencing yet another widespread decline in the mid-1990s. The Western Association of Fish and Wildlife Agencies (2004) reported there were a multitude of factors adversely impacting mule deer populations including habitat loss to development, deterioration of forage quality and quantity, droughts, severe winter weather, competition

with other ungulates, predation, disease, poaching, and increased hunting mortality. As displayed in Table 79 mule deer populations are currently reaching only 45-55 percent of the management objectives for the Upper Deschutes, North Paulina, and Ft. Rock units indicating a steady decline over the last five years in the South Paulina unit. The population decline for big game in central Oregon is likely attributable to a combination of several factors. These include residential development, disturbance from an increase in motorized and mechanized recreation, altered migration patterns due to an increase in highway traffic, poaching, and predation also contribute. The enforcement of road closures and hunting regulations has also not kept up with the increase in human population in central Oregon. Although big game populations are decreasing, Anglin from the Oregon Department of Fish and Wildlife (2010) stated that indicators of birth rates and normal mortality rates indicate that Oregon herds are healthy. Within the Ft. Rock unit Hedricks (ODFW pers comm. 2010), reported that fawn production is good but fewer fawns are surviving to reach winter ranges due to predation, disease, highway crossing mortality, and decreasing forage quality. She also stated that buck ratios seem to be consistent although there are fewer animals overall. Preliminary data on radio collared adult mule deer mortality (total 121 animals) in central Oregon suggests that of the known mortality factors illegal harvest at 16 percent is greater than legal harvest at 14 percent, road kill at seven percent, predation at 14 percent and disease accounting for two percent of the known mortalities (Heath ODFW 2010). However, forty-seven percent of the known deer mortalities were not able to be determined to a specific cause. Overtime as more data becomes available, this could result in a change in percentages assigned to the various causes of mule deer mortality.

The Bend Field Office of ODFW estimates approximately 200 elk summer in the Three Trails OHV analysis area (ODFW 2009). These animals scatter to several winter ranges including some bands moving westerly across the Cascade Crest onto the Umpqua and Willamette River drainages and some easterly across Highway 97 into the desert. The majority of the summering elk occur in small bands along the Little Deschutes River system, the Hemlock Creek/Spruce Creek/Swamp Creek meadow complex, Odell Creek drainage, and the wet meadow complexes of tributaries of Crescent Creek. These riparian systems serve as calving grounds and are also used extensively by elk for foraging and as security habitats. The elk management objective (MO) for the Upper Deschutes unit is 700 animals. The estimated January 2010 population was 400 animals and the population is on a decline. The estimated January 2010 elk population for the Paulina/East Ft. Rock unit was 400 animals (S. George ODFW pers. comm. 2010).

*Deschutes National Forest Standards and Guidelines*

Mule deer and elk are listed as Management Indicator Species for the Deschutes National Forest and elk, in particular, can act as a barometer for species sensitive to human disturbance. The 1990 Deschutes National Forest Land and Resource Management Plan (LRMP) provides habitat management direction for big game animals. Mule deer summer range hiding areas must be present over at least 30 percent of each National Forest implementation unit. For this analysis, road densities and hiding cover are analyzed by subwatershed because they range from 5,000-25,000 acres, are large enough to analyze for hiding cover, and are the most logical bounding of effects because many other relevant factors for vegetation are analyzed at the same scale. Hiding cover definitions are provided in the methods and assumptions section at the beginning of the wildlife section. Target open road densities are 2.5 miles per square mile to achieve deer summer range habitat effectiveness targets, unless impacts on deer can be avoided or the proposed project would result in a net benefit to deer habitat. The density would be applied as an average for the subwatershed and would be used as a threshold requiring further analysis. The final judgment on open road density would be based on the “further evaluation” rather than the density guideline (LRMP WL-53).

**Table 80. Amount of Hiding Cover Present within each of the 16 Subwatersheds of the Three Trails OHV Analysis Area**

| 6th Field Subwatershed | 6th Field Acres Deschutes National Forest System Lands Only | Acres and Percent of Existing Hiding Cover |
|---|---|---|
| Cold Creek | 11,819 | 10,826 (92%) |
| Lower Big Marsh Creek | 18,642 | 13,564 (73%) |
| Middle Crescent Creek | 16,970 | 11,201 (66%) |
| Lower Crescent Creek | 8,371 | 5,638 (67%) |
| Corral Springs | 2,637 | 1,680 (64%) |
| Crescent Butte | 4,534 | 2,799 (62%) |
| Little Walker Mountain | 12,598 | 8,296 (66%) |
| North Paunina | 10,214 | 4,050 (40%) |
| North Walker | 1,061 | 883 (83%) |
| South Paunina | 9,671 | 6,551 (68%) |
| Bunny Butte | 8,517 | 5,666 (67%) |
| Clover Butte | 12,245 | 10,054 (82%) |
| Gilchrist Junction | 4,659 | 3,680 (79%) |
| Hemlock Creek | 16,867 | 12,922 (77%) |
| Little Odell Creek | 9,349 | 5,324 (57%) |
| Odell Creek | 13,839 | 9,778 (71%) |
| **Total Acres** | **161,993** | **112,912 (70%)** |

The Forest Plan (LRMP) specifies habitat conditions to be provided for elk and identified key habitat areas across the forest. All or portions of two Key Elk Areas (KEAs) are within the Three Trails OHV project: Maklaks and Hemlock. Located south and west of the Two Rivers North subdivision, the Hemlock KEA totals 2,511 acres, of which 1,953 acres are within the project boundary. A Forest Plan amendment is included in all action alternatives to shift this KEA to a location with more suitable habitat. Located at the northern most portion of the analysis area, the Maklaks KEA is 1,616 acres of which 563 acres are within the project boundary.

The Forest Plan specifies road densities should not exceed an overall average between 0.5 – 1.5 miles per square mile within each KEA, unless impacts on elk can be avoided or the proposed project would result in a net benefit to elk habitat. The road density would be applied as an average over a KEA and would be used as threshold for further evaluation. The final judgment on open road density would be based on the further evaluation rather than the density guideline (Forest Plan WL- 46). Thermal cover must be present over at least 20 percent of KEA in blocks at least 10 acres in size and have an average height of at least 40 feet. As a minimum, canopy cover must be at least 40 percent (Forest Plan WL-50). Hiding areas must be present over at least 30 percent of each KEA. Hiding and thermal cover is not proposed for removal in any action alternative.

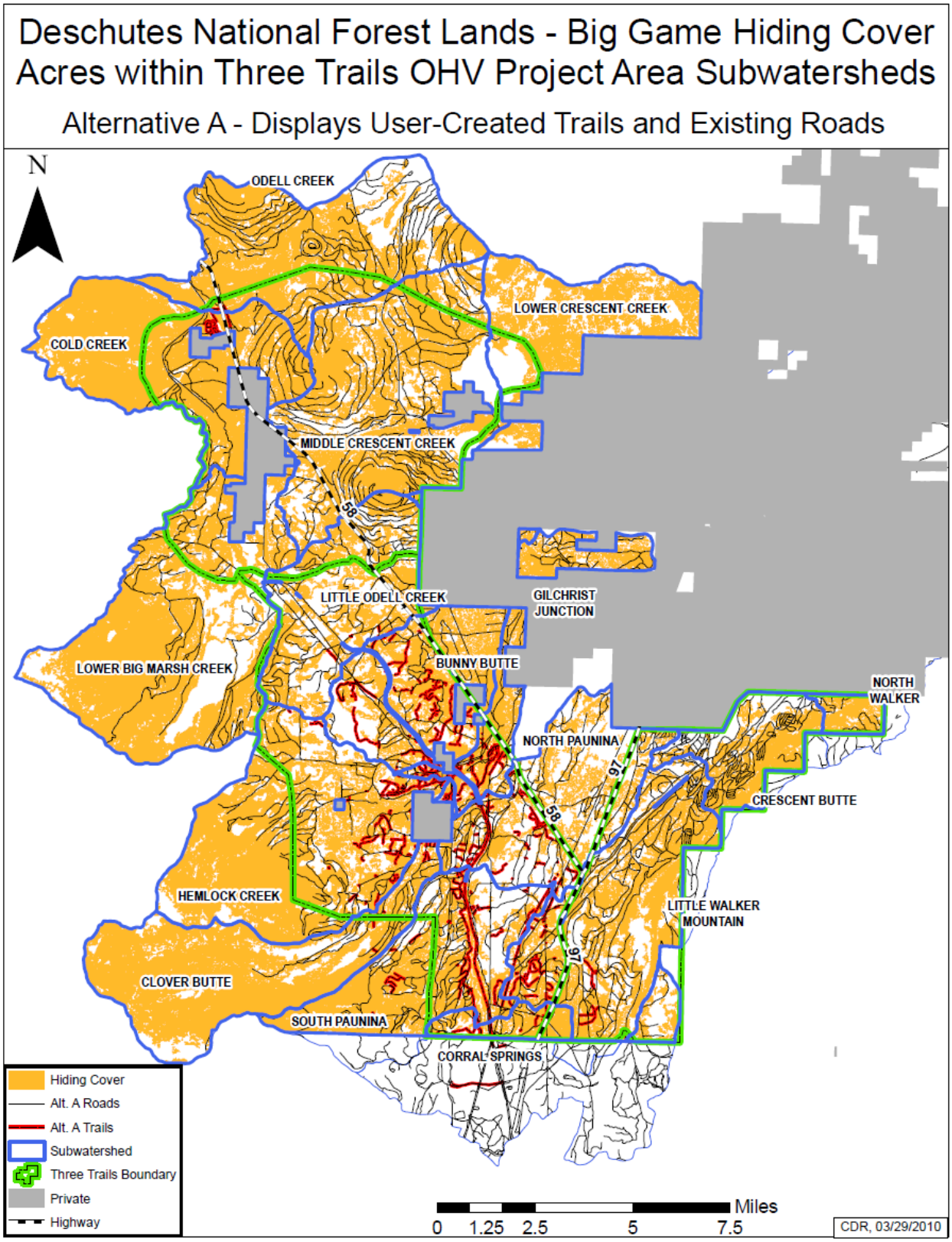


**Figure 25. Big Game Hiding Cover**

## Analysis of Effects to Big Game Habitat

*Key Indicators for Big Game Habitat*
Effects to big game will be displayed at several scales including 6-field subwatersheds and the entire Three Trails OHV project area. The following indicators will be used to compare the effects of alternatives to big game:

- *Open road density available for motorized use within 6$^{th}$-field subwatersheds expressed in miles of road per square mile of National Forest System roads.*
- *Open road and trails available for motorized use within 6th field subwatersheds expressed in miles of route per square mile of National Forest System roads and trails.*
- *Number of 6$^{th}$-field subwatersheds with a density of greater than 2.5 miles of National Forest System* ***roads*** *open for motorized use.*
- *Number of 6$^{th}$-field subwatersheds with a density of greater than 2.5 miles of National Forest System* ***roads and trails*** *open for motorized use.*
- *Acres of Deschutes National Forest land greater than 1 mile from an open motorized route in the project area.*
- *Acres of Deschutes National Forest land greater than ½ mile from an open motorized route and percent of the project area.*
- *Acres of Deschutes National Forest land less than 660 feet from an open motorized route and percent of the project area.*
- *Acres and percent of the Deschutes National Forest land providing hiding cover less than 660 feet from an open motorized route.*
- *Number of 250 acre or greater blocks of elk security cover in the project area.*

Table 81 displays a summarization of the predicted effects of the proposed action and alternatives on big game.

**Table 81. Comparison of Key Indicators for Big Game by Alternative**

| Key Indicators | Alternative | | | | |
|---|---|---|---|---|---|
| | A | B | C | D | E |
| Description of the trail system (dense trail loop design versus a more open and widely spaced loop system) | No change in current use | Dense loops | Open loops | Dense loops | Dense and open loops |
| National Forest road only density in mi/square miles averaged across 16 subwatersheds[47] | 3.8 | 2.2 | 1.9 | 1.9 | 2.0 |
| National Forest road and motorized trail density in mi/square mile averaged across 16 subwatersheds | 4.3 | 2.8 | 2.5 | 2.5 | 2.5 |
| Number of 6th-field subwatersheds with >2.5 miles of roads open for motorized use | 13 | 8 | 6 | 5 | 6 |
| Number of 6th-field subwatersheds with >2.5 miles of roads and trails open for motorized use | 13 | 10 | 9 | 8 | 8 |
| Acres of National Forest land > than 1 mile from an open motorized route in the project area | 0 | 0 | 0 | 0 | 0 |
| Acres of National Forest land > than 1/2 mile from an open motorized route and percent of total project area | 802 (1%) | 3,913 (4.2%) | 3,541 (3.8%) | 4,527 (4.9%) | 4,329 (4.7%) |
| Acres of National Forest land < than 660 feet from an open motorized route and percent of project area | 77,430 (83%) | 51,310 (55%) | 56,538 (61%) | 53,348 (57%) | 54,045 (58%) |
| Acres and percent of National Forest land providing hiding cover <660 feet from an open motorized route | 49,655 (64%) | 35,232 (69%) | 35,732 (63%) | 33,894 (64%) | 34,221 (63%) |
| Number of 250 acre elk security cover blocks in the project area | 1 | 8 | 7 | 8 | 8 |

[47] Total of 16 subwatersheds within the Three Trails OHV analysis area that equals 161,993 acres of National Forest

***Effects of Motorized Vehicle Access to Big Game***

Effects to deer and elk habitat from motor vehicle access can be discussed in terms of direct and indirect impacts from disturbance, off-road recreation impacts, and increased legal and illegal harvest. The 1990 Forest Plan recognized a need to limit motor vehicle access and set guidelines on target road densities for deer winter range, deer summer range, and key elk areas described earlier. At the time it was drafted, no guidelines were in place to account for off-highway vehicle use. Consequently, motorized densities were based on passenger cars, two wheel and four-wheel drive trucks. Since then, off-highway vehicle use has increased greatly and has a considerable contribution to the amount of motorized vehicle use across the Deschutes National Forest, including the Three Trails OHV project area. Public scoping letters and participation in public meetings conducted for this project indicate many users tend to prefer driving closed roads because of the reduced traffic levels.

*Disturbance*

Stankowich (2008) conducted a comprehensive review and meta-analysis of research on ungulate escape responses from human and vehicle disturbances. His review found evidence that ungulates pay attention to approacher behavior, have greater perceptions of risk when disturbed in open habitats, and that females or groups with young offspring show greater flight responses than adult groups. He also found that humans on foot were more evocative than other stimuli (vehicles, noises) and that hunted populations showed significantly greater flight responses than non-hunted populations.

A key element of elk habitat management is providing hiding cover and security areas especially during the fall hunting seasons. Some studies have shown that elk, when disturbed by motor vehicles, will leave an area that lacks sufficient hiding cover (Hillis et al. 1991 and Wisdom et al. 2004). Hillis et al. (1991) defined elk security cover as forested habitat at least 250 acres in size and at least ½ mile from a road open to motorized travel. Recent studies at the Starkey Project in northeast Oregon (Wisdom et al. 2005) have disclosed even more information on the effects of roads and road densities on deer and elk. Rowland et al. (2000) summarized the direct impacts of roads and associated traffic on elk, in addition to outright mortality from vehicular collisions as follows: (1) Elk avoid areas near open roads but it varies in response to traffic rates; (2) Elk vulnerability to mortality from hunter harvest, both legal and illegal, increases as open road density increases; and (3) In areas of higher road density, elk exhibit higher levels of stress and increased movement rates. Rowland et al. (2005) also noted that elk use increased as distance from open roads increased and suggested that judicious closing of certain road segments, particularly road spurs, may retain or create blocks of habitat that serve as security areas for elk while allowing sufficient road access for other management needs.

Disturbance impacts to mule deer from off-road use (including motorized) is more difficult to quantify. Mule deer studies from the Starkey Project in northeastern Oregon showed little measureable response to off-road treatments (ATV riding, mountain biking, hiking, and horseback use) as compared to control periods of no activity reported by Wisdom et al. (2004). Mule deer movement rates increased only slightly however, during periods of all four off-road activities except ATV riding. Estimated probabilities of mule deer flight response were similar among all four activities versus control periods. This suggested that deer were not exhibiting the same tendency for flight as shown by elk in relation to off-road activities. However, Wisdom et al. (2004) also reported that deer may be responding to fine-scale changes in habitat use, rather than substantial increases in movement rates and flight responses. For example, it is possible that deer may respond to an off-road activity by seeking dense cover rather than running from the activity. This could lead to animals spending more time in dense cover and less foraging may occur resulting in less fat reserves needed for winter survival. Wisdom et al. (2004) also used only one to three ATV riders for their study design which is much less than is currently occurring in the Three Trails OHV project area and what is likely to occur with full implementation of an action alternative. Consequently, the conclusions of Wisdom et al. (2004) of mule deer having little measurable

response to ATV use may not be applicable to the Three Trails OHV project area and mule deer may exhibit entirely different behaviors.

Studies by Stankowich (2008) showed that humans on foot have more impact on mule deer than other stimuli studied (vehicles, noise, and horseback). Ferris and Kutilek (1989 in Joslin and Youmans 1999) found black-tailed deer avoided OHV areas during high peak use but returned to established home ranges after traffic levels subsided.

In another study Yarmoloy (1988 in Ouren et al. 2007) studied mule deer does equipped with radio collars and several were intentionally followed by ATVs for nine minutes a day for 15 days. The harassed does shifted their feeding patterns into darkness, used cover more frequently, and increased their flight distance from ATVs. The harassed does also showed reduced reproduction successes the following year as compared to the control does that were not harassed. These effects would not be expected to occur in most of the project area because of dense understory of lodgepole pine inhibiting off-road travel and because off-road travel would not be permitted (Project Design Features, Chapter 2).

Hayden et al. (2008) stated that disturbance factors in and of themselves have generally not been implicated in lower mule deer population performance. However, given the nutritional and energy requirements of deer, it seems reasonable to assume such factors could work insidiously with a number of other factors to negatively impact deer. *Habitat Guidelines for Mule Deer in the Northern Forest Ecoregion* (Hayden et al. 2008) provided a list of recommendations to minimize negative effects of human encroachment. Those applicable to the Three Trails OHV project include:

- Develop consistent regulations for OHV use.
- Develop and maintain interagency coordination in enforcement of OHV regulations.
- Designate specific areas and times (seasonal use restrictions) for activities such as OHV use that disturb habitat or deer.
- Cluster recreational activities to maintain or create large blocks of undisturbed habitat. Direct new development toward previously disturbed areas (clumped rather than dispersed distribution).
- Seasonally separate humans and mule deer at critical periods.
- Through education, modify human behaviors to reduce recreational effects in mule deer.
- Monitor activities that may unduly stress deer at important times of the year. Reduce or regulate disturbance if deemed detrimental. When applicable, encourage enforcement of regulations regarding dogs running at large or chasing wildlife and wildlife harassment by snowmobiles and OHVs.

At the present time, motorized road use in the OHV analysis area could be described as low to moderate during most of the year. Typically, most roads begin to melt out from winter snow in April and motorized use is available until November depending on snowfall timing and depth. During the spring and summer, road use is generally light including lands east of Highway 97 except near dispersed campsites along the Little Deschutes River, and where personal use firewood cutting is permitted. The general exceptions are roads and user-created OHV trails near population centers such as Crescent Lake Junction and several housing subdivisions which see substantial use during all periods roads and trails are snow-free. However, motorized use in the entire project area changes dramatically beginning in late August with the onset of archery hunting season. This is followed by the opening of the matsutake mushroom season in early September with several thousand harvesters in the woods including the OHV analysis area. The rifle deer season starts in late September or early October and is followed by rifle elk season in mid-October. Usually in early November, the personal use firewood permittees and the mushroom harvesters shut down because of the end of the season and/or snowfall closes access.

*Off-Road Recreation Effects*

The amount of habitat affected by OHVs, 4-wheel drive vehicles, and random cross-country travel is difficult to quantify. A series of public meetings for this project were held and OHV users were asked where they traveled on the district. Of concern was the number of user-created trails including a number of trails originating from the Two Rivers North subdivision. The public also stated they preferred to ride on closed roads (Level 1 and no maintenance) which may or may not have been physically closed or signed as closed to motorized use. The reasoning was because of less motorized traffic on the roads. Based on these public comments, it was assumed for the purposes of this analysis, all roads and user-created trails were being used by OHV users. It is unlikely all motorized trails have been located. Consequently, the amount of habitat being disturbed by motorized travel is only estimated. Field going personnel from the district estimate a weekday average of 25-50 OHV riders within each of the three project areas (Junction, Rivers, and Walker). Weekend observations provided by Forest Service law enforcement officers and estimates by the users themselves determined 100 riders each day in the Junction and Rivers areas and 50 riders in the Walker use area. Law enforcement officers also indicate that during summer holiday weekends, the daily number of riders can double in each of the three areas. To assess the amount of big game habitat affected from motorized disturbance, a distance banding analysis was completed showing acreage within 660 feet from open roads or motorized trails, acres greater than ½ mile from an open road or motorized trail, and acres greater than one mile from an open road or motorized trail. Rowland et al. (2000) study at Starkey showed that elk response to open roads diminish markedly at a distance of 1,969 yards (1.1 miles).

The only studies at this time that have examined elk response to modes of off-road recreation were done at Starkey in northeastern Oregon (Wisdom et al. 2004; Naylor et al. 2009). Wisdom et al. (2004) measured responses by mule deer and elk to four off-road recreation activities including hiking, mountain biking, horse riding, and ATV riding. The distance deer and elk moved and movement rates were measured in response to the activity and during control periods where no recreational activity was permitted. Mule deer responses contrasted sharply with elk. Mule deer showed little measureable response to the off-road treatments although movement rates increased slightly however, during periods of all four off-road activities except ATV riding. Wisdom hypothesized that deer may be responding to the treatments with fine-scale changes in habitat use, rather than substantial increases in movement rates and flight responses.

However, Wisdom et al. (2004) cautioned against inferring their study results to other areas where mule deer are common and elk are absent or sparse, would be inappropriate and likely unreliable. In the absence of moderate or high densities of elk, mule deer may exhibit different distribution and selection patterns in relation to roads and traffic. Within the Three Trails OHV analysis area, elk densities would be described as ‘low’ with mule deer being much more common than elk. In the absence of mule deer research with ATV densities similar to that in the Three Trails OHV project area, the presence of hiding cover away from motorized routes may be very important to mule deer.

Movement rates by elk increased substantially during off-road activities as compared to the control periods (Wisdom et al. 2004 and Naylor et al. 2009). ATV use showed the greatest response by elk resulting in the greatest increase in movement, distance moved, and probability of flight response. The study suggests that elk were displaced from preferred security and foraging areas as a result of flight behavior during the daytime off-road activities. ATV riding and mountain biking caused the largest reductions in elk feeding time and increases in elk travel time and elk showed no habituation to mountain biking (Naylor et al. (2009). Preisler et al. (2006) in an elk study of elk and ATV use at Starkey found that elk appeared to respond at long distances (greater than 1,000 meters) to ATVs and that the estimated probability of flight appeared to be higher when elk were closer to ATV routes, even when the distance to the ATV was large. His study noted that a significant number of elk appear to ‘freeze’ while the ATVs pass very close (50-100 meters) that seem to suggest the possibility that elk are using topography and

vegetation to escape detection at close distances to roads. Preisler et al. (2006) also concluded that over successive days of treatments (ATV riders) elk appear to adjust their distribution so that they are located closer to areas that are not visible from roads and during the nine days of rest in-between treatments, the animals appeared to return to their pretreatment distributions.

*Effects from Legal and Illegal Harvest*

Roads open for motorized use provide the predominant hunter access into the three big game management units (Paulina, Ft. Rock, and Upper Deschutes). As shown in Table 82, current road densities in the subwatersheds range from 1.4 mile per square mile to 9.3 miles per square mile. The greater the motorized route density the greater the potential for game violations. Road hunting in itself is not considered illegal by the State of Oregon as long as the driver steps away from the road surface to fire the weapon. However, shooting from the road surface is a common occurrence as well as shooting from inside motor vehicles and having loaded weapons in the vehicle. All are not permitted by law. High open road and/or motorized trail densities also provide easy access for poaching of big game animals. Poaching is considered one of the factors contributing to the general decline in mule deer numbers in central Oregon.

In addition to big game mortality from motorized access, there can be costs to deer and elk. Johnson et al. (2004 in Wisdom et al. 2005) stated that elk trying to elude hunters can deplete fat reserves needed for over-winter survival and that elk responded to hunters by fleeing disturbances, whereas deer appear to elude hunters by hiding. Cook et al. (1996, 2005) reported that forage intake and nutritional quality during August and September can be determinants of winter survival of elk calves. Cook et al. (2005) also reported that the effects of the summer-autumn nutrition on fat accretion of cows and growth of calves significantly influenced their survival probability under harsh winter conditions. These months coincide with archery elk seasons and also when other recreationists such as mushroom harvesters take to the woods. Time spent hiding from people takes away from foraging. While Rowland et al. (2000, 2004) found elk showed increasingly strong selection toward areas with increasing distance from roads open to motorized traffic, some recreationists (hunters and mushroom harvesters) would travel on foot that distance to pursue their activity. The research at Starkey also indicated that mule deer moved closer to roads with the assumption that they changed their distribution within the study area in relation to opposite changes in distribution by elk. This could lead to higher levels of deer harvest where road densities are also high. However, Wisdom cautioned against inferring their results to other areas where mule deer are common and elk are absent or sparse, as this would be inappropriate and likely unreliable. In the absence of moderate or high densities of elk, mule deer may exhibit different distribution and selection patterns in relation to roads and traffic. Within the Three Trails OHV analysis area, mule deer are much more common than elk and it is unknown if deer are purposely selecting habitats near roads and trails or if the opposite is true.

Road density and the distributional pattern of open roads and motorized trails are important in determining the security an area can provide elk during hunting seasons. Where possible, clumping road/trail closures can maintain security areas which Hillis et al. (1991) has described as a non-linear patch greater than 250 acres in size and greater than ½ mile from an open motorized route. The effects discussion on alternatives provide analysis conducted at several distance banding scales to determine the relative amounts of security habitat for big game.

*Executive Order 13443*

Executive Order 13443 was signed by President Bush on August 13, 2007 and is intended to enhance hunting opportunities on federal public lands. The stated purpose of the Executive Order is to "…direct federal agencies that have programs and activities that have a measureable effect on public land management, outdoor recreation, and wildlife management, including the department of the Interior and

the Department of Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitats."

Maintaining motorized access is probably one of the most frequently expressed comments the Crescent District and Deschutes National Forest receives during requests for public input. While open roads increase access for recreational activities (including hunting), it comes at a cost to some wildlife species. Roads and access lessen the amount of security habitats for big game and increase the amount of land base subject to motorized disturbance. Roads also increase hunter opportunity, may or may not reduce conflicts between user groups such as mushroom harvests and hunters, and increase the potential for poaching and unethical behavior. The key is to find a balance on providing a level of motorized access for all recreational users and undisturbed habitats for those species more susceptible to motorized disturbance.

The following two tables display road densities and combined road and trail densities by subwatershed by alternative. Alternative A for each table assumes all roads are open whether or not road blocks, debris placement, or signing has been placed at road entrances per signed NEPA decisions. This assumption is used because OHV users on the district have stated they tend to prefer driving on closed road systems because of lower traffic levels.

Table 82 displays road densities in the Three Trails OHV analysis area expressed in miles of road per square mile of land base on National Forest System land within each subwatershed. Any portion of a subwatershed that overlapped with the Three Trails OHV project area has been included which results in a total of 161,993 acres analyzed for motorized densities even though the actual project area is 93,016 acres.

**Table 82. Total Combined Motorized Density of Roads Only Expressed in Miles per Square Mile of Land by Alternative and Subwatershed (Deschutes National Forest System lands only)**

| 6th Field Subwatershed | 6th Field Acres Deschutes National Forest System Lands Only | Alt. A Total Motorized Density Roads Only mi/mi[248] | Alt. B Total Motorized Density Roads Only mi/mi$^2$ | Alt. C Total Motorized Density Roads Only mi/mi$^2$ | Alt. D Total Motorized Density Roads Only mi/mi$^2$ | Alt. E Total Motorized Density Roads Only mi/mi$^2$ |
|---|---|---|---|---|---|---|
| Cold Creek | 11,819 | 1.8 | 1.2 | 1.1 | 1.1 | 1.1 |
| Lower Big Marsh Creek | 18,642 | 2.3 | 1.3 | 1.0 | 1.0 | 1.0 |
| Middle Crescent Creek | 16,970 | 4.1 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lower Crescent Creek | 8,371 | 4.3 | 3.2 | 3.2 | 3.2 | 3.2 |
| Corral Springs | 2,637 | 4.1 | 2.7 | 2.0 | 1.9 | 2.0 |
| Crescent Butte | 4,534 | 9.3 | 7.0 | 3.0 | 3.5 | 3.0 |
| Little Walker Mountain | 12,598 | 5.6 | 3.0 | 2.3 | 2.3 | 2.3 |
| North Paunina | 10,214 | 4.4 | 2.1 | 2.1 | 2.0 | 2.2 |
| North Walker | 1,061 | 4.4 | 2.8 | 0.8 | 1.5 | 0.8 |
| South Paunina | 9,671 | 4.2 | 3.2 | 2.6 | 2.5 | 2.6 |
| Bunny Butte | 8,517 | 3.8 | 2.9 | 2.7 | 2.7 | 2.7 |
| Clover Butte | 12,223 | 1.4 | 1.1 | 0.7 | 0.7 | 0.7 |
| Gilchrist Junction | 4,659 | 5.0 | 1.7 | 4.4 | 4.4 | 4.4 |

[48] Alternative A includes Maintenance Level 1 roads in the total density

| 6th Field Subwatershed | 6th Field Acres Deschutes National Forest System Lands Only | Alt. A Total Motorized Density Roads Only mi/mi[248] | Alt. B Total Motorized Density Roads Only mi/mi$^2$ | Alt. C Total Motorized Density Roads Only mi/mi$^2$ | Alt. D Total Motorized Density Roads Only mi/mi$^2$ | Alt. E Total Motorized Density Roads Only mi/mi$^2$ |
|---|---|---|---|---|---|---|
| Hemlock Creek | 16,867 | 2.8 | 1.4 | 1.5 | 1.3 | 1.5 |
| Little Odell Creek | 9,349 | 5.1 | 2.9 | 2.7 | 2.7 | 2.7 |
| Odell Creek | 13,839 | 4.3 | 1.8 | 1.8 | 1.8 | 1.8 |
| **Total** | **161,993** | **3.8** | **2.2** | **1.9** | **1.9** | **2.0** |

**Table 83. Total Combined Open Motorized Density of Roads and Trails Expressed in Miles per Square Mile, Alternative, and Subwatershed (Deschutes National Forest System lands only)**

| 6th Field Subwatershed | 6th Field Acres National Forest System Lands Only | Alt. A Total Motorized Density (Roads + Trails) mi/mi[249] | Alt. B Total Motorized Density (Roads + Trails) mi/mi$^2$ | Alt. C Total Motorized Density (Roads + Trails) mi/mi$^2$ | Alt. D Total Motorized Density (Roads + Trails) mi/mi$^2$ | Alt. E Total Motorized Density (Roads + Trails) mi/mi$^2$ |
|---|---|---|---|---|---|---|
| Cold Creek | 11,819 | 2.0 | 2.4 | 1.8 | 1.7 | 1.7 |
| Lower Big Marsh Creek | 18,642 | 2.3 | 1.3 | 1.1 | 1.1 | 1.1 |
| Middle Crescent Creek | 16,970 | 4.1 | 2.0 | 2.2 | 2.0 | 2.1 |
| Lower Crescent Creek | 8,371 | 4.3 | 3.2 | 3.8 | 3.2 | 3.9 |
| Corral Springs | 2,637 | 6.6 | 3.0 | 2.8 | 3.9 | 3.8 |
| Crescent Butte | 4,534 | 9.3 | 7.0 | 4.2 | 3.5 | 3.0 |
| Little Walker Mountain | 12,598 | 6.3 | 4.5 | 3.8 | 4.1 | 4.0 |
| North Paunina | 10,214 | 5.7 | 5.3 | 3.3 | 2.2 | 2.4 |
| North Walker | 1,061 | 4.4 | 2.8 | 0.8 | 1.5 | 0.8 |
| South Paunina | 9,671 | 5.6 | 4.7 | 3.2 | 4.4 | 4.1 |
| Bunny Butte | 8,517 | 5.5 | 2.9 | 4.1 | 4.7 | 4.0 |
| Clover Butte | 12,223 | 1.7 | 1.2 | 0.8 | 0.7 | 0.7 |
| Gilchrist Junction | 4,658 | 7.5 | 3.1 | 5.3 | 4.7 | 4.7 |
| Hemlock Creek | 16,867 | 3.3 | 2.3 | 1.8 | 1.3 | 2.0 |
| Little Odell Creek | 9,349 | 5.2 | 2.9 | 3.8 | 4.9 | 3.5 |
| Odell Creek | 13,838 | 4.3 | 1.8 | 1.9 | 1.9 | 1.9 |
| **Total** | **161,993** | **4.3** | **2.8** | **2.5** | **2.5** | **2.5** |

## Environmental Consequences

### *Direct and Indirect Effects on Big Game Habitat*

### Alternative A

Alternative A would retain the current pattern of disturbance from unregulated cross-country motor vehicle access, user-created trails, and use of roads that were intended for closure under previous NEPA decisions to meet forest plan standards and guidelines. There are no National Forest System lands greater than one mile from an open motorized route in the project area resulting in no high quality security cover particularly for elk.

[49] Alternative A includes all Maintenance Level 1 roads in the total density

*Disturbance*
This alternative provides the poorest distribution of security habitat for deer and elk based on the current configuration of roads and motorized trails users have reported using and on the distance band analysis shown in Table 81. There would be no opportunity to close roads, designate a defined OHV trail system or rehabilitate user-created trails. Open road densities on National Forest system lands only would remain at 3.8 mi/mi$^2$ and roads and trails combined would stay at an existing level of 4.3 mi/mi$^2$ on National Forest system lands only averaged across all 16 subwatersheds. Road densities would exceed Forest Plan guidelines of 2.5 mi/mi$^2$ in 13 of the 16 subwatersheds.

Distance banding analysis showed there are only 802 acres of National Forest lands greater than 1/2 mile from an existing road or motorized trail which represents approximately one percent of the land base in the project area. This block is located near Black Rock Pit most of which is a lava formation and used as a quarry although limited forested cover is present in the eastern portion of block. In addition, 77,430 acres (83 percent) of the project area is within 660 feet of an existing road or motorized trail and approximately 64 percent of the acreage within 660 of a road or trail currently provides hiding cover. There is also only one security cover block in the entire project area greater than 250 acres that Hillis et al. (1991) described as capable of providing security cover. This analysis concludes that elk would continue to experience high levels of disturbance from motorized use. For mule deer, the 64 percent of the land base within 660 feet of a road or motorized trail would provide some level of hiding cover and may partially mitigate the impact of a high road and trail density. It is assumed that lands within the 660 foot zone are unavailable for consistent elk use as cover or foraging areas at least during daylight hours when motorized traffic is more likely to occur.

Table 84 displays the number of elk security cover blocks that are greater than 250 acres in size in the project area by alternative.

**Table 84. Number of Elk Security Cover Blocks Greater Than 250 Acres In Size**

| Alternative A | Alternative B | Alternative C | Alternative D | Alternative E |
|---|---|---|---|---|
| 1 | 8 | 7 | 8 | 8 |

*Off-road Motor Vehicle Access*
Unregulated motorized access from all user groups would continue to degrade big game habitats. This would result from unregulated access into deer hiding cover patches, elk security cover blocks, and into calving and fawning grounds during critical time periods of May and June. It is also reasonable to assume user-created trails could continue to increase in mileage and further expand across the analysis area although the rate of increase is unknown.

*Executive Order 13443*
There would be no loss of hunting acreage or motorized access within National Forest System lands in the analysis area. However, the proportion of the hunting public that prefers a less motorized landscape for their hunting experience would likely have a decreasing degree of satisfaction. Conversely, those hunters seeking areas with a high degree of motorized use would continue to benefit from a general lack of regulated access. Legal and illegal harvest of deer and elk would be expected to continue at the same rate or slightly increasing as more user-created motorized routes are established though also subject to other factors negatively affecting big game populations.

*Key Elk Habitats*
There would be no reduction in the amount or distribution of user-created motorized trails and existing roads within riparian and uplands habitats of Key Elk areas (KEAs) and other riparian systems within the analysis area. Negative impacts including disturbance during calving seasons would be expected to

continue resulting in animal harassment. Security cover blocks greater than 250 acres in size would not be available to herds of elk. Existing road densities within the Hemlock KEA would remain well above the Forest Plan guideline level of 0.5 to 1.5 mi/mi$^2$. There would also be no opportunity to re-configure the Hemlock KEA boundary to reduce road densities, increase security habitat acreage and include more wet meadow habitats for elk calving. There would be no change in the road density level in the Maklaks KEA which is 0.83 mi/mi$^2$ and within Forest Plan guidelines.

Table 85 displays the current and expected change in road densities by alternative within each Key Elk Area. A Deschutes National Forest Plan Amendment is also proposed that would adjust the current configuration of the Hemlock KEA. With the amendment only the boundary would change while the designated acreage and general location would remain the same. The result is a lowered road density in all action alternatives and incorporation of greater wet meadow habitat than the current boundaries provide.

**Table 85. Open Motorized Route Densities (Roads and Trails) Within Key Elk Areas (Alternatives B-E assume a similar re-configuration of the Hemlock Key Elk boundary)**

| Key Elk Area | Alternative A | Alternative B | Alternative C | Alternative D | Alternative E |
|---|---|---|---|---|---|
| Hemlock 2,511 acres | 3.4 mi/mi$^2$ | 0.7 mi/mi$^2$ | 0.7mi/mi$^2$ | 0.7 mi/mi$^2$ | 0.7 mi/mi$^2$ |
| Maklaks 1,616 acres | 0.8 mi/mi$^2$ | 0.8 mi/mi$^2$ | 0.8 mi/mi$^2$ | 0.8 mi/mi$^2$ | 0.8 mi/mi$^2$ |

**Effects Common to All Action Alternatives**

As in Alternative A, although each action alternative has a range of reduced road densities through road closure, there remains no National Forest System land greater than one mile from an open motorized route in the project area resulting in no high quality security cover particularly for elk.

*Off-road Motor Vehicle Access*

Unregulated cross-country motorized travel including user-created trails across the analysis area would be prohibited with Alternatives B, C, D, and E. Motorized use would be restricted to the designated OHV trail system and those Maintenance Level 2 roads open for vehicular travel. This would result in less motorized disturbance to big game animals compared to Alternative A because roads and trails open for use are reduced across the project area. Law enforcement actions would likely encourage compliance through education in the first couple years although it is unknown what level of non-compliance may occur initially. However, over the last five years the Deschutes Forest Service Law Enforcement "incidents" or law enforcement actions (total 116) with OHVs showed the majority of the actions taken were for no stickers, helmets, or lack of safety training and only 10 actions were for noise. There were also four notices of violation or warnings issued for resource damage (Reed pers. comm. 2009).

*Executive Order 13443*

There would be no removal of lands within the National Forest System of the project area available for hunting in Alternatives B, C, D, and E. However, each of the action alternatives proposes a mix of road closures, roads converted to motorized trails, closure/rehabilitation of some user-created trails, and construction of new trails to provide a designated OHV trail system. This would reduce motorized access for hunting purposes to the density levels proposed in each subwatershed by alternative as displayed in Table 82 and Table 83. Some subwatersheds would experience an increased level of motorized access and some subwatersheds would experience lower densities depending on road closures and where new and/or existing trails become part of the designated system. Averaged across the entire 16 subwatersheds motorized densities would be lower as compared to Alternative A. Hunters with trucks and four-wheel drive vehicles would experience less access as a result of the road closures although the OHV users would still be able to access big game habitats with their OHVs on designated trails. There is no provision

however, for the retrieval of game with OHVs off designated trail systems. Conversely, those hunters seeking a hunting experience with less motorized use may find additional suitable areas in the Three Trails OHV project area. Because motorized densities decrease compared to Alternative A there may be a decrease in legal and illegal harvest of deer and elk although as previously mentioned other factors are also negatively affecting big game populations.

**Alternative B**

The selection of Alternative B would eliminate the current pattern of disturbance from unregulated cross-country motor vehicle travel (proposed action). In its place a regulated trail network providing approximately 123 total miles of motorized trails and nine miles of roads converted to trails for a total of 132 miles in the designated trail system. The trail systems would be linked with shared use roads, railroad crossings and an underpass on Highway 97 south of the junction with Highway 58. Generally, roads and trails are clustered into high density areas near Crescent Lake Junction Sno-Park, north and east of Two Rivers North subdivision and west of Walker Mountain. Approximately 56 miles of user-created trails would be closed/rehabilitated and 41 miles of existing roads closed to motorized use to balance the increase in designated trails. This proposal would also construct four staging areas two to five acres in size to provide for parking, camping, toilets, learner loops, picnic tables, and fire rings. There would be one staging area within the Junction area, two in the Rivers subunit and one in the Walker subunit. It is also projected that motorized use would increase approximately 2.5 to 5.6 percent per year as the OHV trail system develops and becomes more widely known to users.

*Disturbance*

Alternative B would result in a much improved distribution of undisturbed hiding and security cover habitat for deer and elk compared to Alternative A. Open road densities on National Forest system lands only would drop from a current 3.8 mi/mi$^2$ to 2.2 mi/mi$^2$ and road and motorized trail densities combined would also drop from an existing 4.3 mi/mi$^2$ to 2.8 mi/mi$^2$ on National Forest system lands averaged across the 16 subwatersheds. Road densities would exceed Forest Plan guidelines of 2.5 mi/mi$^2$ in eight of the 16 subwatersheds and combined road and motorized trails would exceed 2.5 mi/mi$^2$ in ten of the 16 subwatersheds.

Alternative B distance banding analysis showed there is no National Forest System land greater than one mile from an open motorized route in the project area resulting in no high quality security cover particularly for elk. There is however, approximately 3,913 acres (4.2 percent) of the project area of National Forest lands greater than ½ mile from open motorized route and represents the third highest level of the action alternatives. Patch sizes range from eight to 1,088 acres and are generally distributed across the entire 93,016 acre project area. Road closures and designation of an established motorized route available for use result in the increase in lands greater than ½ mile from a route. In addition, 51,310 acres (55 percent) of the project area is within 660 feet of an existing road or motorized trail and approximately 69 percent of the acreage within 660 of a road or trail currently provides hiding cover. Alternative B has the fewest acres of all alternatives within 660 feet of a motorized route because of road closures and a more densely packed trail design which impacts fewer acres of big game habitat. This alternative would also provide a total of eight security cover blocks greater than 250 acres in size located on Royce Mountain (1,088 acres), Spruce/Swamp Creeks (287 acres), Black Rock pit (250 acres), and the north end of Walker Rim (507 acres) that would benefit deer and elk. This alternative would benefit elk to a greater degree than Alternative A because of the road closures and dense trail loop design although likely be limited to the elk utilizing the Hemlock KEA and near Royce Mountain because of the undisturbed blocks greater than 250 acres in size. Smaller blocks are available in the Junction, Crescent Creek and Bunny Butte areas, but they are less than 250 acres in size and do not provide the same security cover advantages present in larger blocks.

East of Highway 97 the only designated trail system would be placed near Little Walker Mountain. This strategy would not create additional motorized disturbance in a zone where mule deer are known to migrate around the north end of Walker Mountain and then cross Highway 97 to summer ranges even further west. This strategy is essentially the same in Alternatives B, D, and E. Overall, the trail system proposed would provide benefits to deer and elk compared to the existing condition because of an overall reduced open route density resulting in more undisturbed habitat that is greater than 660 feet and ½ mile from a motorized route. Because of the road closures and where existing hiding cover is present, the amount of hiding cover within 660 feet either side of an open route is improved to 69 percent compared to 64 percent in Alternative A. This is likely more beneficial to deer than elk. It is assumed that lands within the 660 foot zone are unavailable for consistent elk use as cover or foraging areas at least during daylight hours when motorized traffic is more likely to occur. The Alternative B trail design with dense loop trails is consistent with recommendations from Hayden et al. (2008) to cluster recreational activities to maintain or create large blocks of undisturbed habitat and direct new development toward previously disturbed areas.

Project Design Features and mitigation measures specified in Chapter 2 would result in reduced impacts to big game as compared to Alternative A. The Green Dot Road Closure Order would remain in effect during the two week modern rifle deer season and restrict OHV users to open roads only. Motorized trails would be designed away from existing hiding cover patches which would benefit deer although less so for elk. An underpass is proposed for Highway 97 near the Highway 58 junction to allow OHV passage for trail access on either side of Highway 97. The underpass would be designed to be wildlife friendly and allow deer and bear sized animals and smaller to cross. It would result in less animal mortality on Highway 97 and is proposed for Alternatives B, C, D, and E. A new water guzzler is also proposed to compensate for possible reduction in use of an existing guzzler near Little Walker Mountain as a result of motorized routes nearby. The new guzzler would be placed further north and east of Walker Mountain on road 9755190 and is proposed for Alternatives B, C, D, and E. It is expected that construction of the new guzzler would take approximately five work days. Work needs include excavation of a shallow pit about four feet deep and length and width dimensions of about 25 feet by 15 feet for the placement of the fiberglass tanks and then the pit would be filled with dirt. Some limited clearing of small trees and brush may also be needed for the placement of the metal apron for water collection with dimensions similar to the pit. Overall, guzzler construction would have a negligible disturbance impact on wildlife because of the short time-frame needed for project completion and have long-term benefits to all wildlife species by providing water where it is currently very limited.

*Key Elk Habitats*

The Hemlock Key Elk Area (KEA) would be re-configured to include more wet meadow habitat although the total acres would remain the same. The benefits to elk include reduced motorized route densities across the KEA from 3.4 mi/mi$^2$ in Alternative A to 0.7 mi/mi$^2$ in Alternative B. Within the Hemlock KEA there would also be an increase in security cover greater than 1/2 mile from an open route from zero acres in Alternative A to 287 acres in Alternative B. Collectively these measures would allow greater use of the Hemlock KEA for calving, foraging, and hiding/thermal and security cover needs free of motorized disturbance. There would be no change in motorized route densities within the Maklaks KEA.

**Alternative C**

The selection of Alternative C would eliminate the current pattern of disturbance from unregulated cross-country motor vehicle travel. This alternative focuses on the response from riders for longer loops, scenic vistas or water destinations, access to goods and services, retention of Muttonchop Pit and interconnection of loops. The trails are generally spaced further apart than proposed in Alternative B and could be described as an open loop system as compared to Alternative B. The selection of Alternative C would provide approximately 100 miles of motorized trails and 53 miles of roads converted to trails for a total of 153 miles in the trail system. This alternative would also result in the closure/rehabilitation of 90 miles of

user-created trails and 108 miles of roads closed to motorized use to balance the increase in designated trails. This proposal would also construct four staging areas two to five acres in size to provide for parking, camping, toilets, learner loops, picnic tables, and fire rings. There would be one staging area within the Junction subunit, three in the Rivers subunit and two in the Walker subunit. It is projected that motorized use would increase approximately 2.5 to 5.6 percent per year as the OHV trail system develops and becomes more widely known.

*Disturbance*

Alternative C would result in a much improved distribution of undisturbed hiding and security cover habitat for deer and elk compared to Alternative A. Open road densities on National Forest system lands only would drop from a current 3.8 mi/mi$^2$ to 1.9 mi/mi$^2$ and road and motorized trail densities combined would also drop from an existing 4.3 mi/mi$^2$ to 2.5 mi/mi$^2$ on National Forest system lands averaged across the 16 subwatersheds. Road densities would exceed Forest Plan guidelines of 2.5 mi/mi$^2$ in six of the 16 subwatersheds and combined road and motorized trails would exceed 2.5 mi/mi$^2$ in nine of the 16 subwatersheds.

Alternative C distance banding analysis concluded there is no National Forest System land greater than one mile from an open motorized route in the project area resulting in no high quality security cover particularly for elk. Analysis also concluded there is a total of 3,541 acres (3.8 percent) of National Forest System lands greater than ½ mile from an open motorized route which is the fewest of the action alternatives. Patch sizes range from 25 to 1,088 acres and are generally distributed across the entire 93,016 acre project area. Road closures and designation of an established motorized route available for use result in the increase of undisturbed habitat greater than ½ mile from a route. In addition, 56,538 acres (61 percent) of the project area is within 660 feet of an existing road or motorized trail which is the second highest and only behind Alternative A. Approximately 61 percent of the acreage within 660 of a road or trail currently provides hiding cover that would tend to benefit deer more than elk. It is assumed that lands within the 660 foot zone are unavailable for consistent elk use as cover or foraging areas at least during daylight hours when motorized traffic is more likely to occur. This alternative would also provide a total of seven security cover blocks greater than 250 acres in size which is one less than for Alternatives B, D, and E. The blocks are located on Royce Mountain (1,089 acres), Spruce/Swamp Creeks (625 acres), Black Rock pit (250 acres), and the north end of Walker Rim (324 acres) that would benefit deer and elk.

This alternative would likely benefit elk to a greater degree than Alternative A but less than Alternative B. While more road closures are proposed than Alternative B, the design of the trail system impacts more acreage and results in less undisturbed habitat greater than ½ mile from an open road. There would also be one fewer 250 acre security cover block compared to Alternative B. One benefit however, is an increase in security cover in the Hemlock KEA from 287 acres to 625 acres in Alternative C. Smaller parcels of undisturbed habitats are also available ranging from 64 to 227 acres near Crescent Lake Junction and Bunny Butte but may not function the same as the 250 acre blocks (Hillis et al. 1991) described as security cover.

Alternative C would develop a designated trail encompassing the entire project area east of Highway 97. This would create additional motorized disturbance in a mule deer migration zone animals are known to use near Walker Mountain while migrating from summer to winter ranges. To mitigate this impact during spring migration, OHV use on the designated trail system would not be allowed from May 1 through June 15 each year. This restriction would only apply to those designated trails east of Highway 97.

Project Design Features and mitigation measures specified in Chapter 2 and described in Alternative B are all applicable to Alternative C. They include the routing of motorized trails away from hiding cover patches, construction of a wildlife usable underpass on Highway 97 south of the Highway 58 junction,

retention of the Walker Green Dot Road Closure Order, and the construction of a new water guzzler on Walker Mountain. It would also include the seasonal closure for designated trails east of Highway 97 described above.

*Key Elk Habitats*
The Hemlock Key Elk Area (KEA) would be re-configured to include more wet meadow habitat although the total KEA acres would remain the same. The benefits to elk include reduced motorized route densities across the KEA from 3.4 mi/mi$^2$ in Alternative A to 0.7 mi/mi$^2$ in Alternative C. There would also be an increase in security cover from zero acres in Alternative A to 625 acres in Alternative C. The number of elk security blocks greater than 250 acres in size in the Hemlock KEA would also increase to two with this alternative compared to Alternative B with one and none in Alternative A. Collectively these measures would allow greater use of the Hemlock KEA for calving, foraging, and hiding/thermal/ and security cover needs free of motorized disturbance. There would be no change in motorized route densities within the Maklaks KEA.

**Alternative D**
The selection of Alternative D would eliminate the current pattern of disturbance from unregulated cross-country motor vehicle travel (proposed action). This alternative focuses on reducing impacts to big game movement, key elk areas, calving/fawning grounds as well as noise near subdivisions and privately owned lands. High density trail areas (described as dense loops) are proposed around the Junction Sno-Park, west of Highway 97 near Bunny Butte, and west of Highway 97 at the southern end of the analysis area. This alternative would leave large gaps between trail concentrations. The selection of Alternative D would provide approximately 108 miles of motorized trails and 42 miles of roads converted to trails for a total of 150 miles in the trail system. This alternative would also result in the closure/rehabilitation of 95 miles of user-created trails and 114 miles of roads closed to motorized use to balance the increase in designated trails. This proposal would also construct four staging areas two to five acres in size to provide for parking, camping, toilets, learner loops, picnic tables, and fire rings. There would be one staging area within the Junction area, two in the Rivers subunit and one in the Walker subunit. It is projected that motorized use would increase approximately 2.5 to 5.6 percent per year as the OHV trail system develops and becomes more widely known.

*Disturbance*
Open road densities on National Forest system lands only would drop from a current 3.8 mi/mi$^2$ to 1.9 mi/mi$^2$ and road and motorized trail densities combined would also drop from an existing 4.3 mi/mi$^2$ to 2.5 mi/mi$^2$ on National Forest system lands averaged across the 16 subwatersheds. Road densities would exceed Forest Plan guidelines of 2.5 mi/mi$^2$ in five of the 16 subwatersheds and combined road and motorized trails would exceed 2.5 mi/mi$^2$ in eight of the16 subwatersheds.

Alternative D distance banding analysis concluded there is no National Forest System land greater than one mile from an open motorized route in the project area resulting in no high quality security cover particularly for elk. Analysis also showed there is a total of 4,527 acres (4.9 percent) of National Forest System lands greater than the ½ mile from an open motorized route which is the greatest amount of the action alternatives. Patch sizes range from 27 to 1,088 acres. Road closures and designation of an established motorized route available for use result in the increase of undisturbed lands greater than ½ mile from a route. In addition, 53,348 acres (57 percent) of the project area is within 660 feet of an existing road or motorized trail which is the second lowest and only behind Alternative B. Approximately 64 percent of the acreage within 660 of a road or trail currently provides hiding cover that would tend to benefit deer more than elk. It is assumed that lands within the 660 foot zone are unavailable for consistent elk use as cover or foraging areas at least during daylight hours when motorized traffic is more likely to occur. This alternative would also provide a total of eight security cover blocks greater than 250 acres in size which is the same as Alternatives B and E. The blocks are located on Royce

Mountain (1,088 acres), Spruce/Swamp Creeks (668 acres), Black Rock pit (250 acres), and the north end of Walker Rim (507 acres) that would benefit deer and elk.

This alternative would provide the greatest benefits to elk of all the action alternatives based on road closures, trail design and the amount of undisturbed habitats greater than ½ mile from an open road or trail. There is also an approximate 1,000 acre total increase of undisturbed habitats compared to Alternative C. Smaller blocks of undisturbed habitats greater than ½ mile from a road or trail are available in the Junction, Crescent Creek, and Bunny Butte areas ranging from 60 to 227 acres but may not function the same as the 250 acre blocks (Hillis et al. 1991) described as security cover.

One of the major differences in Alternative D as compared to Alternative C is the reduction in designated trail east of Highway 97. The trail system proposed for Little Walker Mountain would remain available but no trail system would be developed north of that area and east of Highway 97. This would reduce motorized disturbance to mule deer crossing Highway 97 during their spring and fall migrations from preliminary telemetry studies (Ardt, ODFW pers. comm. 2009). Alternative D also clusters motorized trails as opposed to more open, widely spaced routes in Alternative C. This would be consistent with recommendations from Hayden et al. (2008) to cluster recreational activities to maintain or create large blocks of undisturbed habitat and direct new development toward previously disturbed areas.

Project Design Features and mitigation measures specified in Chapter 2 and described in Alternative B are all applicable to Alternative D. They include the routing of motorized trails away from hiding cover patches, construction of a wildlife usable underpass on Highway 97 south of the Highway 58 junction, retention of the Walker Green Dot Road Closure Order, and the construction of a new water guzzler on Walker Mountain.

*Key Elk Habitats*
The Hemlock Key Elk Area (KEA) would be re-configured to include more wet meadow habitat although the total KEA acres would remain the same. The benefits to elk include reduced motorized route densities across the KEA from 3.4 mi/mi$^2$ in Alternative A to 0.7 mi/mi$^2$ in Alternative D. There would also be an increase in security cover in the KEA from zero acres in Alternative A to 668 acres in Alternatives D and E. The number of elk security blocks greater than 250 acres in size would also increase to two with this alternative compared to one in Alternative B and none in Alternative A. Collectively these measures would allow greater use of the Hemlock KEA for calving, foraging, and hiding/thermal/ and security cover needs free of motorized disturbance. There would be no change in motorized route densities within the Maklaks KEA.

**Alternative E**
The selection of Alternative E would eliminate the current pattern of disturbance from unregulated cross-country motor vehicle travel (proposed action). This alternative focused on blending public responses incorporating many of the design features riders requested. The selection of Alternative E would provide approximately 97 miles of motorized trails and 42 miles of roads converted to trails for a total of 139 miles in the trail system. The trail system could be defined as a combination of a dense and open loop system. Alternative E would also result in the closure/rehabilitation of 94 miles of user-created trails and 115 miles of roads closed to motorized use to balance the increase in designated trails. This proposal would also construct four staging areas two to five acres in size to provide for parking, camping, toilets, learner loops, picnic tables and fire rings. There would be one staging area within the Junction area, two in the Rivers subunit and one in the Walker subunit. It is projected that motorized use would increase approximately 2.5 to 5.6 percent/year as the OHV trail system develops and becomes more widely known.

*Disturbance*
Open road densities on National Forest system lands only would drop from a current 3.8 mi/mi$^2$ to 2.0 mi/mi$^2$ and road and motorized trail densities combined would also drop from an existing 4.3 mi/mi$^2$ to 2.5 mi/mi$^2$ on National Forest system lands averaged across the 16 subwatersheds. Road densities would exceed Forest Plan guidelines of 2.5 mi/mi$^2$ in six of the 16 subwatersheds and combined road and motorized trails would exceed 2.5 mi/mi$^2$ in eight of the16 subwatersheds. These densities are very similar to Alternatives C and D.

Similar to Alternatives A, B, C, and D distance banding analysis concluded there is no National Forest System land greater than one mile from an open motorized route in the project area resulting in no high quality security cover particularly for elk. Analysis also concluded there is a total of 4,329 acres (4.7 percent) of National Forest System lands greater than the ½ mile from an open motorized route which is the second highest level of the action alternatives. Patch sizes range from 15 to 1,088 acres. Road closures and designation of an established motorized route available for use result in the increase of undisturbed habitat greater than ½ mile from a route. In addition, 54,045 acres (58 percent) of the project area is within 660 feet of an existing road or motorized trail which is the third lowest of the action alternatives. Approximately 63 percent of the acreage within 660 of a road or trail currently provides hiding cover that would tend to benefit deer more than elk. It is assumed that lands within the 660 foot zone are unavailable for consistent elk use as cover or foraging areas at least during daylight hours when motorized traffic is more likely to occur. This alternative would also provide a total of eight security cover blocks greater than 250 acres in size which is the same as Alternatives B and D. The blocks are located on Royce Mountain (1,088 acres), Spruce/Swamp Creeks (668 acres), Black Rock pit (250 acres), and the north end of Walker Rim (416 acres) that would benefit deer and elk.

Alternative E would be expected to have benefits to elk second only to Alternative D based on road closures, trail design and the amount of undisturbed habitats greater than ½ mile from an open road or trail. Smaller blocks of undisturbed habitats greater than ½ mile from a road or trail are available in the Junction, Crescent Creek, and Bunny Butte areas ranging from 45 to 227 acres but may not function the same as the 250 acre blocks (Hillis et al. 1991) described as security cover.

Alternative E is similar to Alternatives B and D in that the designated trail system has been designed to generally cluster the activity in specific areas and that activity east of Highway 97 is primarily focused near Little Walker Mountain. Alternative E does have slightly more widely spaced loops compared to Alternatives B and D near Bunny Butte and south of Highway 58 and west of Highway 97. Because designated trails north of Little Walker Mountain are similar to Alternative D less motorized disturbance would occur to mule deer on their spring and fall migration routes. Preliminary telemetry data indicated this is a high use migration crossing area (Ardt, ODFW pers. comm. 2009). Because much of trail design is in a dense loop system this alternative would also be consistent with recommendations from Hayden et al. (2008) to cluster recreational activities to maintain or create large blocks of undisturbed habitat and direct new development toward previously disturbed areas.

Project Design Features and mitigation measures specified in Chapter 2 and described in Alternative B are all applicable to Alternative E. They include the routing of motorized trails away from hiding cover patches, construction of a wildlife usable underpass on Highway 97 south of the Highway 58 junction, retention of the Walker Green Dot Road Closure Order, and the construction of a new water guzzler on Walker Mountain.

*Key Elk Habitats*
Similar to Alternatives B, C, and D, Alternative E proposes the Hemlock Key Elk Area (KEA) be re-configured to include more wet meadow habitat although the total KEA acres would remain the same. The benefits to elk include reduced motorized route densities across the KEA from 3.4 mi/mi$^2$ in

Alternative A to 0.7 mi/mi$^2$ in Alternative D. There would also be an increase in security cover in the KEA from 0 acres in Alternative A to 668 acres similar as in Alternative D. The number of elk security blocks greater than 250 acres in size would also increase to two with this alternative compared to none in Alternative A and one in Alternative B. Collectively these measures would allow greater use of the Hemlock KEA for calving, foraging, and hiding/thermal/ and security cover needs free of motorized disturbance. There would be no change in motorized route densities within the Maklaks KEA.

**Road Density Further Evaluation**

The Deschutes LRMP uses a threshold road density of greater than 2.5 mi/mi$^2$ requiring further analysis (LRMP WL-53). The further evaluation is a process to determine if a project that exceeds the 2.5 mile level would still result in a net benefit to deer habitat. The density is applied as an average on an implementation unit, which for this project is defined as a sixth-field subwatershed.

Table 82 and Table 83 display current and expected road densities and combined road and motorized trail densities for each alternative analyzed for the Three Trails OHV project. Analysis was completed for each of the 16 subwatersheds that fall within the project area. This increased the analysis area from 93,016 acres in the project area to 161,993 total acres. One assumption used for Alternative A is that all roads present in each of the 16 subwatersheds are currently being used. For Alternatives B, C, D, and E the analysis on open route densities included all roads and trails that are part of the designated trail system and Maintenance Level 2 roads that would remain open for vehicle travel including OHVs.

*Actions designed in Alternatives B, C, D, and E would have a net benefit to deer habitat*

The analysis conducted with the mitigation measures and Project Design Features listed in Chapter 2 show that the net effect of the Three Trails OHV project on deer habitat is consistent with Forest Plan wildlife objectives for the following reasons:

1. For all action alternatives, while some subwatersheds would still exceed the 2.5 mi/mi$^2$ density threshold for open roads, the overall density of open roads only measured across the entire 161,993 acre analysis area would fall to 2.2 mi/mi$^2$ in Alternative B, 1.9 mi/mi$^2$ in Alternative C, 1.9 mi/mi$^2$ in Alternative D, and 2.0 mi/mi$^2$ in Alternative E. This results in meeting the LRMP target density as a result of closing roads and user-created trails not needed for the trail system and/or land management activities.
2. For all action alternatives, the combined density of roads and trails open for motorized use would decrease from an existing 4.3 mi/mi$^2$ in Alternative A to 2.8 mi/mi$^2$ in Alternative B and to 2.5 mi/mi$^2$ in Alternatives C, D, and E. Alternative B would remain above the 2.5 mi/mi$^2$ level but improved from the existing condition.
3. A Project Design Feature has been added to route trails away from mule deer hiding cover to the greatest extent possible during the layout and implementation phase.
4. An underpass for Highway 97 has been proposed to allow OHV users access to trails on either side of the highway but would also be designed to accommodate big game and smaller wildlife species. This would result in less wildlife highway mortality while attempting to cross Highway 97.
5. All action alternatives would have less motorized use permitted within the riparian zones (see Fisheries Report in Chapter 3) allowing mule deer greater access to water resources, forage, hiding cover, and use as fawning habitat.
6. In Alternative C, a seasonal restriction would be in place prohibiting OHV use on designated trails east of Highway 97 from May 1 through and including June 15.
7. Alternatives B, D, and E all propose a designated trail system that minimizes trail use east of Highway 97 to Little Walker Mountain. This strategy with proposed road closures east of Highway 97 reduces motorized disturbance to mule deer during spring and fall migrations in habitats known to experience high use.

8. In all action Alternatives the Walker Green Dot Road Closure Order would remain in effect during the mule deer modern rifle season.
9. OHVs would be prohibited from traveling off designated trails.

**Cumulative Effects on Big Game Habitat**

*Alternative A*

The discussion of effects for Alternative A is the result of past and present actions that have contributed to the current condition on motorized use in the analysis area and hiding cover conditions pertaining to land management actions. These actions include commercial timber harvest entries, small tree thinning, prescribed fire, wildfires, wildlife habitat enhancements such as riparian restoration and guzzler developments, and commercial and personal use firewood removal.

*All Action Alternatives*

Foreseeable actions partially or completely overlap the Three Trail OHV project area include implementation of the BLT Vegetation Management FEIS (ROD 2009) totaling approximately 12,000 acres of commercial thinning and fuels treatments. Also is an expected Categorical Exclusion to continue prescribed maintenance underburning on ponderosa pine stands south of Crescent, Oregon and east of Highway 97 and a Decision Notice for the Crescent Creek Wild and Scenic River Management Plan Environmental Assessment expected in early 2011. The annual small diameter tree thinning CE was accounted for up to the present. Beyond 2009, it is not considered a foreseeable action because details for future small tree thinning are unknown and no scoping has occurred.

The Rim-Paunina Vegetation EIS is currently in the early stages of effects analysis and includes projected management acreage that overlaps with the Three Trails OHV project area. Approximately 10,000 to 14,000 acres of vegetation management may be proposed for treatments including commercial thinning, small diameter thinning and fuels only treatments of small diameter tree removal, and prescribed underburning. Vegetative treatments may require the construction of temporary roads to provide access units but specific details on segment lengths are unavailable at this time. Temporary roads are typically in place for several years and then closed at the completion of all harvest associated activities. Currently, closed roads may also have to be used for haul routes during timber harvest operations although these roads would not be open for public use. Collectively, these actions would have a temporary short-term impact on road densities. In addition, the vegetation treatments would likely result in a reduction in the amount of big game hiding cover in the six subwatersheds of the Rim-Paunina project that also overlap with the Three Trails OHV project. Another short-term impact is the disturbance to big game animals that may be utilizing habitats near OHV trails and/or hiding cover adjacent to active logging operations. All of these foreseeable actions would also take into consideration the provision for maintaining at least the minimum LRMP standards and guidelines for hiding cover, providing forage areas and access to water sources. Over the short- and long-term reduced motorized route densities as compared to the existing condition may result in a decrease in legal and illegal harvest of deer and elk because of less vehicular access even though some treated stands would be more open as a result of tree removal.

All Three Trails OHV action alternatives would develop a designated OHV trail system to replace the current unregulated use that is presently occurring. As shown in several tables motorized route densities would decline from the current levels as a result of closing roads and user-created trails not needed to support an OHV trail system. This would benefit mule deer to a greater degree than elk because deer are common in the project area and that this landscape is already heavily roaded with relatively small percentages of elk security cover defined as blocks of land greater than 250 acres in size and at least ½ mile from an open road or OHV trail.

The Deschutes National Forest is currently in the process of conducting a Forest-wide Travel Management Plan to review and make recommendations to our current motorized access system. This process will do three things:

- Designate specific conditions, if any, under which existing routes or areas will continue to provide for sustainable motorized use considering a variety of societal and resource factors;
- Identify existing roads, trails, and areas that will continue to support sustainable motorized us; and
- Identify potential motorized routes and/or areas that could be added to the forests and grasslands transportation system for motorized use.
-

This process will also consider the Forest Plan guidelines for open road densities on big game summer range. A decision (ROD) is expected in early 2011.

Private land ownership in the analysis area includes rural subdivisions and the community of Crescent Lake Junction. It is assumed these lands do not provide quality big game habitat because of the high level of development that has occurred. East of Highway 97 and forming a common boundary to the Three Trails OHV project area is a large block of industrial timberland managed by Cascade Timberlands. The state of Oregon has purchased a 43,235 acre block of Cascade Timberlands east of Highway 97 and immediately adjacent to the north end of the Three Trails OHV project area. The purchased acres are identified as the Gilchrist State Forest and extend northward halfway between Gilchrist and LaPine. While the industrial timberland acreage has been heavily harvested in the last ten years through a series of commercial thinning, big game hiding cover acreage is available and well distributed because of the dense understory of lodgepole pine providing cover. Big game animals and particularly mule deer would be described as well distributed across the Gilchrist State Forest because of the presence of available forage, hiding cover, natural water sources and maintained guzzlers. Currently, there is no ban on using OHVs on industrial timberlands and motorized users contacted during the Three Trails OHV analysis stated they utilize existing roads and trails as through routes to access National Forest System lands. Consequently, there is no expectation the development of an OHV system on National Forest lands would cause deer or elk to vacate public lands and occupy Gilchrist State Forest lands to a greater degree than already occurs, if any. The Oregon Department of Forestry would manage the Gilchrist State Forest. As of March 2010 a management plan has not been developed and it is unknown what recreational access and motorized travel would be permitted.

## Rare and Uncommon Species

In 1994 the Northwest Forest Plan (NWFP) developed a system of reserves, the Aquatic Conservation Strategy, and various standards and guidelines for the protection of late-successional and old growth associated species. Subsequent decisions have placed some of these species on the Regional Forester's Sensitive Species list and some are now identified as "Strategic" meaning there are information gaps (i.e. distribution, habitat, threats) resulting in status or taxonomic uncertainties. Strategic species are not considered "sensitive" species under Forest Service Manual 2670.

**White-Headed Woodpecker, Black-Backed Woodpecker, Pygmy Nuthatch, Flammulated Owl**
The white-headed woodpecker moved to the "sensitive" species list with the January 31, 2008 Regional Forester's Sensitive Species list update and the effects of the Three Trails OHV proposal on white-headed woodpeckers is discussed under the Threatened, Endangered and Sensitive Species portion of Chapter 3 of the EIS. Discussion on the effects of the project on the black-backed woodpecker is disclosed in the Management Indicator Species section of Chapter 3 of the EIS. Effects to the pygmy nuthatch and flammulated owl are discussed below.

**Pygmy Nuthatch and Flammulated Owl**
***Ecology***
Marshall et al. (2003) described the pygmy nuthatch as a resident of ponderosa pine dominated forests from the east slopes of the Cascades eastward into the Blue and Warner Mountains. It will forage in young ponderosa pines and in lodgepole pines that are adjacent or near ponderosa pine stands. The Pygmy nuthatch is a secondary cavity nester and can take advantage of natural cavities as well as woodpecker created cavities. Nesting is described to be in snags or dead portions of live trees and they reportedly can excavate nest cavities often using cracks to gain entrance to a hollow or decaying wood (Marshall et al. 2003). Pygmy nuthatches may roost in groups within nest cavities (NatureServe 2009). Their diet includes beetles, ants, true bugs, butterfly/moth larvae, spiders, and pine seeds. Foraging pygmy nuthatches concentrate on outer branches high in canopy on needle clusters, cones, emerging shoots, and on the bole rarely utilizing down wood. Typical nest cavities in California were found in decaying pines that usually exceeded 20 inches in diameter and in one study from Arizona the mean diameter at breast height (dbh) of nest cavities was 16 inches (Marshall et al. 2003).

The flammulated owl is one of the smallest owls in North America and is unique in that it preys almost exclusively on insects, primarily at night for nocturnal arthropods, and is a neotropical migrant (USDA 1994b). The species winters in central and southern Mexico, Guatemala, and perhaps El Salvador. In Oregon the species breeds on the eastern slope of the Cascades, Blue, and Wallowa Mountains and in small numbers in the mountains of southwest Oregon (Marshall et al. 2003). Their breeding season reaches its peak between June and July (NatureServe 2009). Flammulated owls are most closely associated with ponderosa pine forest but also nests in mixed coniferous stands dominated by ponderosa pine. Marshall et al. (2003) reported that forested stands used for nesting tend to have moderate to high levels of canopy ranging from 31-94 percent (mean 67 percent) with a rather open understory or an open area adjacent. The species is a cavity nester and in northeastern Oregon ponderosa pine snags was the common nest tree (Marshall et al. 2003). They utilize cavities in live or dead trees created by pileated woodpeckers or northern flicker. Snags and trees used for nesting averaged 22 and 28 inches dbh in two Oregon studies (Goggans 1985; Bull et al. 1990 cited by Marshall et al. 2003).

Little is known on the population status of the flammulated owl and no data is available for the pygmy nuthatch to indicate significant population declines (Marshall et al. 2003). Risks to these species include

loss of mature ponderosa pine forests, fire suppression resulting in overstocked stands and reduced snag recruitment, salvage logging, and chemical use (Marshall et al. 2003). The Oregon State Heritage Program lists pygmy nuthatch ranking as S4, 'Apparently Secure', and flammulated owls as S3, 'Vulnerable' (NatureServe 2009). NatureServe (2009) states the 'Vulnerable' ranking for flammulated owls was due to "loss of snags for firewood or during timber harvest operations that presents a serious threat." In addition, clear cuts and old-growth ponderosa pine stands, the preferred habitat, are shrinking, and in the Rocky Mountain West they are the most endangered forest type (NatureServe 2009).

***Existing Condition***

Viable Ecosystem modeling was done for each species to approximate the amount of potential nesting habitat. Modeling indicates there are approximately 10,267 acres of pygmy nuthatch nesting habitat. The definition used was forests of ponderosa pine, dry to moist Douglas-fir, and white fir with the presence of ponderosa pine, with dense or open canopies and trees greater than 15 inch dbh. This acreage is located on the base and flanks of Walker Rim, scattered patches west of Highway 58, south slopes of Odell Butte and Hamner Butte, and on Muttonchop Butte. Suitable nesting habitat is not thought to exist on private land in the project area because ponderosa pine is limited and of smaller diameter.

Modeling indicates there is approximately 7,691 acres of potential flammulated owl nesting habitat in the project area. The habitat definition used was forests of ponderosa pine, dry to moist Douglas-fir, white fir, and moist Shasta fir with the presence of ponderosa pine, dense or open stands, and with trees greater than 15 inches dbh. This acreage is located on the base and slopes of Walker Rim, scattered patches of ponderosa pine west of Highway 58, Muttonchop Butte, and the ponderosa pine stands of Odell and Hamner Buttes including the Shasta fir areas present above 5,500 feet elevation. Suitable nesting habitat is not thought to exist on private land in the project area because ponderosa pine is limited and of smaller diameter. The acreages account for all past and present timber sales, natural events such as wildfires, and any other habitat altering activity that would express itself in a vegetative manner.

The district wildlife written observational records do not list any pygmy nuthatches although the wildlife survey crews have reported observing pygmy nuthatches while conducting goshawk surveys within the project area. District observation records show eight reports of flammulated owls in the project area, although none are known nests. Observation sites were located near Swamp Creek, Hemlock Creek, and on Forest Service roads 9753, 5815900, 4672100, and 4672060.

***Environmental Consequences***

**Effects Common to All Alternatives**

Noise can be a major factor in wildlife displacement and avoidance of habitat. Though songbirds in general may tolerate disturbances from recreational activities such as walking, vehicles and camping, social species such as pygmy nuthatches in ponderosa pine forests may be less tolerant. Pygmy nuthatches are more social staying in family groups and disturbances may result in less time feeding and caring for young. The young would also benefit from group behavior with more individuals on alert for recreational disturbances (USDA 1997).

Hayward and Verner (1994) found owls can tolerate some human disturbances including human noise such as those associated with camping and staging areas. Flammulated owls have been reported nesting around campgrounds and by other human activity centers (Hamann 1999).

Other potential impacts to both species relate to snag loss from firewood removal. Gunnison (2001) reported that user-created routes can decrease pygmy nuthatch and flammulated owl habitat by providing increased access to snags and other deadwood for firewood harvest. However, on the Crescent Ranger District snag felling is not permitted in wood cutting areas although some incidental amount may still occur.

A 660 foot road buffer analysis was modeled to determine the amount of disturbed nesting habitat present in Three Trails OHV project area. Each side of a road or trail open for motorized use was buffered and then joined with Viable modeling to determine disturbed and undisturbed nesting habitat for each alternative and is displayed in Table 86.

**Table 86. Comparison of Disturbed (Dist.) and Undisturbed (Undist.) Flammulated Owl and Pygmy Nuthatch Nesting Habitat Acres within the Three Trails OHV Project Area.**

| | Alt A | | Alt B | | Alt C | | Alt D | | Alt E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist | Dist | Undist |
| Flammulated Owl | 6196 (81%) | 1495 (19%) | 4095 (53%) | 3596 (47%) | 4222 (55%) | 3469 (45%) | 3923 (51%) | 3768 (49%) | 3996 (52%) | 3695 (48%) |
| Pygmy Nuthatch | 8172 (80%) | 2095 (20%) | 5271 (51%) | 4996 (49%) | 5401 (53%) | 4866 (47%) | 5092 (50%) | 5175 (50%) | 5174 (50%) | 5093 (50%) |

**Alternative A**

**Direct and Indirect Effects**

The selection of this alternative would result in no immediate change in the level of motorized use in the project area, nor where people would be permitted to drive all vehicles including OHVs. As shown in Table 86, 80 percent of the potential nesting habitat for the pygmy nuthatch and 81 percent of the flammulated owl nesting habitat is currently within 660 feet of either side a road or trail that is open to travel or is being used for motorized access in the project area. Based on the literature available, flammulated owls are thought to be sensitive to recreational disturbance including motorized use of roads and trails. As Marshall et al. (2003) mentioned, the risks to flammulated owls include the loss of mature ponderosa pine forests, fire suppression resulting in overstocked stands and reduced snag recruitment, salvage logging, and chemical use, none of which is proposed in the Three Trails OHV project area.

For pygmy nuthatches however, the high level of disturbed nesting habitat due to motorized vehicles of all types may result in their displacement from these areas, a localized effect. As previously mentioned though, the Oregon State Heritage Program lists the pygmy nuthatch as S4, 'Apparently Secure' in the state of Oregon.

Future use of Maintenance Level 1 roads and user-created roads and trails would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest.

**Effects Common to All Action Alternatives**

All action alternatives propose a system of designated roads and trails open for motorized travel including OHVs. The remaining roads would be closed and user-created trails not needed for the trail system would be closed and rehabilitated. Each action alternative was modeled to determine acres of disturbed versus undisturbed nesting habitat for each species as shown in Table 86. All action alternatives result in more than doubling the amount of undisturbed nesting habitat for the flammulated owl and pygmy nuthatch due to road and trail closings in nesting habitat. As previously mentioned based on the literature available, flammulated owls are thought to be sensitive to recreational disturbance including motorized use of roads and trails than some other avian species including the pygmy nuthatch. As Marshall et al. (2003) mentioned the risks to flammulated owls include the loss of mature ponderosa pine forests, fire suppression resulting in overstocked stands and reduced snag recruitment, salvage logging, and chemical use none of which is proposed in the Three Trails OHV project area.

Associated actions with the Three Trails OHV project include the closure and rehabilitation of user-created roads and trails not needed for the trail system. Rocks, boulders, logs, and/or subsoiling would be

employed to close these routes to motorized use with small excavators or bobcat machines as necessary. This has the potential to create additional very short-term disturbance while work is on-going but result in long-term benefits especially to the pygmy nuthatches who are more sensitive to disturbance than the flammulated owl. Also proposed is the construction of several staging areas to provide OHV parking and may include other amenities such as toilets, fire rings, picnic tables, and permit overnight camping. Staging areas would range in size from one to five acres with the larger sites having more facilities. Limited tree and snag removal may be needed for site development. Proposed staging areas within suitable habitat for both species are within the Rivers and Walker zones of the project area. Because these sites would tend to concentrate users as a jumping off point to access trails disturbance especially to pygmy nuthatches would include the entire staging area and likely result in some species displacement. However, total acres of staging areas would probably not exceed twenty-five to thirty acres which represents a small fraction of the 10,267 acres of pygmy nuthatch nesting habitat in the project area. Disturbance effects to the flammulated owl would be less impactive since they have been reported nesting around campgrounds and other human activity centers (Hamann 1999). Consequently, no negative effects to the flammulated owl are expected with the selection of any action alternative.

For the pygmy nuthatch there is an increase in the number of acres of undisturbed nesting habitat in all action alternatives compared to Alternative A, however, 47-50 percent of their modeled nesting habitat would still fall within 660 feet of a motorized route. This would still result in potential species displacement in those areas where motorized use is occurring although to a much lesser degree than Alternative A. The new trail construction needed to connect existing roads and user-created trails is limited and would be less than 80 inches wide depending on the OHV trail objective (side-by-sides versus single track for motorcycles) which would result in no loss of nesting habitat. In addition, mitigation measures would restrict the removal of snags unless needed for safety reasons. The need for new trail construction was factored into the disturbance buffer analysis shown in Table 86. Because less pygmy nuthatch nesting habitat is impacted by noise the effect is even more localized than Alternative A. Fewer pairs or individuals would be impacted with any of the trail systems proposed in the action alternatives compared to Alternative A. Even though future OHV use is projected to increase 2.5-5.6 percent each year uses would be restricted to the designated trail system and cross-country travel prohibited that would maintain undisturbed nesting habitat for the species. As previously mentioned though, the Oregon State Heritage Program lists the pygmy nuthatch as S4, ‘Apparently Secure’ in the state of Oregon.

**Cumulative Effects**

Table 11 was reviewed for projects with the potential for additive effects that overlap in time and space with Three Trails OHV project. The zone of influence for the pygmy nuthatch and flammulated owl is defined as the 93,016 acre project area. Because no negative effects to the flammulated owl were identified with any of the alternatives, no cumulative effects are expected to occur.

For the pygmy nuthatch current and foreseeable projects include the Maintenance Burn CE 2005 (1,933 acres), Prescribed Underburning and Mowing CE 1997 (2,553 acres), BLT EIS 2008 (7,499 acres), Five Buttes EIS 2007 (4,235 acres), and the Rim-Paunina EIS with the Record of Decision expected on approximately 10,000-13,000 acres. All of these projects propose commercial thinning and prescribed underburning that could occur on ponderosa pine dominated stands and/or mixed conifer forests with a ponderosa pine component. These acres could provide nesting habitat for the pygmy nuthatch although not all acres would overlap completely with the Three Trails OHV project area. The potential additive effects include disturbance to nesting pairs associated with logging activities such as timber harvesting and log hauling actions and opening of previously closed roads and/or development of temporary roads for short-term access if conducted during nesting season. Other effects would include potential disturbance associated with spring prescribed underburns if they are conducted during nesting season. However, mitigation measures were provided in all projects for retention clumps, re-closing opened roads and temporary roads that were constructed, and retention of all snags except those deemed a safety

hazard. These effects are all considered short-term and only extend for the life of the particular project, generally less than two to three years or less and not all projects would be implemented at the same time. This would provide undisturbed habitat for nesting pygmy nuthatches every year that the other actions would also be occurring. Because all the projects only result in temporary disturbance and that no habitat would be lost, these actions would not be considered additive effects that would result in a cumulative negative effects to the pygmy nuthatch.

It is estimated in 2011, the Forest Service would implement the Travel Management Rule which restricts off-trail travel to designated routes. This action may or may have occurred by the time this EIS is released. Once the Rule is implemented, then the effects of motorized cross-country travel and use of Maintenance Level 1 roads would cease to exist. The direct and indirect effects discussed would remain valid.

Private lands in the project area are primarily rural housing subdivisions and are not expected to provide the tree diameters utilized by this species. The state of Oregon has recently purchased 43,235 acres of former industrial forest lands adjacent to the project area and east of Highway 97 (Gilchrist State Forest). While extensive timber harvest has occurred here in the last decade, ponderosa pine stands are present although it is unknown if these lands are currently providing suitable habitat for either species. However, depending on future forest management practices much of this acreage is capable of providing nesting habitat for the flammulated owl and pygmy nuthatch and could contribute to increases in populations for each.

**Fringed Myotis, Silver-Haired Bat, Long-Eared Myotis, Long-Legged Myotis, Pallid Bat, and Townsend's Big-Eared Bat**

The Townsend's big-eared bat was placed on the Regional Forester's "sensitive" species list in the January 31, 2008 update. Effects to this species and habitat are disclosed under the Threatened, Endangered and Sensitive Species portion of Chapter 3 of the EIS. Effects to the remaining species are discussed below.

***Ecology***

Most bat species roost and hibernate in crevices in protected sites. Sites commonly used by bats include caves, mines, snags and decadent trees, wooden bridges, and old buildings (USDA 1994 ROD C-43). While snag management guidelines were provided (USDA and USDI 2001 S&G-37-38) the authors of the Northwest Forest Plan determined that additional protection was needed for caves, mines, abandoned wooden bridges, and buildings. Surveys of these structures were recommended to determine bat presence including the fringed myotis, silver-haired bat, long-eared myotis, long-legged myotis, and pallid bat. The purpose of the standard and guideline is to protect these sites from destruction, vandalism, disturbance from road construction, blasting or any other activity that could change cave or mine temperatures or drainage patterns.

The bats in this group vary slightly on habitat use. The fringed myotis uses caves, mines, and rock crevice habitat while the long-legged myotis, long-eared myotis, and the pallid bat utilize buildings, caves, snags and hollow trees. The silver-haired bat relies heavily on standing snags and hollow trees in and adjacent to riparian areas used for foraging (NatureServe 2009).

Most of the myotis species are colonial breeders which can range from 12 to 500 individual but generally contain less than 100 (Christy and West 1993). Silver-haired bats are generally considered solitary breeders though a few nursery colonies have been reported (Christy and West 1993). Most bat species are aerial foragers but a few (long-eared and fringed myotis) also glean insects from the ground or foliage and rely on vision as well as echolocation when hunting (van Zyll de Jong cited in Christy and West 1993). In Oregon, riparian areas are potential foraging habitats for bat species due to high abundance of insect

prey (Grindal 1999; Racey and Swift 1985; Bringham and Fenton 1991; Verts 1998). Most bat species in the Pacific Northwest probably undergo relatively short migrations to and from hibernacula each year although silver-haired bats are believed to migrate fairly long distances (Shump and Shump cited in Christy and West 1993). Pacific Northwest bat species have many predators, but are not a major prey item for any animal group. Therefore, predation is not a major mortality factor. However, the influence of people may have negative effects on bats from disturbances to hibernacula from cave exploration.

Table 87 displays the bat species that are known to occur or may potentially occur within the Crescent Ranger District. Data from the table below is from Perlmeter 1996-1997, Christy and West 1993, NatureServe 2009, and preliminary data results from Manning 2006, Oregon State University.

**Table 87. Bat Species Known or Suspected to Occur and Habitat Requirements within the Crescent Ranger District**

| Species | Oregon Status 2010* | Forage Substrate | Roost Site | Main Prey Species | Comments |
|---|---|---|---|---|---|
| California Myotis | S3 | Forest edges and over water | Cliff faces, tree crevices, caves and structures | Butterflies, Moths, small flies | One offspring per female/season |
| Western Small-footed Myotis | S3S4 | Ponderosa pine and mixed conifer forests | Rock crevices, under boulders, and beneath bark | Small insects | Will also forage over rocks |
| Yuma Myotis | S3 | Riparian, moist woodlands, and open forests | Buildings, caves and bridges | Moths, midges, flies and termites | Closely associated with water and very sensitive to disturbance |
| Little Brown Myotis | S4 | Moist forests and riparian areas | Buildings, bridges, caves, mines, rock crevices, snags | Flies, flying insects | Closely associated with water |
| Long-legged Myotis | S3 | Coniferous forests and riparian areas | Crevices, buildings and caves | Moths | Closely associated with forests |
| Long-eared Myotis | S4 | Forested habitats and forested edges | Snags, hollow trees or rock features | Moths | One offspring per female/season |
| Silver-haired Bat | S3S4 | Forested areas and over ponds and streams | Under bark | Wide variety of insects, soft-bodied prey | Deforestation and loss of snags is a threat |
| Big Brown Bat | S4 | More common in deciduous forests versus coniferous forests | Structures | Beetles | Forages over open areas and uses hollow trees |
| Hoary Bat | S3 | Riparian and brushy areas | Trees | Moths | Solitary breeder and only foliage roosting bat in Pac. Northwest |
| Pallid Bat | S3 | Arid regions and open forest types | Cliff faces, caves, and buildings | Moths and grasshoppers, flightless arthropods | Forages on ground and very intolerant to disturbance |
| Fringed Myotis | S2 | Along forest edges, roads or open areas | Caves, mines, rock crevices, buildings | Primarily moths, beetles, crickets, craneflies, and spiders | One offspring per season; rare in OR and very sensitive to human disturbance |

* Oregon listings from NatureServe 2010 - S2 = Imperiled, S3 = Vulnerable, S4 = Apparently Secure

***Existing Condition***

There are no abandoned building structures, caves, or mines in the Three Trails OHV project area (Hickerson pers. comm. 2008). However, scattered rock outcrops are present along Walker Rim and Black Rock lava flow south of Hamner Butte on National Forest land and extending southward onto private lands north of Crescent Creek. Snags for bat roosting habitat vary considerably across the project area with the highest snag densities per acre located in the mature stands of lodgepole pine and mixed conifer. Snag densities are also still relatively high in the 381 acre of Royce Butte Fire of 2008 although these are small diameter lodgepole pine. Outside the project area, snag densities are still considered very high within the 21,000 acre Davis Fire of 2003.

There were no bat surveys conducted specifically for this project although limited surveys have been conducted in several areas of the Crescent Ranger District. Perlmeter (1996 and 1997) conducted bat surveys under several bridges including a wooden bridge on Odell Creek (outside the project area) and concrete and wooden bridges over Crescent Creek and the Little Deschutes River bridge on Highway 58 (inside the analysis area). One long-eared myotis was detected day roosting under the Odell Creek concrete and wooden bridge during the 1996 survey. In 1997 there were no bats observed roosting under these bridges although foraging activity was noted on both evenings mist nets were set up (Perlmeter 1997). Manning (pers. comm. 2006) conducted a research study on bat use in the Davis Fire area (outside the Three Trails OHV analysis area) of the Crescent Ranger District to determine bat response to salvage logging. Preliminary data suggested long-eared myotis, silver-haired or big brown, and any or all of the following: little brown, long-legged, or small-footed were present in the Davis Fire area. As of April 2010 there is no data on the presence of the following species in the project area or Crescent Ranger District: Yuma myotis, Pallid bat, Fringed myotis, Hoary bat, and California myotis.

As shown in Table 87, there is some overlap in roosting habitat with some species using snags or hollow trees as well as rock structures; however the modeling conducted separated out the two major structure types. For the species associated with snags, hollow trees, and sloughing bark such as the silver-haired bat, modeling showed an estimated 13,540 acres of potential roosting and maternity hibernacula in the Three Trails OHV project boundary. The habitat definition used included forests of lodgepole pine, ponderosa pine, dry to moist Douglas fir, white fir, Shasta red fir, moist to wet mountain hemlock, moist to wet silver fir, and dry whitebark pine stands that have open or closed canopies with trees and/or snags greater than 15 inch dbh. These figures account for all past and present timber sales, natural events such as wildfires, and any other habitat altering activity that would express itself in a vegetative manner.

Modeling was also conducted for the species associated with rock outcrops, cliff faces, mines, and caves such as the fringed myotis. An estimated 1,293 acres of roosting and maternity hibernacula are present in the project area with the majority of the habitat on National Forest lands on the Black Rock lava flow south of Hamner Butte. There are also a few acres of scattered rock outcrops along the face of Walker Rim. Bat habitat is also present on private lands of the Black Rock lava flow although portions of this rock source are used as a gravel source and it is unknown if bat species are present in all or portions of this lava flow. Mines and abandoned buildings are not thought to occur in the project area.

***Environmental Consequences***

Other than cave exploration (spelunking) the effects of recreation on bats is not well understood and the literature on this topic is limited. However, influential human activities likely to impact bats are disturbances to maternal or hibernacula roosts (Harvey et al. 1999). Bats are highly sensitive to disturbance, e.g. human presence near bat habitat, shooting, burning, cave and rock exploration, during their hibernacula period. Disturbance can cause bat to decrease their body weight by 20 to 40 percent and completely diminish their body fat (British Columbia 2002). Human disturbance during these periods could awaken bats while they are resting, which would interfere with their ability to conserve energy.

This could have consequences dependent on the time of year. If they have young, it could potentially cause mortality as the bats move their pups and search for another suitable area. Also, disturbance would hamper the adults in storing fat reserves which are critical for surviving hibernation. Bats that summer on the Crescent Ranger District are not thought to winter here and instead migrate to hibernacula off the district possibly on the Bend-Ft. Rock Ranger District where caves are relatively common.

Table 88 displays the projected amount of disturbed and undisturbed bat habitat in the project area based on application of a 660 foot disturbance buffer of all roads and trails used for motor vehicles including OHVs.

**Table 88. Comparison of Disturbed (Dist.) and Undisturbed (Undist.) Bat Habitat Acres within the Three Trails OHV Project Area**

| Species | Alt A | | Alt B | | Alt C | | Alt D | | Alt E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** | **Dist** | **Undist** |
| Silver-haired Bat* 13,540 acres | 10,268 (76%) | 3,272 (24%) | 6,353 (47%) | 7,187 (53%) | 6,701 (50%) | 6,839 (50%) | 6,270 (46%) | 7,270 (54%) | 6,461 (48%) | 7,079 (52%) |
| Fringed Myotis ** 1,293 acres | 59 (5%) | 1,234 (95%) | 40 (3%) | 1,253 (97%) | 222 (17%) | 1,071 (83%) | 40 (3%) | 1,253 (97%) | 151 (12%) | 1,142 (88%) |
| * Represents all snag, sloughing bark, and hollow tree associated bat species from Table 87<br>** Represents rock crevice, cliff face, and mine associated bat species from Table 87 | | | | | | | | | | |

### Alternative A
### Direct and Indirect Effects

The selection of this alternative would result in no immediate change in the level of motorized use where people are permitted to drive including the OHVs in the project area. It also assumes motorized travel is occurring on closed roads and user-created trails in the project area. Research is not available that defines a set disturbance distance to bats from motorized use and the buffer distance analysis conducted may overestimate the amount of habitat impacted.

As shown in Table 88 for the snag and hollow tree associated species 76 percent of the potential roosting and maternity habitat is within 660 feet of a motorized route. For the species associated with rock features the percentage of potential roosting and maternity hibernacula within the 660 feet disturbance buffer is 5 percent. While disturbed habitat acres are high for species associated with snags, hollow trees, and sloughing bark, it is currently unknown how much impact this is having on any of the species listed in Table 88. It is possible motorized disturbance may interrupt normal inactivity periods during the day causing them to wake up and/or interfere with raising their pups. Most of the species listed in Table 87 are listed as “Vulnerable or Apparently Secure” with the threats generally associated with deforestation, disturbance of roost sites and hibernaculum especially maternity colonies, through recreational caving and mine exploration (NatureServe 2010). As previously mentioned there are no known caves or mines on the district and several species including the Yuma myotis, Pallid bat, Fringed myotis, Hoary bat, and California myotis have not been detected from limited surveys. While individual bats or maternity colonies associated with snags, hollow trees ,or sloughing bark may be impacted by motorized disturbance the disturbance area is relatively small compared to the 315,000 acre Crescent Ranger District and would not cause a change in NatureServe to change species listing.

### Effects Common to All Action Alternatives (B-E)

All action alternatives are similar in that a designated OHV travel system would be in place using a combination of open roads, roads converted to OHV trails, existing user-created trails, and new trail

development. Roads and trails not designated for travel would be closed to vehicle use and user-created trails not needed for the system would be closed and rehabilitated.

A 660 foot road buffer was modeled for analysis to determine the disturbed distance on each side of an open motorized route for the entire Three Trails OHV project area. It was assumed for modeling purposes that motorized travel whether by passenger car, four-wheel drive trucks, or OHVs would create similar disturbance within the 660 foot disturbance buffer. The acreage of disturbed versus undisturbed habitat with potential roosting and/or maternity hibernaculum is displayed in Table 88.

Based on Project Design Features in Chapter 2 it is assumed that minimal tree removal would be needed for new trail construction because of narrow OHV wheelbase and would be primarily small diameter trees less than nine inches dbh although an occasional larger tree may need to be removed. Snag felling for trail construction and annual maintenance such as snags across trails would be minimal, likely less than five to ten snags/year based on data from the OHV systems on the Bend/Ft. Rock Ranger District. Consequently, the loss of snags would be nearly immeasurable across the project area that would potentially impact roosting bats.

The implementation of a designated OHV system would have the potential to negatively effect roosting and/or maternity colonies of bats through motorized disturbance if trails are adjacent to roost sites. At the present time, roosting or maternity sites in forested stands or rock outcrops or lava fields are not documented but assumed to exist. Table 88 displays the results of disturbance modeling for bats associated with rocks and snags, hollow trees, and sloughing bark. For the silver-haired and hoary bats that use snags, hollow trees, and bark all actions alternatives result in more than doubling or nearly doubling the amount of undisturbed bat habitat in the project area. This is due to road closures, closure and rehabilitation of user-created trails and/or placement away from stands with trees large enough to provide bat roosting and maternity sites. Road and trail rehabilitation would occur using a small excavator as needed to place rocks, boulders, logs, and use of equipment to subsoil impacted roads and trails to restore native vegetation. This would only create a very short-term disturbance if adjacent to rock outcrops and/or snags where roosting bats may occur.

Other connected actions with the OHV project is the creation of staging areas for OHV parking and may also include toilets, picnic tables, and fire rings depending on the alternative some staging areas may allow overnight camping. These actions would result in high density people/disturbance areas but would be from one or two acres in size up to a maximum three to five acres. Total acreage of the staging is not likely to exceed a total of 25 to 30 acres with several sites already developed including Junction Sno-Park and Crescent Creek Campground. Because these sites would be high use, snag felling would be required to remove the hazard trees. This has the potential to remove occupied bat roosting sites although compared to the snags likely present on a 93,016 acre project area, the numbers are nearly un-measurable.

For the rock associated bat species including the Fringed myotis, pallid bat, big brown, and Yuma myotis Alternatives B and D are identical in that there is a small reduction in the amount of rock outcrop, crevices, and lava rock disturbed by motorized traffic from five percent in Alternative A to three percent in B and D. However, Alternatives C and E would result in an increase in disturbed habitat as compared to Alternative A. This is due to the placement of OHV trails adjacent but not on the Black Rock lava flow. Project design and trail construction would route trails off the lava formations so there would be no driving over rock in any alternative. The projected increase in disturbed habitat although the edge of the lava formation may result in less roosting bats and re-location into suitable roost sites further into the lava formation. In spite of the increase in disturbed habitat, 83 percent of the potential roosting habitat would remain in an undisturbed condition.

Several species are known to use both caves, mines, abandoned buildings, rock outcrops as well as hollow trees, snags and bark including the California myotis, small-footed myotis, little brown bat, long-legged bat, and the long-eared bat. Table 88 shows that undisturbed habitats for all species combined greatly increases in all action alternatives as compared to Alternative A. Overall, this would result in less disturbance to roosting bats as compared to Alternative A for all species associated with hollow trees, snags and those that would utilize snags, hollow trees as well as rock outcrops and lava rock formations. Because less disturbance would occur, roosting bats would be expected to accumulate fat reserves to carry them to their winter roost sites and in better condition to withstand the winter period.

OHV use is projected to increase 2.5-5.6 percent annually which means more people and use on the trails and roads open for use with most occurring during the day light hours. Because the limited research on bats is related to disturbance to roosts and recreational cavers, it is unknown if additional OHV would create more disturbance to roosting bats.

**Cumulative Effects**

Table 11 was reviewed for projects with the potential for additive effects that overlap in time and space with the Three Trails OHV project. The zone of influence for the bat species is the 93,016 acre project area.

For the species that use bark crevices, sloughing bark and hollow trees and snags, projects that overlap in time and space include the Maintenance Burn CE 2005 (1,933 acres), Prescribed Underburning and Mowing CE 1997 (2,553 acres), BLT EIS 2008 (7,499 acres), Five Buttes EIS 2007 (4,235 acres), and the Rim-Paunina EIS with a Record of Decision expected in early spring of 2011 on approximately 10,000-13,000 acres. All of these projects propose commercial thinning and/or prescribed underburning that would occur on ponderosa pine dominated stands and/or mixed conifer forests with a ponderosa pine component. Mitigation measures in all thinning projects propose the retention of snags unless deemed a safety issue to forest workers. All prescribed burns also have mitigation measures for snag retention and to buffer rock outcrops, cliff faces, or other rock features that may provide roosting habitat for bats. Not all of the acreage listed above overlaps with the Three Trails OHV project, with the exception of Rim-Paunina, but the mitigation measures apply to all projects. The only potential additive effects include disturbance to roosting bats associated with logging activities such as noise from harvesting and log hauling actions and opening of previously closed roads and/or development of temporary roads for short-term access. However, these effects are all considered short-term and only extend for the life of the particular project, generally less than two to three for thinning and same year only for prescribed underburning. The mitigation measures listed above are designed to minimize impacts to roosting bats whether are associated with snags, rock outcrops, or both. The collective implementation of all these projects are not expected to create long-term negative impacts to bats because few snags would be removed , no rock outcrops removed and no driving would occur on lava formations that may be providing bat roosts. Therefore, additive cumulative are not anticipated to occur with the implementation of the Three Trails OHV project.

Private lands in the project area are primarily rural housing subdivisions and it is currently unknown if any bats are present on these lands. Generally speaking, snag densities are low on private lands and they may not be large enough to function as bat roosting sites and rock outcrops are not thought to be present. The state of Oregon has recently purchased 43,235 acres of former industrial forest lands adjacent to the project area east of Highway 97 (Gilchrist State Forest). While extensive timber harvest has occurred here in the last decade, some limited snag habitat is present that may offer tree, snag, and hollow log associated bat species roosting sites. Depending on future forest management practices much of this acreage may be able to increase its capability to support bats over the coming decades.

The Three Trails OHV project would be consistent with the guidelines project in the Northwest Forest Plan Record of Decision (NWFP ROD p. C-43) for additional protection for caves, mines, and abandoned wooden bridges and bridges used as roost sites for bats because these features are not known to present or would not be impacted by project actions. Pages C-45-47 of the NWFP ROD also provides snag provisions for pygmy nuthatches and flammulated owls. The Three Trails OHV project is consistent with this direction because snag removal would only occur for annual trail maintenance, hazard tree removal within staging areas and for limited new trail construction which would result in very few snags taken down.

**Great Gray Owl**

The great gray owl is a Management Indicator Species for the Deschutes National Forest and effects to this species and habitat is disclosed in the Management Indicator Species section in Chapter 3 of the EIS.

# Old Growth Management

**Introduction**

The Deschutes Land and Resource Management Plan (LRMP) designated Old Growth Management Areas (OGMA) in order to provide stands of old-growth tree to preserve natural genetic pools, provide habitat for plants and wildlife species associated with over-mature tree stands, contribute to the diversity spectrum, and provide aesthetic appeal (LRMP p.4-2). The distribution and minimum size of old growth areas were based upon the habitat requirements of three indicator species: pine martens in the mixed conifer forest, goshawk in the ponderosa pine forest, and three-toed woodpecker in the lodgepole pine forest.

Key standards for this project from the amended LRMP include the following:

***Recreation***

"M15-1 Concentrated human activity is not compatible in this Management Area but dispersed recreation is generally acceptable" (LRMP 4-149).

"M15-3 Concentrated use by off-highway vehicles and snowmobiles will not be permitted but incidental use of OHV's and snowmobiles will generally be permitted" (LRMP 4-150).

***Transportation***

"M15-14 Access by road or trail will be limited to minimum standard and density that meets the objectives of this Management Area. Roads no longer needed will be closed and allowed to re-vegetate naturally. Helipads and transmission corridors will not be allowed" (LRMP 4-150).

**Analysis Methods, Units of Measure and Assumptions**

This sections focus is on focal species habitat within the OGMAs, as well as the diversity of other species dependent on late and old structure that may be affected by disturbance of vehicles. For the effect of this project on individual focal species (goshawk, marten and three-toed woodpeckers), reference the MIS section in this chapter.

Habitat for the focal species is not limited to the OGMA but provided throughout the project area.

**Analysis Measures**

***Road Densities –*** Existing roads have replaced habitat that existed at one time. To measure existing condition and the change with each action alternative, miles of road per square mile of area within the OGMA is the measure used.

***Habitat for Focal Species*** – It is assumed trails are narrow (averaging 50 inches) and do not require the clearing width of roads; therefore they do not remove habitat. However, the associated disturbance from motorized use affects the use of the habitat by some species. High densities of roads and trails within an OGMA could potentially render an area unsuitable. Because goshawks are affected by vehicle noise, habitat within the 200 meter disturbance zone of roads and trails would be one unit of measure of affects. For an explanation of methods and science used for determining habitat and the disturbance zone, reference the Methods and Assumptions at the beginning of the Wildlife section in Chapter 3.

***Species Diversity –*** The focal species in OGMAs were selected because they were endemic and their habitat requirements were thought to be similar or exceed other species dependent on late and old structure (LRMP 4-149). However, marten and the woodpeckers that are less affected by road disturbances may not represent the species with similar habitat needs. Road density and associated noise has potential to effect most wildlife (AMEC 2005; Gaines et al. 2003; Ouren et al. 2007). The amount of

OGMA within the 200 meter disturbance zone of roads, trails, and railroads and associated disturbances could affect the ability of the OGMA to provide for a diversity of species that depend on late and old structure. To analyze effect to these species, habitat which was not tied to a specific habitat type was modeled for late- and old-growth characteristics and then the "undisturbed habitat" was filtered to determine effect. The unit of measure for this analysis is the percent of the OGMA within the disturbance effect zone. Utility corridors for gas and powerlines where also factored into the analysis because of the associated motorized use.

**Analysis Not Included**

***Concentrated Use Areas*** – OHV riding is considered dispersed recreation like any other trail use such as snowmobiles and mountain bikes (Forest Plan, page 4-4). Destination areas such as staging areas, trail heads, or campgrounds concentrate people in one location. There are no destination areas proposed within the OGMAs in accordance with management direction (LRMP M15-1, M15-3 1990).

***Existing Roads*** – There are no new roads being constructed as part of the actions in any alternative. Fragmentation of habitat that occurred when existing roads were constructed is considered within the existing condition of available habitat. It is assumed additional fragmentation of habitat does not take place with changing the use of an existing road. Fragmentation and the associated disturbance is considered within the 200 meter road disturbance zone as described in the Methods and Assumptions in the Wildlife section in Chapter 3.

**Existing Condition**

There are 10 designated Old Growth Management Areas (OGMAs) that are entirely or partially within the project area (Figure 26).

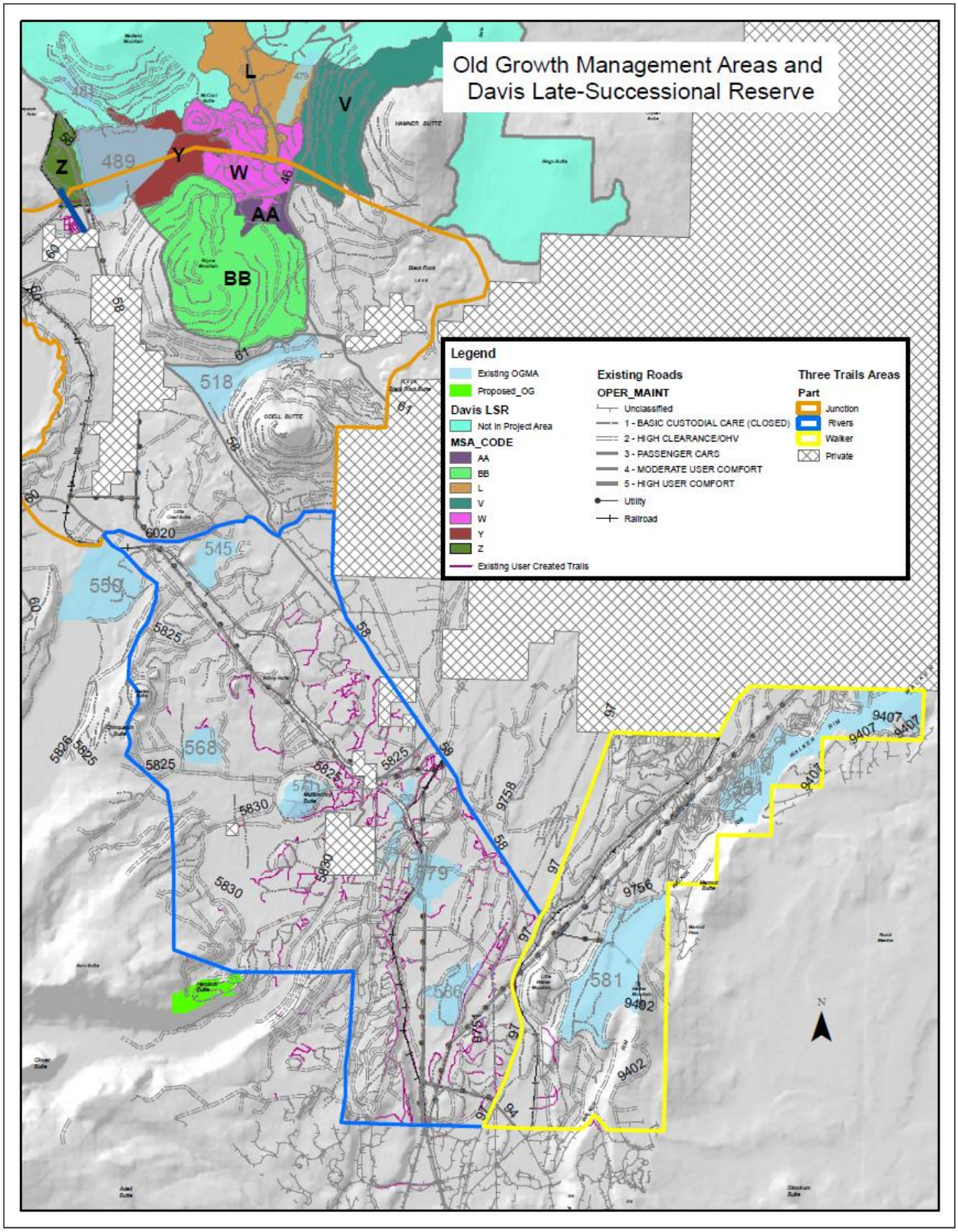


**Figure 26. Old Growth Management Areas and Existing Roads and Trails**

***Odell Creek* OGMA *(id#489)*** is 1,585 acres along both sides of Odell Creek and almost entirely within the Davis Late Successional Reserve (LSR). The OGMA is predominately (88 percent) lodgepole pine with wet mixed conifer, wet shrub lands, and wet meadows. The focal species for this OGMA is three-toed woodpecker and marten. In 2008, approximately 90 acres of Odell Creek OGMA burned in the Royce Fire. In 2010, three-toed, as well as black-backed woodpeckers were documented in the burn, along with a hairy woodpecker (Notis, pers. comm. 2010). There are no documented sightings of marten in this OGMA.

Approximately 474 acres of this OGMA is within the Three Trails OHV project area, including the 90 acres in Royce Fire. Approximately 428 acres of this OGMA were identified as three-toed woodpecker nesting habitat. For other species dependent on late and old structure, approximately 28 percent of this OGMA falls within the disturbance zone.

There are 0.40 miles of Maintenance Level 1 road within the project area of this OGMA.

***Crescent Creek* OGMA *(id#518)*** is approximately 970 acres located along both sides of Crescent Creek east of Highway 97 and is almost entirely overlaid by the Crescent Creek Wild and Scenic River Corridor. It is also entirely within the Three Trails OHV project area. This OGMA is predominately (63 percent) lodgepole pine with mixed conifer, ponderosa pine, wet shrub land and riparian associated vegetation. The focal species for this OGMA are the three-toed woodpecker, goshawk and marten. There have been no documented sightings of these focal species.

Approximately 757 acres of the OGMA is identified as three-toed nesting habitat and 249 acres identified as marten habitat. For other species dependent on late and old structure, approximately 66 percent of the OGMA is within a disturbance zone.

This OGMA is bounded on the north by the Crescent Cutoff road and the east by approximately one mile of Highway 58 (Maintenance Level 5). It has approximately two miles of internal roads, one mile of Maintenance Level 1 road, and 1 mile of Maintenance Level 2. There are no user-created trails within this OGMA.

***Little Odell OGMA (id#545*)** is 348 acres located southwest of Little Odell Butte and entirely within the project area. This OGMA is predominantly (80 percent) lodgepole pine with shrub and riparian habitat. Little Odell Creek is an intermittent stream that runs through the upper third of the OGMA. The focal species are the three-toed woodpeckers and marten. District records do not list any marten or three-toed woodpeckers sightings in or near this OGMA.

Approximately 227 acres of the OGMA were identified as three-toed nesting habitat and 157 acres as marten habitat. For other species dependent on late and old structure, 34 percent of this OGMA is within the disturbance zone.

This OGMA is not fragmented by roads and provides few roads for access into the area. It has a railroad and 0.6 miles of Maintenance Level 2 and railroad maintenance access road that affects the southwestern boundary. OHV use occurs along the railroad.

***The 5825 OGMA (id#568)*** is 313 acres located north of the 5825 road and west of Highway 58. This OGMA is 100 percent lodgepole pine with focal species three-toed woodpeckers and marten. District observational records show a three-toed sighting in 1997 and a marten sighting in 2001 in close proximity but outside of the OGMA boundary.

Approximately 300 acres of the OGMA were identified as three-toed woodpecker habitat and 263 acres as marten habitat. For species dependent on late and old structure, approximately 40 percent is within the disturbance zone.

This OGMA has very few roads. There are 0.23 miles of Maintenance Level 1 road and 0.4 of Maintenance Level 2 road within the boundary and 0.1 mile of user-created trail that originates off the Maintenance Level 2 road which extends along the outside of the boundary.

***Muttonchop OGMA (id#571)*** is 361 acres located on Muttonchop Butte. This OGMA is dominated (30 percent) by sugar pine and ponderosa pine on the lower slopes transitioning to (68 percent) mixed conifer at the higher elevations. The focal species are three-toed woodpecker, goshawk, and marten. The upper part of the butte provides goshawk nesting habitat. Marten have been documented in District records and three-toed woodpeckers and goshawk have not.

In 2000, a stand replacement fire covered approximately 71 acres (20 percent) of the Muttonchop OGMA, reducing approximately 33 acres of ponderosa pine habitat and 38 acres of mixed conifer habitat to an early succession stage. The area was reforested in 2001.

Approximately 278 acres of three-toed habitat, 174 of goshawk habitat and 68 acres of marten habitat are identified within this OGMA. Approximately 83 percent of goshawk habitat is within the disturbance zone. For species dependent on late and old structure, approximately 91 percent of this OGMA is within the disturbance zone.

There are 0.66 miles of Maintenance Level 1 roads and 1.09 miles of Maintenance Level 2 roads within and along the boundary of this OGMA. It also has a 4-acre rock pit that is currently active for rock removal. The rock pit is a favorite play area for OHVs because of the vertical challenges and close proximity to the Two Rivers North community. In addition to the rock pit, there are approximately three miles of user-created trails that lead in and around the rock pit connected by Maintenance Level 1 and 2 roads, and it includes several hill climbs within the burn area. In all action alternatives, a Forest Plan Amendment has been proposed to move this OGMA from Muttonchop Butte to a large block of mixed conifer habitat better suited for the focal species.

***Little Deschutes River OGMA (id #570 and #575)*** is 257 acres located east of the Two Rivers North community and near the Little Deschutes River. Both are described as one OGMA. This OGMA is bisected by a narrow strip of private railroad land with two sets of railroad tracks bisecting id #570 to the north and #575 to the south. This OGMA is primarily (93 percent) ponderosa pine with minor components of riparian and lodgepole pine. The focal species for this OGMA is goshawk. There are no recorded observations in the vicinity.

Approximately 60 acres of the OGMA were identified as goshawk habitat. All of which is within a disturbance zone. For other species dependent on late and old structure, 96 percent of this OGMA is within a disturbance zone.

In addition to the railroad, this OGMA has approximately 0.6 miles of Maintenance Level 1 road and 1.6 miles of Maintenance Level 2 road crisscrossing through it. There are also 0.8 miles of user-created trails.

***Railroad OGMA (id#579)*** is 540 acres located south and east of the Little Deschutes River OGMA. This OGMA has both railroad and utility lines running through it and they are factored into the disturbance calculations because of the associated motorized use. The OGMA is primarily lodgepole pine (73

percent) with a component of ponderosa pine. The three-toed woodpecker is the focal species, although there are no documented sightings in the area.

Approximately 367 acres of the OGMA were identified as three-toed woodpecker habitat. For other late and old structure dependent species, approximately 75 percent of this OGMA is within a disturbance zone.

There are approximately two miles of railroad tracks, four miles of utility corridors and 2.4 miles of user-created trail within the railroad and utility corridors. There is one mile of Maintenance Level 1 roads and 3.6 miles of Maintenance Level 2 roads.

***9751 OGMA (id#586)*** is 525 acres located in the southern portion of the project area, west of Highway 97 along the 9751 road. The OGMA is predominately ponderosa pine (70 percent) with stands of lodgepole pine mixed in. The focal species are goshawk and three-toed woodpeckers. There are no documented sightings of either species within or adjacent to this area.

Approximately 244 acres of goshawk habitat and 150 acres of three-toed habitat have been identified within this OGMA. Approximately 85 percent of the goshawk habitat is within a disturbance zone. For other species dependent on late and old structure 87 percent of this OGMA is within a disturbance zone. The OGMA is bounded on the east boundary by approximately one mile of natural gas pipeline right-of-way that is also used as a motorized travelway and includes 1.4 miles of user-created motorized trail. Along the northern boundary and through the eastern edge of the OGMA is approximately 1.8 miles of Maintenance Level 2 roads. Through the middle of the OGMA are 1.7 miles of Maintenance Level 1 roads.

***Walker Mountain OGMA (id#581)*** is the largest OGMA within the project area. It is 1,936 acres located east of Highway 97 on the southern portion on rim on Walker Mountain. It is predominately mixed conifer dry (78 percent). The lower slopes are ponderosa pine which transitions to mixed conifer consisting of ponderosa pine, Douglas-fir, and sugar pine. The focal species for this OGMA are the goshawk, marten, and three-toed woodpecker. Marten are documented in and around the area, but goshawks and three-toed woodpeckers are not.

Approximately1,692 acres of three-toed woodpecker habitat, 757 acres of goshawk habitat, and 310 acres marten habitat have been identified. Approximately 33 percent of the goshawk habitat is within a disturbance zone. For other species dependent on late and old structure, 55 percent is within the disturbance zone.

The Walker Mountain OGMA is almost entirely encircled with roads. There are approximately 1.4 miles of Maintenance Level 1 and 5.3 miles of Maintenance Level 2 roads on the boundary. Internally, there are 5.5 miles of Maintenance Level 1 road. There are no known user-created trails within this OGMA.

***Walker Rim OGMA (id#561)*** is 1,931 acres located on the northeastern most portion of the planning area up on rim, north of Walker Mountain. The habitat is nearly split with 50 percent in ponderosa pine and 44 percent in mixed conifer. The remaining six percent is lodgepole pine. The focal species are goshawk, marten, and three-toed woodpecker. There is documented goshawk use in and around the area, but no known marten or three-toed woodpecker sightings.

There are approximately 1,111 acres of goshawk habitat, 996 acres of three-toed habitat, and 517 acres of marten habitat identified. Forty-eight percent of the goshawk habitat is within a disturbance zone. For other species dependent on late and old structure, 66 percent of this OGMA is within a disturbance zone.

There are nine miles of Maintenance Level 2 roads along the boundary. There are also approximately 1.7 miles of Maintenance Level 1 and eight miles of unclassified roads internally. The unclassified roads are older roads from a former land exchange with a Crown Pacific LTD that were not assigned a maintenance level and are generally considered to be Maintenance Level 1 roads. There are no user-created trails within or adjacent to the Walker Rim OGMA. OHV use occurs on existing roads.

**Direct and Indirect Effects**
**Alternative A**
There would be no change to current management with the implementation of this alternative. There would be no roads closed. Existing condition would continue as described until the Travel Management Rule would be implemented on the Deschutes National Forest.

**Road Densities**
The density of roads and trails vary widely between the OGMAs (Table 89). The number of acres in the Little Deschutes and Muttonchop OGMAs are small; therefore very few roads result in a relatively high density.

**Table 89. Densities of Roads and User-created Trails**

| OGMA | Acres | Miles² | Miles of Road | Density of Roads Miles/Miles² | Miles of User Created Trails | Density of Trails Miles/Miles² |
|---|---|---|---|---|---|---|
| Odell Creek | 1585 | 2.5 | 2.5 | 1.0 | 0.0 | 0.0 |
| ***Total within Project Area*** | ***474*** | ***0.7*** | ***0.4*** | ***0.6*** | ***0.0*** | ***0.0*** |
| | | | | | | |
| Crescent Creek | 970 | 1.5 | 4.0 | 2.6 | 0.0 | 0.0 |
| Little Odell | 349 | 0.5 | 0.6 | 1.1 | 0.0 | 0.0 |
| Walker Rim | 1931 | 3.0 | 19.0 | 6.3 | 0.0 | 0.0 |
| 5825 | 313 | 0.5 | 0.6 | 1.3 | 0.1 | 0.2 |
| | | | | | | |
| Little Deschutes River A | 84 | 0.1 | 0.2 | See Total | 0.6 | See Total |
| Little Deschutes River B | 173 | 0.3 | 1.9 | See Total | 0.2 | See Total |
| ***Little Deschutes River Total A+B*** | ***257*** | ***0.4*** | ***2.2*** | ***5.4*** | ***0.8*** | ***2.0*** |
| | | | | | | |
| Muttonchop | 361 | 0.6 | 1.8 | 3.2 | 2.7 | 4.7 |
| Railroad | 540 | 0.8 | 4.6 | 5.5 | 2.5 | 2.9 |
| Walker Mountain | 1936 | 3.0 | 12.3 | 4.1 | 0.0 | 0.0 |
| 9751 | 525 | 0.8 | 3.5 | 4.3 | 1.4 | 1.7 |

**Focal Species Habitat**
The amount of habitat within each OGMA varies as displayed in Table 90. The existing habitat is a result of past management and natural disturbances processes. While there may be a range of habitats for species within all OGMAs, the amount or potential may be limited. The habitat displayed is for the focal species of that particular OGMA for which it is to be managed.

**Table 90. Acres of Habitat for Focal Species**

| Old Growth Management Area | OG ID | Total Acres | Three-toed Wood-pecker | Goshawk | Marten |
|---|---|---|---|---|---|
| Odell Creek | 489 | 1585 | 1485 | | 714 |
| ***Total within Project Area*** | | | ***428*** | | ***399*** |
| | | | | | |
| Crescent Creek | 518 | 971 | 757 | 201 | 249 |
| Little Odell | 545 | 349 | 277 | | 157 |
| Walker Rim | 561 | 1934 | 996 | 1111 | 517 |
| 5825 | 568 | 313 | 299 | | 263 |
| | | | | | |
| Little Deschutes River A | 570 | 84 | 0 | 45 | |
| Little Deschutes River B | 575 | 173 | 49 | 15 | |
| ***Little Deschutes Total A+B*** | | ***257*** | ***49*** | ***60*** | |
| | | | | | |
| Muttonchop | 571 | 361 | 278 | 174 | 68 |
| Railroad | 579 | 540 | 367 | | |
| Walker Mountain | 581 | 1936 | 1692 | 757 | 310 |
| 9751 | 586 | 525 | 150 | 244 | |

In OGMAs, where there is marten or three-toed woodpeckers, they would continue to provide habitat because they are less affected by road disturbance. OGMAs that provide goshawk habitat vary in their ability to provide undisturbed habitat because of the species sensitivity to disturbance. Table 91 displays the amount of disturbed habitat within each OGMA. Crescent Creek, Walker Rim, and Walker Mountain OGMAs have moderate to low amounts of disturbed habitat and are functional for goshawks. Little Deschutes River, Muttonchop, and 9751 OGMAs have a high level of disturbed habitat and may be nonfunctional for goshawk.

**Table 91. Percent of Goshawk Habitat within a Disturbance Zone**

| Goshawk OGMA | Acres of Habitat within Project Area | Percent of Habitat Disturbed |
|---|---|---|
| Crescent Creek | 201 | 57 |
| Walker Rim | 1111 | 48 |
| | | |
| Little Deschutes River A | 45 | 92 |
| Little Deschutes River B | 15 | 100 |
| ***Total Little Deschutes River*** | ***60*** | ***93*** |
| | | |
| Muttonchop | 174 | 83 |
| Walker Mountain | 757 | 33 |
| 9751 | 244 | 85 |

**Species Diversity**
Similar circumstances exist for other species dependent on late and old structure. Table 92 displays the amount of each OGMA that is within a disturbance zone. Odell Creek, Little Odell, 5825, and Walker Mountain OGMAs have a low to moderate amount within a disturbance zone, which includes an ability to provide for species dependent on late and old structure. Crescent Creek, Walker Rim, Little Deschutes River, Muttonchop, Railroad, and 9758 OGMAs have high proportions within a disturbance zone and may not function for the purpose of providing diversity for late- and old-structure dependent species.

**Table 92. Percent of OGMA within a Disturbance Zone**

| OGMA | ID# | Acres within Three Trails Project Area | Acres Disturbed | Percent Disturbed |
|---|---|---|---|---|
| Odell Creek | 489 | 474 | 135 | 28 |
| Crescent Creek | 518 | 970 | 638 | 66 |
| Little Odell | 545 | 349 | 119 | 34 |
| Walker Rim | 561 | 1931 | 1267 | 66 |
| 5825 | 568 | 313 | 125 | 40 |
| | | | | |
| Little Deschutes River A | 570 | 84 | 76 | 91 |
| Little Deschutes River B | 575 | 173 | 171 | 99 |
| ***Little Deschutes River*** | ***Total*** | ***257*** | ***247*** | ***96*** |
| | | | | |
| Muttonchop | 571 | 361 | 328 | 91 |
| Railroad | 579 | 540 | 403 | 75 |
| Walker Mountain | 581 | 1936 | 1065 | 55 |
| 9751 | 586 | 525 | 456 | 87 |

**Direct and Indirect Effects Common to All Action Alternatives**
All action alternatives close many more miles of roads than they designate for shared use and close and rehabilitate all user-created trails except in Alternative C where 0.9 miles of new trail is constructed. Reference Table 94 for a summary of effects.

***Hazard Tree Felling***
Hazard trees on trails are only removed where they are leaning across the trail. This is estimated to be less than five to ten snags removed per year project-wide including the OGMAs, based on maintenance conducted for OHV trails on the Bend/Ft. Rock Ranger District of the Deschutes National Forest. The loss would be so small that it is immeasurable on the scale of available habitat inside and outside of OGMAs for marten, goshawk, or three-toed woodpeckers.

Road Maintenance is an on-going action on all Maintenance Level 2 and greater roads across the District and the Forest. As part of managing roads, hazard trees are identified according to the regional Hazard Tree Identification guide by trained and certified personnel on a priority basis based on maintenance level and amount of use. As hazard trees are identified, they are felled and retained for down wood. These trees may or may not be dead and/or provide a habitat component for goshawk, marten, and/or three-toed woodpeckers. Contracts for commercial vegetation management require hazard tree felling on all haul routes. As in the past of all projects, these trees are felled and detained for down wood, except when they

are live and occur within a harvest unit. On average, there are less than 20[50] hazard trees felled along roadsides across the Crescent Ranger District each year. As a result, felling of hazard trees is generally so small it cannot be measured as it relates to available habitat. The exception has been in the Davis Fire, where a concerted effort to fell danger trees has begun because of the age of the fire and the hazard the trees pose to travel. Approximately 200 danger trees have been felled and it is expected that another average of 200 would be felled each year for the next two years. It is estimated 600 trees would be eventually felled across the 21,000-acre fire area. This equates to 0.03 trees per acre of fire area and there is ample snag habitat remaining. Across the district, the number of danger trees removed compared to the available habitat outside of the road corridors and areas where the public is invited to recreate is so small, it is immeasurable.

All action alternatives propose some level of shared use roads through portions of various OGMAs (Table 93). Designation of roads as part of a shared use trail system does not increase the standard for hazard trees removal. It may place these roads at a higher priority for identifying and felling danger trees where there is an increase in use. These trees along roads would continue to be felled as they are identified and retained for down wood.

Therefore, there would be an immeasurable reduction in potential standing habitat for goshawk, three-toed woodpeckers, and marten and a corresponding increase in amount of down wood..

**Table 93. Proposed Shared Use Roads in OGMAs by Alternative**

| OGMA | Alternative B | Alternative C | Alternative D | Alternative E |
|---|---|---|---|---|
| Odell Creek | 0.0 | 0.0 | 0.0 | 0.0 |
| Crescent Creek | 0.0 | 0.0 | 0.0 | 0.0 |
| Little Odell | 0.0 | 0.6 | 0.6 | 0.6 |
| Walker Rim | 0.0 | 2.4 | 0.0 | 0.0 |
| 5825 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | |
| Little Deschutes River A | 0.0 | 0.0 | 0.0 | 0.0 |
| Little Deschutes River B | 0.0 | 0.0 | 0.0 | 0.0 |
| ***Little Deschutes River*** | ***0.0*** | ***0.0*** | ***0.0*** | ***0.0*** |
| | | | | |
| Railroad | 0.0 | 1.7 | 1.2 | 1.2 |
| Walker Mountain | 0.0 | 1.4 | 0.7 | 0.7 |
| 9751 | 0.0 | 1.1 | 1.1 | 1.1 |

***Relocation of the Muttonchop Butte OGMA***

The 361-acre Muttonchop Butte OGMA would be relocated to Hemlock Butte. The management allocation for Muttonchop would be General Forest below 5,000 in elevation and Scenic Views, Partial Retention (background) above (Alternatives Considered in Detail, Chapter 2and Other Disclosures in Chapter 3). Vegetation management currently planned from the BLT EIS includes commercial thinning to reduce stocking density stress and lessen the risk of large scale loss of old forest to wide-scale disturbance processes. Thinning would favor retention of the largest trees.

[50] Personal communication with Jeff Bishop, Crescent District Assistant Fire Management Officer in charge of much of the felling of hazard trees on the District.

According to the BLT analysis, 72 of the 361 acres of the OGMA would have commercial thinning and underburning. The thinning would decrease canopy cover to 30-35 percent, which is below the 40 percent level the Crescent Ranger District uses to define goshawk nesting habitat. The area would continue to provide foraging habitat and more than 30 acres on top of the butte would be afforded Standards and Guidelines for Partial Retention which would also be likely to provide the elements for nesting habitat. Goshawk nesting capability would return to the managed stands, in approximately one to two decades when the growth of the stand increases canopy cover to 40 percent or greater.

Marten favor mixed conifer stands in the upper elevations of Muttonchop (USDA, BLT FEIS 2009). The commercial thinning activities in the BLT Project are not in an area that would have a long-term effect on marten habitat as they are situated in the ponderosa pine stands.

Relocation of 361 acres of similar and more suitable habitat for goshawk and marten would be moved to the proximity of Hemlock Butte. The area that is currently managed for General Forest (Matrix) would be changed to the Hemlock Butte OGMA. It is primarily mixed conifer dry (64 percent) and lodgepole pine. The focal species would be three-toed woodpecker, goshawk, and marten. The relocation would change marten habitat from 68 to 164 acres, three-toed woodpecker from 278 to 356 acres and goshawk from 174 to 102 acres of habitat. The amount of goshawk habitat within a disturbance zone is approximately 77 percent.

All action alternatives close roads that lead into the new Hemlock Butte OGMA. The amount of disturbed goshawk habitat changes by alternative and would be discussed in the following section.

***Designation of Routes***
All action alternatives would prohibit motorized travel off of designated routes, which includes travel on Maintenance Level 1 roads.

## Effects Associated with Individual OGMAs

**Odell Creek OGMA**
**All Action Alternatives**
Action alternatives close 0.4 miles of Maintenance Level 2 roads in this OGMA. Also, there are no designated motorized trails proposed. However, a short portion of utility maintenance road for a shared route would be designated to connect the west side of the Junction area east of the highway and to Maintenance Level 2 roads on Royce Mountain.

***Focal Species Habitat***
Habitat for the three-toed woodpecker would not be affected by within this OGMA.

***Species Diversity***
For species dependent on late and old structure, there would a reduction of the amount of the OGMA within a disturbance zone. This reduction would be from 28 percent to 8 percent along the edges where roads are adjacent to the boundary, which would increase the ability of this OGMA to provide for species dependent on late and old structure.

**Crescent Creek OGMA**
**All Action Alternatives**
In this OGMA, 0.79 miles of Maintenance Level 2 roads would be closed. There would be approximately two miles of road remaining within the boundary, one mile of which is the Crescent Cutoff Road (County Road 61) and the remaining mile associated with a Maintenance Level 2 road. There are no designated shared use routes or trails proposed within this OGMA.

***Focal Species***
There would be no change in available habitat for marten and three-toed woodpecker.

For goshawk, the action alternatives reduce the amount of habitat within the disturbance zone from 57 percent to 41 percent, increasing the effectiveness of this OGMA to provide habitat for the goshawk. As a result, the undisturbed habitat would increase from 86 acres to 119 acres.

***Species Diversity***
For species that depend on late and old structure, all action alternatives would decrease the amount of the OGMA within a disturbance zone from 66 to 52 percent. As a result, the undisturbed habitat would increase from 330 acres to 469, increasing the ability of the OGMA to provide for species dependent on late and old structure.

**Little Odell OGMA**
**Alternative B**
In addition to designation the alternative proposes to close the 180 and 150 along the eastern boundary. Although not within the boundary it influences the amount of the OGMA with a disturbance zone. There are no proposed OHV trails in this OGMA.

***Focal Species***
There would be no change in habitat for marten and three-toed woodpeckers.

***Species Diversity***
For species dependent on late and old structure, Alternative B reduces the amount of this OGMA within a disturbance zone from 34 to 21 percent. As a result, there would be an increase in undisturbed habitat from 119 acres to 274 acres, increasing the ability of this OGMA to provide for species dependent on late and old structure.

**Alternatives C, D, E**
These three alternatives would change the use of the roads adjacent to this OGMA. The railroad Maintenance Level 2 road is proposed as a shared use road, providing access to the various OHV trails. These alternatives also propose converting the 150 road into an OHV trail. While the type of use changes, it does not change disturbance zones, with approximately 66 percent of the OGMA outside of a disturbance zone.

**Walker Rim OGMA**
All action alternatives would close 9 miles of unclassified road and 1.2 miles of Maintenance Level 1 road for a total 10.2 miles. Alternatives C, D, and E close an additional four miles of Maintenance Level 2 roads for a total 14.2 miles. Alternative C proposes a more extensive trail system and would convert an additional 1.8 miles of Maintenance Level 2 road into a trail and make another two miles of Maintenance Level 2 into a shared use route. In addition, Alternative C would construct approximately 0.9 miles of trail within this OGMA to connect trails to roads converted to trail. This is the only OGMA and the only alternative that construct new trails within the OGMA.

***Focal Species***
Habitat for the three-toed woodpecker and marten would not change.

All action alternatives reduce the amount of goshawk habitat within a disturbance zone from 48 percent to 14 percent in Alternative B, 15 percent disturbed habitat in D and E, and 21 percent in Alternative C. This results in an increase in undisturbed habitat from 578 to 946 acres in Alternative B, 957 in Alternatives D and E, and 875 acres in Alternative C.

***Species Diversity***
For species dependent on late and old structure, the alternatives reduce the amount of the OGMA within a disturbance zone. In Alternatives B, D, and E the change is from 66 to 26 percent of the OGMA, and Alternative C slightly less from 66 to 33 percent. The amount of the OGMA outside of a disturbance zone changes from 644 acres to 1,421 in Alternatives B, D, and E; and from 644 to acres to 1299 in Alternative C. All action alternatives increase the ability for the OGMA to provide for species dependent on late and old structure.

**5825 OGMA**
**Alternative B**
In addition to closure 0.2 miles of Maintenance Level 1 road to motorized travel, 0.1 miles user-created trail would be rehabilitated.

***Focal Species***
Habitat for the three-toed woodpecker and marten would not change.

***Species Diversity***
For other species that depend on late and old structure, Alternative B would reduce the amount of disturbed habitat from 40 to 28 percent. The amount outside of a disturbance zone would increase from 188 to 227 acres, increasing the ability of this OGMA to provide for species dependent on late and old structure.

**Alternatives C, D, E**
Within this OGMA all roads would be closed and 0.1 miles of user-created trail would be rehabilitated.

***Focal Species***
Habitat for the three-toed woodpecker and marten would not change and access to the OGMA would be reduced. The OGMA would continue to provide for the three-toed woodpecker and marten.

***Species Diversity***
For other species that depend on late and old structure, the action alternatives would reduce the amount of disturbed habitat from 40 to 12 percent. There would be an increase of habitat not within a disturbance zone from 188 to 276 acres, increasing the ability of this OGMA to provide for species dependent on late and old structure.

**Little Deschutes River OGMA**
**Alternative B**
Within this OGMA, in addition to the 0.4 miles of Maintenance Level 1 roads to be closed, 0.8 miles of user-created trail would be rehabilitated, and 0.2 miles of Maintenance Level 1 road (080) would be converted to OHV trail to connect to trails leading to the railroad crossing.

***Focal Species***
Alternative B would reduce the amount of goshawk habitat that would be within a disturbance zone from 93 to 70 percent. This would result in an increase in undisturbed habitat from 3 acres to 18 out of 60 acres of goshawk habitat. Even with this increase it is not likely to provide for all life needs of a goshawk until the overall tree canopy percentage becomes 40 percent.

***Species Diversity***
For other species that depend on late and old structure, Alternative B would reduce the amount of disturbed habitat from 96 to 73 percent. The result would be an increase of habitat outside of a

disturbance zone from 10 to 70 acres increasing the ability of this OGMA to provide for species dependent on late and old structure.

**Alternatives C, D, E**
In addition to the actions proposed in Alternative B, Alternatives C, D, and E would close an additional 0.8 miles of Maintenance Level 2 road.

***Focal Species***
The additional road closure is not in goshawk habitat and effects would not be any different than as expressed in Alternative B.

***Species Diversity***
For other species that depend on late and old structure, the additional road closure in Alternatives C, D, and E would reduce the amount of disturbed habitat from 96 to 57 percent. The result would be an increase of habitat outside of a disturbance zone from 10 to 111 acres, increasing the ability of this OGMA to provide for species dependent on late and old structure.

**Railroad OGMA**
**All Action Alternatives**
Within this OGMA, in addition to 1 mile of Maintenance Level1 road that would be closed, 2.4 miles of user-created trail would be rehabilitated. While the differing amounts of Maintenance Level 2 roads become part of the trail system as shared routes. Those actions would have not effect on habitat for the three-toed woodpecker.

***Focal Species***
Habitat for the three-toed woodpecker would not change.

***Species Diversity***
Actions outside of the OGMA influence the amount of disturbed habitat. A high density of motorized trails in close proximity to the OGMA increases the amount of disturbed habitat.

For other species that depend on late and old structure, Alternatives C, D, and E would reduce the amount of disturbed habitat from 75 to 74 percent. The result would be a minor increase of habitat outside of a disturbance zone from 136 to 142 acres, slightly increasing the ability of this OGMA to provide for species dependent on late and old structure.

Alternative B proposed trails adjacent to this OBMA increases slightly the amount of the OGMA within a disturbance zone from 75 to 76 percent. This reduces the amount of undisturbed habitat from 136 to 132 acres.

The concentration of north/south designated routes adjacent to the OGMA plus the railroad result in a relatively high amount within disturbance zones. It is not likely to provide for a diversity of species that depend on late and old structure.

**9751 OGMA**
**All Action Alternatives**
In addition to the 1.7 miles of Maintenance Level 1 roads to be closed, 1.4 miles of user-created trail would be rehabilitated and one mile of Maintenance Level 2 road would become shared use. Actions outside of the OGMA also influence the amount of this OGMA within a disturbance zone. All the alternatives propose varying amounts of trails adjacent to the OGMA. Alternative B proposes trails to the north or the 9751 OGMA. Alternative C proposes trails to the south of the OGMA, and Alternative D

and E propose trails north and south of the OGMA. For more detail, reference the Action Alternative maps in Chapter 2.

***Focal Species***
Habitat for the three-toed woodpecker would not change.

Alternatives B, D, and E would reduce the amount of goshawk habitat within a disturbance zone from 85 to 52 percent. The resulting increase in undisturbed habitat from 36 acres to 117 results in an improvement in the ability of this OGMA to provide for the goshawk.

Alternative C has fewer trails adjacent to this OGMA where the disturbance zone overlaps goshawk habitat. It would reduce the amount of goshawk habitat within a disturbance zone from 85 to 48 percent. There would be an increase in undisturbed habitat from 36 acres to 128 acres, increasing the ability of this OGMA to provide for goshawk.

***Species Diversity***
For late and old dependent species, Alternatives B and C reduce the amount of the OGMA within a disturbance zone from 87 to 50 percent. The result would be an increase in the amount of undisturbed habitat from 69 acres to 260 acres, increasing the ability of the OGMA to provide for species dependent on late and old structure.

Alternatives D and E reduce less of the OGMA within a disturbance zone than Alternatives B and C. These alternatives reduce the amount from 87 to 55 percent, resulting in an increase in undisturbed habitat from 69 to 238 acres. The increase improves the ability of the OGMA to provide for the species dependent on late and old structure.

**Walker Mountain OGMA**
In addition to Alternatives B, D, and E closure of 5.2 miles of Maintenance Level 1 road, they would convert 1.46 miles of road along the boundary into a trail. Although this does not account as “within” the Designated Old Growth area, the associated effects of disturbance were accounted. Alternative C would close 1.5 miles of Maintenance Level 1 road and convert 1.46 miles of Maintenance Level 1 road along the boundary into a trail and convert three additional miles of Maintenance Level 1 road through the western side of the OGMA into a trail. In addition, approximately 0.1 mile of new trail would be constructed to connect a trail outside the OGMA to the converted road.

***Focal Species***
Habitat for the three-toed woodpecker and marten would not change.

Alternatives B, D, and E would reduce the amount of the disturbed habitat from 33 to 17 percent. There would be an increase in the amount of undisturbed habitat from 505 acres to 632 acres, increasing the ability of the OGMA to provide for goshawk.

The reduction of disturbed habitat is not as high in Alternative C. This alternative would reduce the amount of goshawk habitat within a disturbance zone from 33 to 30 percent. There would be an increase from 505 acres to 527 acres of undisturbed habitat, increasing the ability of the OGMA to provide for goshawk.

***Species Diversity***
For species dependent on late and old structure, Alternatives B, D, and E would reduce the amount of the OGMA within a disturbance zone from 55 to 27 percent. There would be an increase from 871 acres to

1,414 acres outside of a disturbance zone. The ability of this OGMA to provide for species dependent on late and old structure would increase with the implementation of Alternative B, D, or E.

Alternative C with its more extensive trail system has an overall reduction in the amount within disturbance zone to a lesser degree. The amount is reduced from 55 to 46 percent. There is an increase from 871 acres to 1,040 acres outside of a disturbance zone.

The following Table 94 is a summary of effects within the Old Growth Management Areas within the project area by alternative:

**Table 94. Summary of Activities within the Old Growth Area by Alternative**

| Old Growth Management Area | Miles of Roads to be Closed | Miles of User-created Trails to be Closed and Rehabilitated | Designation of Existing Road for Shared Use or Trail |
|---|---|---|---|
| Odell Creek | 0.4 | 0.0 | 0.0 |
| Crescent Creek | 0.8 | 0.0 | 0.0 |
| Little Odell | Closes roads along boundary; none inside OGMA. | 0.0 | Alts. C, D, and E 0.6 |
| Walker Rim | Alt. B 10.2; Alts C, D, and E 14.2 | 0.0 | All 3.8; Alt. C constructs 0.9 miles of new trail |
| 5825 | Alt. B 0.2; Alts. C, D, and E 0.6 | 0.1 | 0.0 |
| Little Deschutes River | 0.4 | Alt. B 0.8; Alts C, D, and E 1.6 | Alt B 0.8; Alts. C, D, and E 0.0 |
| Railroad | 1.0 | 2.4 | Alt C 1.7; Alts. D and E 1.2 |
| Walker Mtn. | Alts B, D, E 5.2; Alt C 1.5 | 0.0 | Alt. C 3.0; Alts. B, D and E 0.0 |
| 9751 | 1.7 | 1.4 | 1.1 |
| **Total** | **Alt. B 19.9; Alt. C 20.6; Alts. D and E 24.3** | **Alt. B 4.7; Alts. C, D, and E 5.5** | **Alt. B 5.7; Alt. C 6.4; Alts. D and E 2.9** |

## Cumulative Effects

Table 11 was reviewed for projects that overlap within in time and space and have the capability to create a cumulative effect. The zone of influence was defined as the 93,016 acre project area.

Foreseeable actions that overlap the OGMAs include implementation of the BLT FEIS (Record of Decision, 2009). The purpose of the actions is to lessen the risk of large scale loss of old forest to wide-scale disturbance processes through vegetative manipulation and fuels reduction activities. Vegetative prescriptions in overlapping OGMAs include variable density thinning that reduced canopy cover to 20-30 percent. High density patches remained in passively managed areas ranging from 3-14 acres for each activity unit. Snags and down wood were retained. Approximately 438 acres of activities are scheduled for the four OGMAs within the BLT project area. Of the 438 acres, 214 acres would occur in the Little Odell OGMA, 6 acres in the 5825 OGMA, and 146 acres on the Little Deschutes River OGMA.

Overall, planned activities would reduce goshawk nesting habitat to foraging. The remaining habitat within the OGMA would be managed with a passive management scenario, as well as habitat outside the

OGMAs would provide for nesting habitat and additional foraging. Reference the full discussion in the goshawk analysis in the Management Indicator Species section.

Roads proposed closed and converted to trails adjacent to the OGMA by the Three Trails OHV project would be delayed until the BLT project is completed within the next 2-3 years; therefore they are not considered a cumulative effect.

The Rim-Paunina EIS analysis would be completed in spring 2011. Proposed activities use silvicultural treatments on approximately 10,000 acres to provide a diversity of habitats for Management Indicator Species more in line with historical conditions to maintain and enhance existing late- and old-structured stand characteristics. It also would apply prescribed fire on 13,000 acres to fire-dependent ecosystems to create habitat conditions that allow fire to perform its natural ecological function and more closely mimic natural processes that maintain white-headed woodpecker habitat and other dependent wildlife species. Some of these activities overlap the Walker Mountain OGMAs which total approximately 3,800 acres. The maximum amount of activities proposed include up to 57 acres of commercial thinning in the Little Deschutes OGMA; 70 acres of commercial harvest and 20 acres of prescribed underburning in ponderosa pine in the Railroad OGMA; 230 acres of commercial harvest and 1,080 acres of small diameter thinning, and prescribed underburning in Walker Mountain OGMA; and 743 acres of commercial thinning and 390 acres of small diameter thinning and prescribed underburning in the Walker Rim OGMA. It also includes up to 40 acres of aspen stand enhancement.

Activities would increase white-headed woodpecker habitat, which is limited on the Crescent Ranger District. It would decrease the amount of goshawk nesting habitat, but enhance foraging habitat. Activities within marten habitat is limited to those that do not considerable alter habitat such as non-mechanical small diameter thinning and prescribed underburning. There may be some temporary mechanical disturbance associated with implementation of the Rim-Paunina Project. Those effects would be considered temporary (less than five years) and are more than offset by the increase of undisturbed habitat created by road closures in the Three Trails OHV Project. For a more detailed analysis of the effects of the Three Trails OHV project on goshawks and marten, refer to the MIS section in Chapter 3.

Implementation of the 2007 Five Buttes EIS is currently on hold due to the judicial process. It focuses on reducing risk from natural disturbance process such as insects, disease, and wildfire by strategic thinning and fuel reduction activities to reduce risk of large-scale loss of forest, particularly the largest trees. Approximately 97 acres of activities overlap a portion of Crescent Creek OGMA. Of those acres, approximately 10 acres would be commercially thinned to reduce the density of trees in a ponderosa pine stand. The objective is to facilitate movement to its desired long-term condition which is a single story late- and old-structured ponderosa pine stand. The remaining 87 acres would remove small diameter trees of six inch diameter or less. The Five Buttes analysis discloses: “Because this OGMA was designated for the northern goshawk, a mix of densely forested areas with large tree diameters is desired for nesting stands and more along with open stands in close proximity to provide foraging opportunities. Nesting and foraging habitat is provided in this 970 acre OGMA and thinning and post-sale activities would not affect the ability of the OGMA to function for goshawks as designated.” These activities would allow goshawks more foraging area and greater ease in pursuing prey species. The timing of these activities would not affect the proposed road closures within the OGMA in the Three Trails OHV project because implementation would not overlap. Therefore the analysis related to habitat disturbances zone is as disclosed in the direct and indirect effects.

Also, a portion of the Crescent Creek Wild and Scenic River corridor overlaps the Crescent Creek OGMA. Currently, interim Wild and Scenic Standards and Guidelines for (MA 17) are in place. These include specific direction for cutting of trees and protection of Outstandingly Remarkable Values (ORV) which include vegetation and scenery. A management plan is being drafted that includes wildlife habitat

as an additional ORV. Both Standards and Guidelines from the Wild and Scenic River as well as the Old Growth Management Area pertain. If they conflict, the more restrictive would apply. Therefore, there are no cumulative effects associated with the Crescent Creek Wild and Scenic River Plan.

The Travel Management DEIS proposes changes to motorized use on both National Forests and the Grasslands. The decision to be made includes designating use on roads and prohibiting travel on cross-country travel and Maintenance Level 1 roads. It is anticipated the implementation would be in 2011. Regardless, the Three Trails OHV project would close additional roads than proposed under the Deschutes/Ochoco Travel Management EIS, which would result in additional undisturbed habitat as described in this Three Trails OHV project. This change will be reflected in the Final EIS. Therefore, the effects described under direct and indirect effects in this document do not change.

There are no other past, present, or foreseeable actions identified that overlap the OGMAs in space or time.

**Consistency with the Forest Plan**

Overall, the Three Trails OHV Project reduces the density of roads in Old Growth Management Allocations. All action alternatives do not have any staging areas, campgrounds, or trailheads considered concentrated use and it is defined in the Forest Plan (Forest Plan, Intensive Recreation, page 4-135 "….Generally, high concentrations of visitors will occur around developments"). Use of a designated trail system, regardless of motorized or non-motored use is considered dispersed and it is described in the Forest Plan (Forest Plan, page 4-4, "…Activities which disperse recreation throughout the forest include nordic skiing, river rafting, mountain bicycling, and off-highway vehicle use)." Therefore, all action alternatives are consistent with M15-1 and M15-3 which allow dispersed use of OHVS and prohibit concentrated use associated with developments such as staging areas and campgrounds.

The proposed activities in the action alternatives close an amount of roads ranging from 16-27 miles. These roads would be allowed to revegetate naturally. Therefore, all action alternatives are consistent with M15-14 which calls for the minimum standard and density of roads.

The Three Trails OHV Project is consistent with the goals of MA-15 Old Growth because it provides naturally evolved old growth forest ecosystems for:

**(1)** ***Habitat for plant and animal species associated with old growth forest ecosystems*****:**
The Three Trails OHV project does not alter OGMA from providing late and old structure stands for habitat for focal species, or limit diversity of species dependent on late and old structure. Except for Alternative C and 0.89 miles of user-created trail adopted as a route, all other routes are on existing Maintenance Level 1 and 2 roads. No other vegetation would be removed; therefore habitat for plant species associated with old growth systems would not change.

**(2)** ***Representations of landscape ecology:***
There would be no change to the current representations of landscape ecology.

**(3)** ***Public enjoyment of large, old tree environments:***
There would be no vegetative changes or effect to large trees associated with the action alternatives.

***(4) The needs of the public from an aesthetic spiritual sense:***
Visitors to an Old Growth area to seek an aesthetic and spiritual experience usually gain access by a road and use a motor vehicle in one form or another. This access can also potentially affect aesthetic and spiritual values. Although the Three Trails OHV project designates dispersed access in the form of roads and trails (motorized routes) of up to 8.46 miles, it offsets the potential effect by closing a range of 16-27 miles of currently open roads. Public enjoyment to these areas is maintained through a lower level of access.

## Davis Late-Successional Reserve

The Davis Late-Successional Reserve (LSR) is 48,900 acres and is located east of the Oregon Cascade crest on the Crescent Ranger District of the Deschutes National Forest. This area was designated by the 1994 Northwest Forest Plan as part of a network of late-successional and old growth forest ecosystems that would serve as habitat for late-successional and old growth related species such as the northern spotted owl. These LSRs are designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem (NWFP ROD p. C-11).

The Late-Successional Reserve Assessment provides guidance, goals, and objectives based on the Northwest Forest Plan (NWFP), to manage, protect, and enhance conditions of late-successional and old-growth forest ecosystems, but responds to the unique condistions of the Davis LSR. The original Davis Late Successional Reserve Assessment (LSRA) was prepared by district personnel in 1995, and updated in 2007 following the Davis Fire of 2003. Approximately 7,303 acres of the 48,900 acre Davis Late Successional Reserve (LSR) extends into the Three Trails OHV project area in the vicinity of Royce Mountain.

Direction from the NWFP that applies to the Three Trails OHV Project include the following:

**Road Construction and Maintenance**

"Road construction in Late-Successional Reserves for silviculture, salvage, and other activities generally is not recommended unless potential benefits exceed the costs of habitat impairment. Road maintenance may include felling hazard trees along rights of way" (NWFP ROD, S & G p. C-16 1994).

**Developments**

"Development of new facilities that may adversely affect Late-Successional Reserves should not be permitted." …. "Existing developments in Late-Successional Reserves such as campgrounds, recreation residences, ski areas, utility corridors, and electronic sites are considered existing uses with respect to Late-Successional Reserve objectives, and may remain, consistent with other standards and guidelines. Routine maintenance of existing facilities is expected to have less effect on current old-growth conditions than development of new facilities. Maintenance activities may include felling hazard trees along utility rights-of-way, trails, and other developed areas" (NWFP ROD S & G p. C-17 1994).

### Analysis Methods, Units of Measure and Assumptions

This analysis will look at the affects of the project on the land within the allocation to meet direction outlined in the NWFP and the Davis LSRA.

### Analysis Included

In this analysis open road densities as measured by miles per square mile of area (mi/mi$^2$), of those roads Maintenance Level 2 (ML) and above, for MSA AA, BB and W will be the metric used. The other Management Strategy Areas (MSAs) have proportionately fewer acres within the project area and miles of roads closed will be discussed.

### Analysis Not Included

***Effects on wildlife species*** **–** The analysis of the project on the northern spotted owl, habitat and critical habitat is in the TES section in Chapter 3. The analysis of the project on black-back woodpeckers is included in the MIS section in Chapter 3.

***Development of New Facilities*** - There are no new developments, facilities[51] or roads proposed in the Davis LSR in accordance with management direction (NWFP ROD p.C-17).

***New Trails*** – There are no new construction of trails proposed within the Davis LSR. Proposed trails are on existing roads or existing trails and will be designated in accordance with management direction. There will be no off-road OHV travel allowed in Three Trails OHV project area (NWFP-ROD p. C-17; LSRA p. 117).

**Existing Condition**

The Davis LSRA is divided up into twenty-eight Management Strategy Areas (MSAs) based on existing habitat conditions and guides management decisions based on land capability. Some MSAs are capable of providing northern spotted owl habitat while others were designed to emphasize other species or guilds such as black-backed woodpeckers, great gray owls, or bald eagles. There are seven MSAs that partially or completely overlap the Three Trails OHV Project Area (Table 95). They include MSA L, V, W, Y, Z, AA and BB. MSAs L, Y, and Z are predominately lodgepole, lodgepole/mixed conifer riparian for black-backed woodpecker and/or riparian species and generally provide connectivity for northern spotted owls. MSAs V, W, AA, and BB are predominately mixed conifer that potentially provide habitat for the northern spotted owl.

Small portions of MSAs L, Y, and Z make up 330 acres of the LSR portions of Three Trails OHV project area. Within the project area they are predominately mixed conifer with lodgepole pine. Small portons of MSA V, and W, and MSA AA, and BB in their entirety make up the remaining 6,974 acres of the LSR portion of Three Trails OHV project area. These MSAs are predominately mixed conifer to provide habitat for the northern spotted owl. Table 95 shows the entire acreage and square miles of the seven Management Strategy Areas (MSA) as well as the acres, square miles, and percentage of each that are in the Three Trails OHV project area.

**Table 95. Management Strategy Areas in the Three Trails OHV Project Area**

| MSA | Total Acres | Square Miles | Acres in Three Trails OHV Project Area | Square Miles | Percentage of Acres in Three Trails OHV Project Area |
|---|---|---|---|---|---|
| Davis LSR | 48,900 | 76.4 | 7,303 | 11.4 | 15% |
| AA | 369 | 0.6 | 369 | 0.6 | 100% |
| BB | 4,872 | 7.6 | 4,872 | 7.6 | 100% |
| L | 2,148 | 3.4 | 27 | N/A | 1% |
| V | 3,011 | 4.7 | 187 | 0.3 | 6% |
| W | 1,826 | 2.8 | 859 | 1.3 | 47% |
| Y | 2,418 | 3.8 | 874 | 1.4 | 36% |
| Z | 699 | 1.1 | 117 | 0.2 | 17% |

In addition to the Northwest Forest Plan direction, the Davis Late-Successional Reserve Assessment (LSRA) also guides management within the LSR. The Davis LSRA (2007) includes the following guidelines:

**Travel and Access Management**

"Off road/trail use would be considered detrimental to the LSR" (LSRA p. 70).

[51] Facilities include staging areas, campgrounds, viewpoints, and OHV bridge construction

> "All winter and summer motorized access is to be on designated routes (only) by the year 2013. No additional trails are to be created…" (LSRA p. 117).

The Davis LSRA provides density recommendations for target open road density (those roads that are open and available for use), and total road density (total miles of open and closed). Example: A road that changed from a Maintenance Level 2 (maintained for high clearance vehicles) to a Maintenance Level 1 (closed road) would reduce the open road density or a road that is decommissioned would reduce the total road density. There would be no roads decommissioned in the Davis LSRA for this project. The recommendations are for the LSR overall and by each management strategy area (MSA).

> ***The target "open road" density:***
> Overall open road density of the LSR is not to exceed 1 mi/mi² with no single MSA exceeding 1.5 mi/mi². The exceptions would be in those MSAs where road densities cannot be reduced to 1.5 mi/mi² due to the size of the MSA and the number of major roads in them that cannot be closed.
>
> ***The target "total road" or "objective" density:***
> Overall, total road density of the LSR is not to exceed 2.0 mi/mi², with no single MSA exceeding 2.5 mi/mi². The exception would be those smaller MSAs (identified in a roads analysis) where major roads and those closed (Maintenance Level 1) make further reductions not feasible. A factor that should be considered is access on closed roads for potential fire suppression actions.

Table 96 displays the road densities for the MSAs from the Davis LSR Assessment where the objective is based on all roads classified as Maintenance Level 2 and above. Operational roads are those roads that were in use regardless of maintenance level at the time the LSRA was written.

***Environmental Consequences***

**Alternative A**

There would be no change to current management with the implementation of this alternative. There would be no roads closed. Existing condition would continue as described until the Travel Management Rule would be implemented on the Deschutes National Forest. It also assumes motorized travel is occurring on closed roads and user-created trails in the project area.

Only Management Strategy Areas (MSA) AA and BB are entirely within the project area. The following table shows the miles of road by maintenance level in each MSA and the portion within the project area. Only MSA Y meets the Davis LSRA target of 1.5 miles of road per square mile of land base. The rest of the MSAs exceed the target. There are very few roads within the project area that contribute to the overall road densities within MSA L, V, Y and Z. Alternative A would not close any roads. Existing use on Maintenance Level 1 roads would continue and road densities in MSA AA, BB and W would remain high.

Future use of Maintenance Level 1 roads would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest.

**Table 96. Road Densities by Management Strategy Areas**

| Davis LSR | | | Miles of Road by Maintenance Level (M/L) | | | | | |
|---|---|---|---|---|---|---|---|---|
| **MSA** | **Total MSA Area in Mile²** | **Total MSA and the portion within Three Trails OHV Project Area** | **M/L 1 BASIC CUSTODIAL CARE (CLOSED)** | **M/L 2 HIGH CLEARANCE VEHICLES (OHV )** | **M/L 3, 4, 5 PASSENGER CARS LOW TO HIGH USER COMFORT** | **Total Miles** | **Open Roads (ML2+)** | **Open Road Density Mi/Mi²** |
| AA | 0.6 | Total | 1.0 | 0.8 | 0.6 | **2.4** | 1.4 | 2.4 |
| | | Within Three Trails | 1.0 | 0.8 | 0.6 | **2.4** | | |
| BB | 7.6 | Total | 18.0 | 16.0 | 1.1 | **35.1** | 17.1 | 2.2 |
| | | Within Three Trails | 18.0 | 16.0 | 1.1 | **35.1** | | |
| L | 3.4 | Total | 4.3 | 3.8 | 2.8 | **10.9** | 6.6 | 2.0 |
| | | Within Three Trails | 0.02 | 0.0 | 0.0 | **0.0** | 0.0 | N/A |
| V | 4.7 | Total | 11.9 | 12.1 | 2.2 | **26.2** | 14.3 | 3.0 |
| | | Within Three Trails | 0.2 | 1.0 | 0.3 | **1.5** | 1.3 | N/A |
| W | 2.8 | Total | 12.5 | 4.5 | 0.9 | **17.9** | 5.4 | 1.9 |
| | | Within Three Trails | 3.9 | 2.3 | 0.8 | **7.0** | 3.1 | N/A |
| Y | 3.8 | Total | 2.6 | 3.3 | 0.0 | **6.0** | 3.3 | 0.9 |
| | | Within Three Trails | 0.6 | 0.6 | 0.0 | **1.3** | 0.6 | N/A |
| Z | 1.1 | Total | 2.9 | 1.3 | 2.3 | **6.5** | 3.6 | 3.3 |
| | | Within Three Trails | 0.6 | 0.1 | 0.4 | **1.1** | 0.5 | N/A |

**Effects Common to All Action Alternatives (B, C, D, and E)**

There are no new facilities planned within the Davis LSR including, no staging areas or campgrounds. The proposed OHV trails would be on existing roads, utility maintenance roads, horse trail, or snowmobile trail. Viewpoints are existing open areas on roads. There is no enhancement of these viewpoints proposed.

The Junction high density area around the Crescent Sno-Park would access the eastern portion of Crescent Lake Junction and the Maintenance Level 2 roads on Royce Mountain and beyond through designating the snowmobile trail/Metolius-Windigo Trail through the snowmobile underpass onto the powerline maintenance road and then connect to the 5800930 road. No new trail would be constructed.

All action alternatives are the same inside the LSR. They all propose to change 0.8 miles of Maintenance Level 2 road to Maintenance Level 1 in MSA AA and 4.9 miles of Maintenance Level 2 to Maintenance Level 1 in MSA BB. Thus, the Three Trails OHV project would reduce road densities in MSA AA below the target level from 2.4 to 1.1 mi/mi², moves MSA BB toward the target level from 2.3 to 1.6 mi/mi². It would raise the road densities in MSA W from 1.9 to 2.0 mi/mi because the action alternatives propose to close 0.4 miles of Maintenance Level 2 roads and to open 0.6 miles of a closed road (Maintenance Level 1) to a Maintenance Level 2 in order to provide a through Maintenance Level 2 route outside to the north of the district. The results increase open road densities within MSA W by 0.1 miles. There are very few roads within the project area that contribute to the overall road densities within MSA L, V, Y and Z, thus there would be no change in the action alternatives. Overall, the action alternatives reduce open road densities moving MSA AA to target levels and MSA BB toward target goals.

Future use of Maintenance Level 1 roads would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest.

Table 96 shows the miles of roads by maintenance level and the changes in open road densities with the Three Trails OHV project area.

**Table 97. Changes to Road Densities by Management Strategy Areas**

| | | Miles of Road by Maintenance Level | | | | | |
|---|---|---|---|---|---|---|---|
| **MSA** | **Total MSA and the CHANGES within Three Trails OHV Project Area** | **M/L 1 - BASIC CUSTODIAL CARE (CLOSED)** | **M/L 2 - HIGH CLEARANCE VEHICLES** | **M/L 3, 4, 5 PASSENGER CARS LOW TO HIGH USER COMFORT** | **Total Miles** | **Open Roads (ML2+)** | **Open Road Density Mi/Mi²** |
| AA | Total | 1.0 | 0.8 | 0.6 | 2.4 | 1.4 | 2.4 |
| | Three Trails Changes | +0.8 | -0.8 | 0.0 | 0.0 | N/A | N/A |
| | **New Total** | **1.8** | **0.0** | **0.6** | **2.4** | **0.6** | **1.0** |
| BB | Total | 18.0 | 16.0 | 1.1 | 35.1 | 17.1 | 2.2 |
| | Three Trails Changes | +4.9 | -4.9 | 0.0 | 0.0 | N/A | N/A |
| | **New Total** | **22.9** | **11.2** | **1.1** | **35.1** | **12.3** | **1.6** |
| W | Total | 12.5 | 4.5 | 0.9 | 17.9 | 5.4 | 1.9 |
| | Three Trails Changes | -0.2 | +0.2 | 0.0 | 0.0 | N/A | N/A |
| | **New Total** | **12.3** | **4.7** | **0.9** | **17.9** | **5.6** | **2.0** |

**Cumulative Effects**

Table 11 was reviewed for projects with the potential for additive effects that overlap within in time and space with the Three Trails OHV project. The zone of influence was defined as the 93,016 acre project area. Three Trails OHV project does not propose to remove or modify any spotted owl habitat. Cumulative effects were considered on only those projects that overlap with the Three Trails OHV project area and alter road densities.

Five Buttes EIS (2007), currently in the judicial system, has units that are within the Three Trails OHV project area and would temporarily alter road densities. Roads would be reopened and temporary roads constructed for Five Buttes timber harvest access to units on Royce Mountain and Odell Butte. It is unknown if it would delay achieving the road densities described in this document or temporarily increase them. In either case, the temporary roads[52] and those Maintenance Level 1[53] roads used for sales would only be needed for the life of the project estimated at 2-3 years. Upon project completion, the temporary roads would be closed and sub-soiled eliminating the temporary disturbance associated harvest activity and log hauling. Maintenance Level 1 roads would also be signed closed. There are no known additive effects associated with the Five Buttes proposed units and temporary roads; therefore, there would be no cumulative effects.

The Deschutes and Ochoco National Forest have prepared a joint Environmental Impact Statement (EIS) to implement the Travel Management Rule. The document designates motorized use on both National Forests and the Grasslands. The decision to be made includes designating use on roads and prohibiting cross-country travel and travel on Maintenance Level 1 roads. It is anticipated the implementation of the

[52] Temporary roads are built to low standards and not intended for mixed use.
[53] ML1 roads would be available for administrative/timber contract work and not available to the public.

plan in central Oregon would be in January 2011. Regardless, the Three Trails OHV project would close additional roads than proposed under the Deschutes/Ochoco Travel Management EIS, which would result in an additional reduction in road densities within the MSAs located in Three Trails OHV project area. This change will be reflected in the Final EIS. Therefore, the effects described under direct and indirect effects for this document do not change.

**Consistency with the Forest Plan**
Overall, the Three Trails OHV Project reduces the density of roads in the Davis Late-Successional Reserve. All action alternatives do not have any staging areas, campgrounds, or new trail construction with the LSR, thus Three Trails OHV is consistent with the Forest Plan and the Davis LSRA.

*"Road construction and Maintenance – Road construction in Late-Successional Reserves for silviculture, salvage, and other activities generally is not recommended unless potential benefits exceed the costs of habitat impairment. Road maintenance may include felling hazard trees along rights of way." (NWFP ROD p.C-16 1994)*

Three Trails does not propose any road construction. Three Trails OHV project is consistent with C-16 of the NWFP.

*"Developments – Development of new facilities that may adversely affect Late-Successional Reserves should not be permitted." (NWFP ROD p.C-17 1994)*

Three Trails OHV project does not propose the development of any new trail, staging areas, or campgrounds. Existing viewpoints are open areas along existing roads and there are no proposals to improve or enhance those viewpoints. Proposed trail from the Junction Sno-Park to the 930 road crosses into the LSR on the existing snowmobile/Metolius-Windigo Trail and the utility access road. No new construction of trail is proposed. The Three Trails OHV project is consistent with NWFP.

*Travel and Access Management - "Off road/trail use would be considered detrimental to the LSR" (LSRA p. 70). "All winter and summer motorized access is to be on designated routes (only) by the year 2013. No additional trails are to be created…" (LSRA p. 117).*

The Three Trails OHV project is designed to eliminate off-road and trail travel. OHV use would be on designated routes and all routes and trails are on currently existing roads and trails. No new trail construction would occur in the Davis LSR. The Three Trails OHV Project is consistent with the Davis LSRA.

***The target "open road" density:***
*Overall open road density of the LSR is not to exceed 1 mi/mi² with no single MSA exceeding 1.5 mi/mi². (Davis LSRA p.117)*

The Three Trails OHV project reduces the road densities in MSA AA below the target level from 2.4 to 1.1 mi/mi², moves MSA BB toward the target level from 2.3 to 1.6 mi/mi², and raises the road densities in MSA W from 1.9 to 2.0 mi/mi². The project only looked at half of MSA W and did not consider closing additional roads within MSA W to offset the increase. A decision on Three Trails OHV project does not preclude future road closures. This project takes a step toward reducing target open road densities. The Three Trails OHV Project is consistent with Davis LSRA 117

***The target "total road" or "objective" density:***
*Overall, total road density of the LSR is not to exceed 2.0 mi/mi², with no single MSA exceeding 2.5 mi/mi².*

The Three Trails OHV project does not decommission any roads, it does not move any portion of the LSR toward meeting target total road densities, and does not increase total road densities. A decision on the Three Trails OHV project does not preclude future decommissioning of roads within these Management Strategy Areas. Three Trails OHV project is consistent with Davis LSRA 117.

## Fisheries and Aquatic Resources

The following section summarizes the specialist report in its entirety. It also documents the review and findings of the Forest Service planned programs and activities for possible effects on species (1) listed or proposed for listing by the USDI Fish and Wildlife Service (USFWS) as Threatened or Endangered; or (2) designated by the Pacific Northwest Regional Forester as Sensitive. There are no anadromous species or their habit within the project area. It is prepared in compliance with the requirements of Forest Service Manual (FSM) 2630.3, FSM 2672.4, and the Endangered Species Act of 1973, as amended (ESA) (Subpart B; 402.12, Section 7 Consultation). Also, this section summarizes the analysis of the effects from implementing the action alternatives on fish populations, critical habitat and habitat for threatened bull trout (*Salvelinus confluentus*), and sensitive redband trout (*Oncorhynchus mykiss*).

In summary, there are potential beneficial effects to fisheries from implementation of the action alternatives. Moving use away from water and restoration activities result in decreases in potential for sediment delivery. Increases in vegetative recovery also improve bank instability and provide a very small increase in vegetative cover to intercept solar radiation (shade).

The following analysis addresses the potential effects of managing off-highway vehicle (OHV) use on the Crescent Ranger District on threatened, endangered, and sensitive fish species. This determination, required by the Interagency Cooperation Regulations (Federal Register, January 4, 1978), ensures compliance with the Endangered Species Act (ESA). Changes to the Region 6[54] (R6) Regional Forester's Sensitive Species List were instituted on November 28, 2000.

The following table displays the Threatened, Endangered and Sensitive (TES) species. The zone of influence for effects is bound by the headwaters of the Little Deschutes to the confluence of the Deschutes River.

**Table 98. Threatened, Endangered and Sensitive Species**

| Species | Scientific Name | Status | Occurrence | Effects Determination |
|---|---|---|---|---|
| **Aquatic Species** | | | | |
| Columbia River Bull Trout | *Salvelinus confluentus* | T | HD, D | **NE** |
| Interior Redband Trout | *Oncorhynchus mykiss* | S | HD, D | **NI** |

**Status**

| | |
|---|---|
| E | Federally Endangered |
| T | Federally Threatened |
| S | Sensitive species from Regional Forester's list |
| C | Candidate species under Endangered Species Act |
| MS | Magnuson-Stevens Act designated Essential Fish Habitat[55] |

**Occurrence**

| | |
|---|---|
| HD | **Habitat Documented** or suspected within the project area or near enough to be impacted by project activities |
| HN | **Habitat Not** within the project area or affected by its activities |

[54] Region 6 includes all of Washington State and Oregon

[55] There is no essential fish habitat in the project area because the Little Deschutes River and Crescent Creek are greater than 50 miles of an androumous fish barrier.

| | |
|---|---|
| D | Species **Documented** in general vicinity of project activities |
| S | Species **Suspected** in general vicinity of project activities |
| N | Species **Not documented** and not suspected in general vicinity of project activities |

**Effects Determinations**

Threatened and Endangered Species

| | |
|---|---|
| NE | No Effect |
| NLAA | May Effect, Not Likely to Adversely Affect |
| LAA | May Effect, Likely to Adversely Affect |
| BE | Beneficial Effect |

Sensitive Species

| | |
|---|---|
| NI | No Impact |
| MIIH | May Impact Individuals or Habitat, but Would Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species |
| WIFV | Would 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 |

Bull trout historically were present throughout the planning area, but have been reduced to the Odell drainage over the past century. The Odell Lake Bull Trout population is the last natural, adfluvial population in the state of Oregon. All known spawning occurs in Trapper Creek, a tributary to Odell Lake, though it is suspected that limited spawning may occur in Odell Creek as well. The planning area encompasses a small segment of the Odell Creek subwatershed, but lies outside of occupied bull trout habitat. Therefore the bulk of the following discussion focuses on redband trout and their habitat, the species most likely to be present within the project area with potential to be adversely affected and water quality. The proposed project would have no effect (NE) on bull trout in Odell Creek due the distance between occupied habitat and proposed activities (> than ½ mile) and a lack of surface connectivity which could result in increased fine sediment inputs. Because of the lack of surface water connectivity between proposed activities and occupied bull trout habitat, stream shade and/or temperature and turbidity/percent fines will not be affected. All proposed use within the Odell Creek Subwatershed (occupied by bull trout) occurs on an existing footprint (Metolious Windigo Trail/Utility line). Likewise, the proposed project would have no impact (NI) on R6 sensitive redband trout. Proposed project activities would not result in ground disturbing activity within 400 feet of known occupied redband trout habitat. The proposed trails would not result in a loss of stream shade or riparian vegetation or measurably increase fine sediment delivery to perennial streams or occupied fish habitat.

Currently there is no critical habitat designation for bull trout on National Forest System managed lands. The US Fish and Wildlife Service has proposed critical habitat in the vicinity at Odell Lake and Odell Creek, but not within the planning area. Final designation is expected in October of 2010. Proposed critical habitat areas are outside of the planning area and it is anticipated that action alternatives associated with the Three Trails OHV project would have No Effect on bull trout critical habitat. Additional consultation on affects to critical habitat would occur upon final designation.

## Affected Environment

The Three Trails OHV planning area lies within four fifth field watersheds; Upper Little Deschutes River, Crescent Creek, Little Walker Mountain and Wickiup, and 16 sixth field subwatersheds. ESA listed "Threatened" bull trout (*Salvelinus confluentus*) are found only within the Odell Creek subwatershed (Wickiup Watershed). The Odell Creek subwatershed is designated as a Tier 1 Key Watershed as defined by the Northwest Forest Plan. Tier 1 watersheds contribute directly to the conservation of at-risk salmonids. No other ESA listed aquatic species are present within the planning area. Bull trout were

historically found in the Crescent Creek drainage and the Little Deschutes River Basin, however they have been extirpated from both systems likely within the past half century. Redband trout are a Region 6 Sensitive species and found in the following sixth field subwatersheds: Odell Creek, Cold Creek, Lower Big Marsh Creek, Middle Crescent Creek Major water bodies within the planning area include; Little Deschutes River, Crescent Creek, Big Marsh Creek, Hemlock Creek, Basin Creek, Spruce Creek, and Cold Creek.

**Fish Distribution**

Fish species found within the planning area include Region 6 sensitive redband trout, mountain whitefish and non-native brook trout, and brown trout. A unique population of bull trout is found in the Odell Creek subwatershed, however project boundaries do not include waterways that are connected to Odell Creek by surface water. Odell Creek lies outside of the project area boundary.

**Table 99. Streams in Planning Area and Fish Species found within them.**

| Stream Name | Fish Species |
|---|---|
| Little Deschutes River | Brook Trout (SAFO), Brown Trout (SATR), possibly redband trout (ONMY) |
| Hemlock Creek | SAFO, SATR |
| Spruce Creek | SAFO, SATR |
| Rabbit Creek | SAFO |
| Basin Creek | SAFO |
| Swamp Creek | SAFO |
| Little Odell Creek | None |
| Big Marsh Creek | SAFO, SATR, ONMY |
| Crescent Creek | SAFO, SATR, ONMY |
| Cold Creek | SAFO, SATR, ONMY |

Although redband trout and bull trout were historically present in the upper Little Deschutes River drainage and Crescent Lake/Creek, redband trout, if still present; exist at a much depressed state. The most recent management plan conducted by ODFW found redband trout to be scarce within the Little Deschutes River. During sampling of the river conducted in 1992, only ten redband were found within the entire river, with only one upstream of La Pine (Upper Deschutes River Subbasin Management Plan, 1996). No redband trout were found upstream of Gilchrist.

Fish species known to currently inhabit Odell Creek include; bull trout *Salvelinus confluentus*, redband trout *Oncorhynchus mykiss* and mountain whitefish *Prosopium Williamsoni*. Largemouth bass *Micropterus salmoides* and tui chub *Gila bicolor* have been illegally introduced into Davis Lake at some time within the past century (Odell Watershed Analysis 1999). Bull trout have been recently documented in Odell Creek, with a majority of the fish being found near the confluence of cold, spring fed tributaries (Maklaks, McCord Cabin Springs, and Unnamed Tributary). It is believed that bull trout may use Odell Creek for foraging and possible spawning in cold-water tributaries (Odell Watershed Analysis 1999). Redband trout are the dominant fish species in Odell Creek. The Columbia River populations of bull trout (*Salvelinus confluentus*) were listed as a threatened species by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA) on June 10, 1998 (63 FR 31647). Bull trout historically inhabited Crescent Creek and Lake, but have been presumed extirpated from those water bodies for several decades. Redband trout are on the Regional Forester's sensitive species list.

A dam is operated at the outlet of Crescent Lake by the Tumalo Irrigation District. Irrigation water is stored in Crescent Lake through the winter months and released in the summer. Fish passage is largely nonexistent at this site. There is no fish ladder and screens are to be maintained to prevent the passage of

fish through the dam structure. However, during the fall of 2005, Forest Service personal observed several kokanee salmon and lake trout in Crescent Creek. These fish had apparently slipped beneath screens in the dam. Flow in Crescent Creek is highly modified below the dam. Winter flows from the dam to the confluence with Big Marsh Creek are often in the range of 3 to 9 cubic feet per second (cfs), while summer discharge averages about 120 cfs (Bureau of Reclamation 2004).

Native fish species known to have existed in Crescent Creek include bull trout, redband trout, mountain whitefish, and reticulate sculpin (*Cottus perplexus*) (Fies et al. 1996). A fish survey performed below Highway 58 by ODFW in 1992 found that although rainbow trout were the most abundant trout species in this section of Crescent Creek the density was lower than expected (Fies et al. 1996). Bull trout are assumed to have been extirpated from the Crescent Lake/ Creek system as a result of dam construction and the loss of passage.

Crescent Creek had been proposed as Core Area Habitat in the final draft Bull Trout Recovery Plan (USFWS 2002). Core Area Habitat was to extend from Whitefish Creek headwaters through Crescent Lake and Crescent Creek to the Confluence with the Little Deschutes River. The Little Deschutes River upstream to its headwaters has also been proposed. Tributaries to Crescent Creek, Cold Creek, Big Marsh Creek, and Refrigerator Creek had been proposed as Core Area bull trout habitat (USFWS 2002). However, the Final Critical Habitat Designation issued in the fall of 2004 excluded all Forest Service managed lands from Critical Habitat Designation.

**Bull Trout Status, Distribution, and Habitat**

The Columbia River populations of bull trout (*Salvelinus confluentus*) were listed as a threatened species by the USFWS under the Endangered Species Act on June 10, 1998 (63 FR 31647). The Odell Lake Recovery Unit encompasses an area of approximately 302 square kilometers. It is located within the Deschutes National Forest in Deschutes and Klamath Counties, Oregon. The Odell Lake Recovery Unit consists of Odell and Davis Lakes, Odell Creek, which flows from Odell Lake to Davis Lake, and all tributaries. The lakes were isolated from the Deschutes River by a lava flow about 5,500 years ago that impounded Odell Creek and formed Davis Lake. The lava flow isolated bull trout in Odell Lake from bull trout in the rest of the upper Deschutes Basin. Currently, bull trout are known to be spawning in only one tributary (Trapper Creek) to Odell Lake, indicating that there is one population of bull trout in the Recovery Unit. The estimated abundance of adult spawners is less than 100 (USFWS 2003).

The USFWS, ODFW, and Forest Service (USFS) have developed a recovery plan which addresses limiting factors for the Odell Lake Recovery Unit. Within the recovery unit, historical land use activities have impacted bull trout local populations. Limiting factors include competition with other fish species for resources, hybridization with brook trout, limited spawning and rearing habitat in the tributaries of Odell Lake, full or partial barriers created at railroad or road crossings, and habitat degradation due to large woody debris removal, intentional channelization of streams, and loss of riparian cover.

The goal for bull trout recovery is to ensure the long-term persistence of self-sustaining complex, interacting groups of bull trout distributed across the species' native range, so that the species can be de-listed. To accomplish this goal the following four objectives were identified for bull trout in the Odell Lake Recover Unit:

1. Maintain the current distribution of bull trout and restore distribution in previously occupied habitats within the Odell Lake Recovery Unit.
2. Establish an increasing trend in abundance of adult bull trout.
3. Restore and maintain suitable habitat conditions for all bull trout life history stages and forms.
4. Conserve genetic diversity and provide opportunity for genetic exchange (USFWS 2003).

The Odell Lake Bull Trout Working Group was established in the early 1990s for the purpose of determining the status of bull trout in Odell Lake. The formation of the working group originally consisted almost totally of area biologists from ODFW and the USFS. It was expanded to include other interests in 1996 and to develop a conservation strategy for Odell Lake bull trout. The Odell Lake Bull Trout Working Group became the Recovery Unit Team when bull trout were listed in 1998. The USFWS completed the Recovery Plan in 2003 (USFWS 2003).

Currently there are no Critical Habitat Units (CHUs) for bull trout on the Deschutes National Forest. The US Fish and Wildlife Service has proposed that Odell Lake, Trapper Creek, Crystal Creek (Odell Lake tributaries), Odell Creek, Maklaks Creek and an unnamed left bank tributary of Odell Creek be added as critical habit. Designation of these water bodies as CHUs is expected in October of 2010. None of the action alternatives would affect proposed critical habitat.

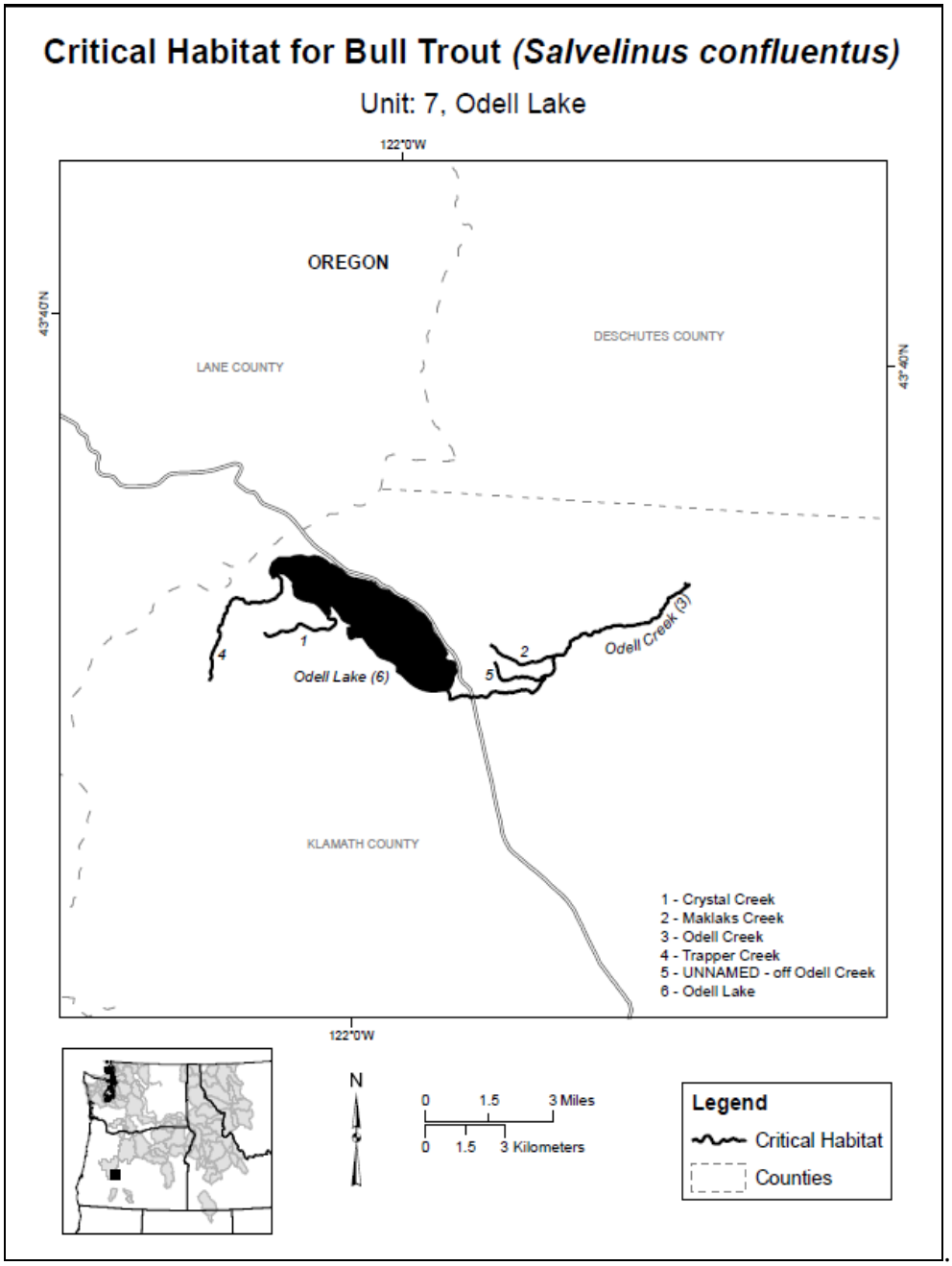


**Figure 27. Proposed Critical Habitat for Bull Trout in the Odell Lake Recovery Unit**

### Northwest Forest Plan

Part of the planning area lies within the range of the Northern Spotted Owl and the direction of the Northwest Forest Plan. The remaining planning area lies under the direction of PACFISH and East Side Screens.

### Stream Descriptions

The Little Deschutes River is a low gradient, cool water river meandering greatly for 95 miles through a forested, willow and grassland floodplain. The river begins in the Mt. Thielsen Wilderness with the upper 12 miles designated as a “Wild and Scenic” River. There is one impoundment on the River, at

approximately river mile 62, a mill pond at Gilchrist. The Little Deschutes River merges with the Deschutes River near the community of Sunriver, OR.

Hemlock Creek is a second order stream and the most significant tributary to the upper Little Deschutes River. The stream originates on the lower slopes of Burn Butte. Three tributaries feed into Hemlock Creek; these are Spruce Creek, Basin Creek, and Swamp Creek.

Spruce Creek is a low gradient stream with a sand and pumice substrate. Past grazing practices have altered the stream causing it to become downcut and entrenched in several areas. Spruce Creek is showing signs of recovery years after removal of grazing in the 1990s. Active beaver dams are no longer abundant, which has likely resulted in a lowered water table, reduced side channel area, and facilitated lodgepole encroachment into the meadows. There is an active restoration project underway to reverse this situation.

Rabbit Creek is a small, spring fed, first order stream which flows into Spruce Creek. As with the other streams in the area, past timber harvest projects have entered the riparian area and reduced future wood recruitment and shade. A reduction in large wood/shade may contribute to increased maximum water temperatures, and reduced aquatic habitat complexity.

Odell Creek flows out of a glacial moraine on the eastern border of Odell Lake. Approximately 52 cubic feet/second (cfs) in Odell Creek is contributed by spring fed tributaries (Odell Creek discharge data 1936-1976 and 1969 to 2003). Odell Creek flows approximately 7.5 miles from Odell Lake to Davis Lake. Maklaks Creek and two other spring-fed tributaries feed into Odell Creek and contribute approximately 50 percent of the flow during summer months (Dachtler 1998). Odell Creek is a low gradient stream, about 0.6 percent from the mouth to the confluence with Maklaks Creek and then increases to approximately 1.2 percent to the outlet at Odell Lake.

The Little Deschutes and Upper Deschutes 4$^{th}$ field hydrologic unit code (HUC) watersheds are part of the High Cascades Ecoregion and consist of basalt, andesite, and basaltic eruptive complexes that form large, overlapping shield volcanoes. The parent materials for the dominant soil types in this watershed are the air fall pumice and ash from the Mount Mazama eruption approximately 7,700 years ago. The glaciated portions of the watershed have fine sandy loam textured soils over compacted ground moraines. The subbasin is composed primarily of older glacial outwash that affects the character of water transport and plant growth in the area. Recreational activities tend to gravitate to water and riparian areas. Existing damage seen in Riparian areas include denuded/dead vegetation, compaction or removal[56] of soils, and streambank erosion which reduce potential revegetation or productivity of the soil to grow vegetation. This is limited to specific sites along the stream which comprise less than one percent of the total length.

Crescent Creek flows from Crescent Lake for approximately 26 miles before entering the Little Deschutes River near the town of Gilchrist, Oregon. Crescent Lake was a natural, glacially carved lake, which was modified with a dam structure in 1922 to increase the storage capacity for irrigation purposes. The dam was reconstructed in 1955-56 to restore the storage capacity of the project and replace the original timber-crib dam structure with concrete. The dam structure is 40 feet tall and does not allow for fish passage (Bureau of Reclamation 2004). Bull trout that once inhabited this lake are presumed to have since been extirpated. The two main tributaries to Crescent Creek (below the dam) are Big Marsh Creek and Cold Creek.

[56] Compaction is compressing the soils thus reducing hydrologic flow, while removal is scraping away the top layers from activity such as high speed turns etc.

Cold Creek is a spring fed tributary to Crescent Creek. Cold Creek is aptly named with very cold water temperatures maintained throughout the summer months. As a spring fed stream, flows remain fairly consistent throughout the year. Riparian vegetation and wet soils surround the stream are mostly intact, and the creek is properly functioning.

**Flow**

Crescent Creek discharge fluctuates greatly due to an irrigation dam at the outlet of Crescent Lake. Flow regulation at Crescent Lake Dam is probably the greatest limiting factor affecting fish habitat. Because of flow modifications, the natural hydrograph of Crescent Creek has changed to low flows prevalent between September and April during reservoir storage months and high flows during the rest of the year. The State of Oregon owns an instream water right to Crescent Creek from the confluence with the Little Deschutes River to the Crescent Lake Dam. This Water Right is dated 10-11-1990 and is junior to that of the irrigation district.

The State of Oregon owns an instream water right for Odell Creek dated September 24, 1990.

**Water Quality**

The Clean Water Act requires the State of Oregon to develop water quality standards that protect the beneficial uses of the water. The act also requires the state to establish a list of water bodies that do not meet such standards. Beneficial uses and the associated water quality standards are generally applicable drainage wide. At a minimum, uses are considered attainable wherever feasible or wherever attained historically.

The Little Deschutes River is listed on the Oregon Department of Environmental Quality's (DEQ) 2002 303(d) list as "Water Quality Limited" for elevated summer stream temperatures from river mile 54 to river mile 78 (http://www.deq.state.or.us/wq/WQLData/SubBasinList02.asp). Activities proposed must improve conditions in the stream, or at least ensure that the conditions are not further degraded.

Crescent Creek, throughout its length is listed on the 303(d) list as "Water Quality Limited" by the Oregon Department of Environmental Quality for temperatures exceeding State guidelines. This is mainly due to impoundment and flows released from the dam. Water quality standards cannot be met without restoring streamflows. Due to the remote nature of a considerable segment of Crescent Creek, there are very few user-created trails or dispersed camps that have potential to affect these parameters.

***Water Temperature***

Water temperature is the measured result of heat energy inputs and losses. The elements involved in determining net heat energy of a water body include solar energy, long wave radiation, evaporation, convection, conduction, and exchange (Boyd and Sturdevant 1997). Each element is influenced by climatological and geological factors. Mean pool depth, percentage of pools making up the channel, and riparian shade all affect substrate conduction, evaporation, and solar radiation, which are correlated with maximum daily water temperatures (Hawkins et al. 1997). Latitude, basin elevation, and slope of a stream effects long wave radiation, convection, and evaporation and have been correlated with minimum and mean daily water temperatures (Hawkins et al. 1997). Any increase in solar radiation during daytime conditions would directly increase stream temperature (Brown et al. 1972).

Water temperature is a fundamental parameter affecting a water body's ecology (Minshall 1978; Vannote et al. 1980). As a stream moves from headwaters to mouth, exposure to solar radiation increases and water warms to near the ambient air temperature (Bartholow 1989). Lakes at the headwaters of streams can have a dramatic effect on the physical, chemical, and biological composition of streams that form below them (Gore 1994). Lakes releasing warm surface water into streams can hasten a stream system's community ecology to resemble communities further down stream, as compared to other headwater

streams (Ward and Stanford 1983; Gore 1994). Impoundments such as Crane Prairie and Wickiup reservoirs also have an impact on water temperature depending upon the depth of withdrawal and size of impoundment. Water released from the hypolimnion would be much colder, potentially hypoxic, and nutrient rich compared to a surface release of a natural lake or stream prior to the impoundment (Gore 1994).

Land management activities can affect water temperature. Vegetation loss from recreation activities or altering the water table to allow encroachment of upland vegetation into the riparian zone can affect the shade, cover, and the amount of solar radiation input into the water surface. Flow modification is another land management activity that can significantly affect water temperature. Reducing water volume in a river channel normally developed to maintain a larger water volume would increase the normal width to depth ratios that creates a larger surface area to volume ratio. This condition increases the rate in which water temperatures increase.

In accordance with the United States Code (33 U.S.C. 1313(d) and 1319 (b)), the Oregon Department of Environmental Quality (ODEQ) has identified 16 stream segments in the Upper and Little Deschutes Subbasins as non-compliant, for water temperature under the 2002 water quality standards. Such water quality limited water bodies require the application of Total Maximum Daily Loads (TMDLs) or other pollution control requirements. The ODEQ provides requirements for different species and life stages for assessing water temperature exceedences for different streams. For the 2002 listing in the Upper and Little Deschutes Subbasins, streams were designated for bull trout use ($10^{o}$C), resident salmonid spawning ($12.8^{o}$C) or resident salmonid rearing ($17.8^{o}$C). Under the new 2004 ruling (ODEQ 2004) these numeric criteria have changed: Bull trout spawning and rearing habitat ($12^{o}$C) or salmonid rearing and migration ($18^{o}$C). In addition, there is a no longer numeric criterion for salmonid spawning temperatures. Where conditions warrant, 2004 standards would be referenced.

To assess the current stream temperature problems and the conditions contributing to these problems, channel form and evolution, riparian condition, stream flow, and source type were evaluated in the Upper and Little Deschutes Sub-basins. Regular monitoring of stream temperatures in the Upper and Little Deschutes Sub-basin during the past decade has identified 16 stream segments on 11 different streams that did not meet one of the three 2002 water temperature standards for bull trout or other freshwater salmonids criteria (Table 100). Two streams did not meet the $10^{o}$ C water temperature standard for supporting bull trout. Seven stream segments exceeded the summer maximum water temperatures statutory standard of the State of Oregon of $17.8^{o}$C. Six stream segments did not meet the standard of $12.8^{o}$ C during spawning period from September 1 to June 30. All water temperature limited streams within the Upper and Little Deschutes Subbasins are perennial, fish-bearing streams and provide habitat for bull trout, redband trout, brook trout, brown trout and other native and non-native game and forage fish (USFS 2004).

**Table 100. Water Bodies not Meeting the Water Temperature Standard Established by ODEQ (2002) in the Upper Deschutes and Little Deschutes Subbasins**[57]

| Waterbody | RM start | RM end | Numeric temperature Criteria ($^oC$) | Standard |
|---|---|---|---|---|
| Upper Deschutes Subbasin | | | | |
| Brush Creek* | 0.0 | 2.0 | 10 | Bull trout |
| Canyon Creek* | 0.0 | 11.4 | 10 | Bull trout |
| First Creek+ | 3.6 | 12.1 | 12.8 | Salmonid spawning |
| Lake Creek+ | 0.0 | 1.5 | 17.8 | Salmonid rearing |
| Deschutes River | 126.0 | 168.2 | 17.8 | Salmonid Rearing |
| Deschutes River | 126.0 | 189.4 | 12.8 | Salmonid spawning |
| Odell Creek+ | 0.0 | 11.0 | 17.8 | Salmonid rearing |
| Odell Creek+ | 0.0 | 11.0 | 12.8 | Salmonid rearing |
| Whychus Creek | 1.6 | 21.0 | 12.8 | Salmonid spawning |
| Whychus Creek | 1.6 | 21.0 | 17.8 | Salmonid rearing |
| Whychus Creek | 0.0 | 1.6 | 12.8 | Salmonid Spawning |
| Indian Ford | 0.0 | 11.2 | 17.8 | Salmonid rearing |
| Crescent Creek+ | 0.0 | 26.1 | 17.8 | Salmonid rearing |
| Little Deschutes Subbasin | | | | |
| Little Deschutes River | 54.1 | 78.0 | 17.8 | Salmonid Rearing |
| Little Deschutes River | 54.1 | 78.0 | 12.8 | Salmonid Spawning |
| Paulina Creek | 0.0 | 13.2 | 17.8 | Salmonid Rearing |

* Streams that would meet the 2004 water temperature standards.
+ Streams that would now include bull trout criteria.

The Little Deschutes River would continue to be listed for exceeding the 2004 standards.

The Little Deschutes River was listed on the Oregon DEQ's 2002 303(d) "Water Quality Limited Streams" list for exceeding standards for summer temperatures (river mile 54.1 to 78) and not meeting dissolved oxygen standards from river mile 0-54.1 (confluence with Crescent Creek). The Little Deschutes River originates in the Mt. Thielsen Wilderness and gradually warms as it moves north towards Crescent, OR. From Crescent to the confluence with the Deschutes River, the Little Deschutes River maintains a fairly consistent temperature. The following chart was generated with Flight Line Infrared (FLIR) analysis of surface water temperatures. Direction of flow is from right to left.

[57] Streams with superscripts may change with the newly adopted 2004 standards.

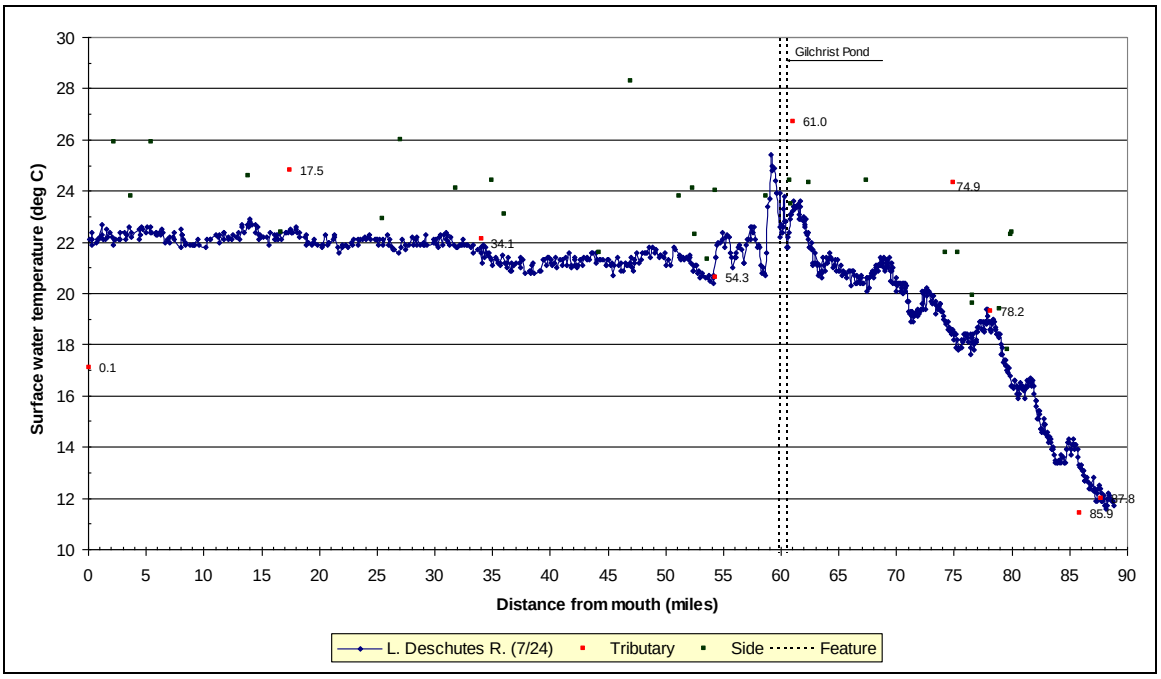


**Figure 28. Little Deschutes River Surface Temperature at the Thalwag (centerline) Derived from FLIR Imaging (July 2003)**

As shown in Figure 28, the Little Deschutes River warms considerably by the time it reaches the confluence with Hemlock Creek (RM 78.2). The wide and shallow stream channel along with a relatively open riparian condition allows solar radiation to increase stream temperatures during the daylight hours. Conversely, the wide open sky above the stream allows the water temperatures to quickly cool during the night. The FLIR data presented above also shows the temperatures of tributary streams (green dots) or side channels/oxbows (red dots), and the positive or negative effect the stream has on temperatures in the Little Deschutes River.

*Little Deschutes River (RM 54- 78):* The Little Deschutes River flows for nearly 100 miles from its headwaters in the Mount Thielsen Wilderness to its confluence with the Deschutes River near Sunriver, Oregon. The terrain is mixed with a dendritic drainage pattern from its headwaters to about the crossing of Highway 58. The Little Deschutes River then flows through a long, flat, low gradient plain with two tributaries along the remaining 82 miles of stream before entering the Deschutes River. Walker Irrigation District has one permitted canal withdrawing 17 percent of the monthly summer discharge from the Little Deschutes River at RM 26 (Breuner 2003). Tumalo Irrigation District also has water rights and stores 86,050 acre-feet of water in Crescent Lake. A release rate of 180 cfs is routed through Crescent Creek and the Little Deschutes River (USFS 2001b). The Little Deschutes River flows through Deschutes National Forest, Prineville District Bureau of Land Management, and private lands on its way to the Deschutes River. On private land near Gilchrist, Oregon, Interfor Pacific operates a dam and millpond (Gilchrist millpond) on the Little Deschutes River.

The Upper Deschutes Watershed Council provides a temperature characterization for the Little Deschutes River (Breuner 2003). Their analysis shows relatively consistent water temperatures of about 22$^{o}$ to 24$^{o}$C for over 55 miles before entering the Deschutes River. Hemlock Creek, a headwater tributary, was found to discharge slightly warmer water than the Little Deschutes. Water discharged from the millpond is also warmer water than the river (Watershed Sciences 2001). These two inflows seem to have little influence on the overall water temperature of the Little Deschutes River. There is a very steep increase in water

temperatures located between river mile 82 (Hwy 58) and 62.4 (Gilchrist millpond). At this stage the river transitions from higher gradient mixed conifer forest environment to a low gradient willow and alder dominated riparian ecosystem with lodgepole forest uplands.

Water temperatures from the Gilchrist millpond come in almost 3.5$^{o}$C warmer than the Little Deschutes River at that river mile (Watershed Sciences 2001). Within two miles downstream of the millpond water temperatures reduce to the ambient temperature.

Consistent water temperatures are maintained from the confluence of Crescent Creek to the Little Deschutes River. The water volume removed from the Little Deschutes River by the Walker Irrigation District Canal at RM 26 seems to have somewhat of an impact on water temperatures.

The amount of oxbows on the Little Deschutes River may have an influence on the ambient water temperature of the Little Deschutes River. Riparian vegetation can also influence the Little Deschutes River. The river flows through mostly willow and alder riparian. Occasional lodgepole pine trees (*Pinus contorta*) are identified along the river showing shade cast along the river. However the greatest warming occurs through the private land pasture near Crescent to the Gilchrist Millpond.

Spruce Creek is a tributary to Hemlock Creek. Only one year (2005) of thermograph (temperature data recorded hourly) data is available for this tributary. This data was recorded at the Forest Service 5830 road crossing, which is approximately a mile and a half upstream of the confluence with Hemlock Creek. Spruce Creek appears to maintain cool temperatures throughout the summer months.

Hemlock Creek is a tributary to the Little Deschutes River at RM 78. The Little Deschutes River is listed on the 303(d) list for temperature from this confluence downstream to river mile 54. Hemlock Creek is generally warm during the summer months.

Thermograph data is unavailable for Basin or Rabbit Creeks. Stream temperatures were recorded during USFS level II stream surveys. Water temperatures were cool in Rabbit Creek, with a maximum temperature of 10°C being recorded (Meyer 1991). Stream temperatures recorded in Basin Creek ranged from 11.5°C to 14°C (Platz 1989). Temperature data is unavailable for Swamp Creek.

**Geology**

The basin has three major soil types. The soil in the lower reach is pumice lapilli and volcanic ash over a glacial outwash. The middle reach has a pumice gravel and volcanic ash type soil. The upper reach has pumice lapilli and volcanic ash over buried soils and glacial till. All of the soil types are highly porous (USFS 1991).

Most of the surface landforms and topography as well as the subsurface geology of the Upper Deschutes Subbasin are a diverse mix resulting from 35 million years of glacial and volcanic activity combined with structural faulting and erosion. In general, the geologic units found in the subbasin include a majority of quaternary to late tertiary basaltic to andesitic lava (USGS 2001). Pleistocene volcanic rocks traverse the crest of the Cascades and the High Cascade peaks are primarily composed of andesite on top of a foundation of basalt (Loy 2001). In the Bend area, a series of Quaternary ash flow tuff units believed to have originated from the Broken Top area are combined with basalt flows originating in the Cascades. These features cover most of the area west of the Deschutes River. East of the Deschutes River, basalt from Newberry Caldera is the predominant rock type (McNamara 1999).

A large portion of the subbasin had been glaciated in the past. Approximately 14,000 years ago, the Bridge Creek and Tumalo Creek drainage areas were overlain with almost 1,000 feet of ice.

Consequently, all pre-glacial soils in these areas were first covered by glacial till and then later layered with coarse pumice and ash from the eruption of Mt Mazama. Mt. Mazama, located south of the subbasin, erupted 6,850 years ago and buried much of the area beneath one to ten feet of volcanic tephra, thus contributing to the predominant soil composition throughout the subbasin (Chitwood 2000). The Mazama tephra is composed of rhyolitic ash and fine light-colored pumice fragments (USGS 1986).

**Climate**

The climate in the subbasin is continental. The Upper Deschutes Subbasin sits on the eastern side of the Oregon Cascade Mountains. The rain shadow effect plays a substantial role in defining the climate of both sides of the Cascade Range. Storm clouds approaching from the Pacific Ocean rise as they reach the mountains and release a majority of their precipitation on the westward slopes of the Cascades, thereby creating a much drier climate on the eastern slopes. The majority (55-65 percent) of the precipitation that reaches the area falls as snow between November and March (USFS 1990). The mean annual precipitation varies widely in the subbasin; ranging from 140 inches in higher elevations down to 10 inches in the Deschutes River Valley and the eastern parts of the subbasin (ODFW 1996).
Air temperatures in the subbasins are generally moderate with warm days and cool nights. Bend averages about 10 days per year with temperatures over 90 $^{o}$ F. Winter lows average between 20$^{o}$ and 30$^{o}$ F (USFS 1990; Chitwood et al. 2004).

**Existing User-created Trails**

The density and, more importantly, the location of forest roads and user-created trails would be the factors most influencing water quality and fish habitat as it pertains to this project. The following table (Table 101) displays the density of all Forest Service (FS) roads combined with user-created trails and use of Forest Service closed roads within riparian reserves/riparian habitat conservation areas (RHCAs) by subwatershed. The column labeled "Density FS Open Roads" displays all Forest Service roads Maintenance Level 2[58] and greater within the Riparian Reserve/RHCA buffer. Additional Maintenance Level 1 roads, which are intended to be closed and in storage for administrative use are frequently used as travel routes for OHVs. When they are being used by the Forest Service for a particular activity, they are maintained until they are no longer needed. Maintenance Level 1 roads are displayed in the column titled "Density of User-Defined Routes" in Table 101. This column shows the density of known Maintenance Level 1 roads within the riparian reserves buffer being used as OHV travel routes. The "User-Created Trails" column is a summary of all identified routes created by forest users in addition to the existing forest service roads network. Therefore, with the known use there is a minimum of 13.3 miles of user-created trails and a minimum of 102 miles of Maintenance Level 1 roads being used as travel routes within the riparian reserves buffer in the planning area.

The highest density of user-defined routes adjacent to a perennial water body is in the Gilchrist Junction subwatershed where there is a minimum of 5.15 miles per square mile of user defined routes along the Little Deschutes River and tributaries. Many of these routes provide access to dispersed camping sites. The Forest Service has made a good faith effort to map these routes.

Existing user-created trails may cross streams or wetlands, directly reducing water quality by increasing fine sediment inputs. Motorized trails within close proximity of water bodies also increase the probability of introducing chemical contaminants such as petroleum products.

One known user-created stream crossing exists upstream of the community of Two Rivers North on the Little Deschutes River. This crossing is made of a few stringer logs. This crossing would be removed under action Alternatives B, D, and E, and the riparian reserve rehabilitated (using native seeds or plants).

[58] Maintenance Level 2 roads are maintained for high clearance vehicles, while Maintenance Level 3 and higher are maintained for passenger cars.

Under Alternative C, this crossing would be developed to Forest Service standards, which would include a full spanning bridge. Several other OHV trails cross mapped riparian areas that do not hold perennial water at the surface.

**Table 101. Riparian Reserves and Riparian Habitat Conservation Areas Managed by the Deschutes National Forest with Road and Trail Densities by Subwatershed[59]**

| 5th Field WA | 6th Field WA | Total FS Road (Miles) | FS Open Road (Miles) | Miles$^2$ (640 acres =1mi$^2$) | Density FS Open Roads (mi/mi$^2$) | User Defined Routes (rds+trails) Miles | Density of User Defined Routes (rds+trails) mi/mi$^2$ | Density Total FS "Open" Motorized Maint. Level 2 and above + user-defined routes mi/mi$^2$ |
|---|---|---|---|---|---|---|---|---|
| Crescent Creek | Cold | 7.88 | 5.71 | 6.04 | 0.95 | 14.35 | 2.38 | 0.95 |
| | Lower Big Marsh Ck | 11.23 | 6.64 | 9.85 | 0.67 | 10.72 | 1.09 | 0.67 |
| | Middle Crescent Ck | 1.76 | 1.57 | 1.81 | 0.87 | 4.55 | 2.51 | 0.87 |
| | Lower Crescent Ck | 0.25 | 0.25 | 2.22 | 0.11 | 6.48 | 2.92 | 0.11 |
| | | | | | | | | |
| Little Walker Mtn. | Corral Springs | 0.00 | 0.00 | 0.10 | 0.00 | 0.21 | 2.02 | 0.00 |
| | Crescent Butte | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Little Walker Mtn. | 0.03 | 0.03 | 0.01 | 3.70 | 0.03 | 3.70 | 3.70 |
| | North Paunina | 5.06 | 4.25 | 1.91 | 2.23 | 10.00 | 5.24 | 3.74 |
| | North Walker | 2.22 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 |
| | South Paunina | 4.05 | 2.56 | 1.06 | 2.43 | 6.94 | 6.57 | 3.59 |
| | | | | | | | | |
| Upper Little Deschutes River | Bunny Butte | 1.78 | 1.53 | 1.43 | 1.07 | 6.61 | 4.63 | 1.32 |
| | Clover Bu. | 4.04 | 3.67 | 3.98 | 0.92 | 8.14 | 2.04 | 1.60 |
| | Gilchrist Jct. | 6.69 | 4.81 | 2.21 | 2.18 | 11.37 | 5.15 | 4.20 |
| | Hemlock Ck | 15.57 | 10.99 | 6.97 | 1.58 | 13.16 | 1.89 | 1.71 |
| | Little Odell Creek | 2.36 | 2.02 | 1.45 | 1.39 | 2.97 | 2.05 | 1.39 |
| | | | | | | | | |
| Wickiup | Odell Creek | 8.53 | 5.26 | 3.95 | 1.33 | 6.69 | 4.69 | 4.52 |
| | | | | | | | | |
| Total | | 71.45 | 49.29 | 43.03 | N/A | 102.252 | N/A | 1.45 |

Roads and trails within the riparian reserves have the potential to negatively affect water quality by directly or indirectly increasing sedimentation delivery and/or erosion, by compacting soils and increasing the drainage network, or by reducing riparian vegetation and cover/shade. Foltz (2006) has shown that the presence of OHV trails, regardless of disturbance level can increase surface erosion. Currently, there

[59]Subwatersheds within the planning area and not displayed above do not have surface water or riparian areas within Forest Service managed lands.

are several user-created trails that access water bodies within the planning area and therefore miles/mile$^2$ densities are high.

In forested lands of the central Cascades, modification of surface flow results from roadbeds being constructed perpendicular to natural water flow patterns. This occurs on hillslopes or in valley bottoms when soils are saturated with water, frozen, or when soil structure inhibits water absorption. Road interception of subsurface flow occurs mainly on steep hillsides where the roadbed is cut deep enough into the hillside to intercept some or all of the subsurface flow. Ditches associated with these roads are an extension of the channel system and transport the water more efficiently, increasing the potential of storm runoff, magnitude of peak flows, and sediment delivery to larger stream channels (Wemple et al. 1990 in Upper Little Deschutes Roads Analysis 2002).

The road systems are an extension of the channel network (Wemple et al. 1996). Channels are formed from routing the concentration of water along road ditches to established stream channels. Jones and Grant (1996) found roads alone advanced the timing of peak discharge and slightly increased discharge. These functions of the road network ultimately affect the hydrograph of a stream increasing bankfull discharges and larger events. Due to the high infiltration rates of the volcanic soils in the watershed, these increases in discharges would be slight (Upper Deschutes Watershed Analysis 2002).

High flow events at stream crossings pose a high risk of large sediment inputs if: the culverts become plugged, flows exceed the culvert capacity, or the stream overtops the road causing the road fill to erode and causing it to fail (Upper Deschutes Watershed Analysis 2002). Although this is uncommon within the Three Trails OHV Project area there is one existing culvert that is failing on the 5800620 road adjacent to the railroad near Cold Creek and is scheduled to be replaced in summer 2010 (K. Kittrell pers. comm. 2010).

### Sediment/Turbidity

The sediment in Hemlock Creek is composed mostly of pumice sands with gravel being sub-dominant. The upper Little Deschutes River substrate is comprised of sands 35-60 percent and gravels depending on reach. Sand dominates Spruce Creek averaging over 60 percent of the substrate (USFS 1991).

Within the wilderness boundary, there is a raw slope along the Little Deschutes River. This site contributes significant amounts of fine sediment during peak discharge events. During a recent rain on snow event (December 2004), the Little Deschutes River was carrying a high amount of fine sediment. Silt sized material was deposited along the banks throughout the project area.

Commercial timber harvest and roads construction in particular (Rice et al. 1972; Beschta 1978) have great potential to lead to additional sediment delivery to area streams. Reid and Dunne (1984) suggest that unpaved roads in particular can yield high volumes of sediment input for streams. Reid and Dunne found (western Washington) that a heavily used road segment contributes 130 times more sediment than an abandoned road and a paved road segment produces less than one percent as much sediment as a heavily used gravel road. They showed that the rate of erosion of gravel roads is extremely sensitive to the rate of use. In their study they found heavily used (four or more loaded trucks per day) gravel roads contribute 7.5 times as much sediment as the same road when not in use (it should be noted that erosion in their study was associated with rain events). Erosion of gravel road surfaces is of concern because most sediment from this source is finer than 2mm; this fine-grained material is the size most harmful to fish and water quality (Reid and Dunne 1984). Eaglin and Hubert (1993) showed a positive correlation between the density of stream crossings and the proportion of a drainage that was logged to the amount of fine sediments found in streams and the level of embeddedness of the substrate.

Fine sediment contributions degrade fish habitat by increasing embeddedness, which reduces the interstitial spaces between gravels and cobble that make up the stream bed. Embedded streams provide poor spawning habitat as the bed is difficult to spawn in and eggs have a tendency to get buried beneath fine sediment, suffocating them. In addition to the negative impacts fine sediments have on spawning, they also inhibit a fish's ability to breath, and see (find food and avoid predation).

Studies indicate that the ability of salmonids to capture food may be impaired at turbidity values in the range of 25 to 70 Nephelometric Turbidity Units (NTU). Growth may be reduced and gill tissues damaged after 5 to 10 days exposure to turbidity of 25 NTU, and some species may be displaced at 50 NTU (MacDonald 1991). Turbidity is a result of suspended clay or silt particles in the water column and typically occurs during storm runoff events. Oregon administration rules state, "No more than 10 percent cumulative increases in natural streams turbidities shall be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity" (OAR Chapter 340, Division 41-DEQ).

## Direct and Indirect Effects

### Alternative A - No Action

The No Action Alternative currently has few restrictions for motorized travel, except in a few key management areas or unless the line officer determines it threatens other resource values. When the Forest-wide Travel Management project is implemented, motorized travel would be subject to designated routes only.

The continued unrestricted use of OHVs has the highest potential to lead to the degradation of water quality through fine sediment inputs, and the degradation of riparian vegetation, pollution, and rutting of fragile soils. Unregulated OHV trails are abundant within the riparian reserve of several stream segments within the planning area. Some of these trails systems cross streams via fords and man-made structures (log bridges) that likely affect water quality through fine sediment inputs and reduced vegetation cover. The development of these user-created trails and crossings is an ongoing process. Two known user-defined trails cross the Little Deschutes River, one upstream and one downstream of the community of Two Rivers North. In addition to user-created trails, Maintenance Level 1 roads are currently being used by OHVs. These closed roads are not being maintained and are potential sources of sediment when adjacent to a stream or wetland feature. The following Figure 29 depicts an example along the Little Deschutes River where a user-created road crosses an eroding bank of the river. This type of unregulated use directly degrades water quality and prevents attainment of desired future conditions by promoting lateral erosion of the stream bank (widening the stream channel), increasing fine sediment delivery, and decreasing riparian vegetation (loss of shade and filtering of mobilized fine sediments). Other hill climb areas were observed where runoff and sediment were being delivered directly into the riparian area. These types of unmanaged roads/trails negatively affect water quality through erosion, fine sediment input, and denuding riparian vegetation.

**Figure 29. User-created Road along the Little Deschutes River Providing Access to Dispersed Campsites**

### Common to all Action Alternatives

***303(d)***

None of the action alternatives would considerably affect the water quality parameters for which the Little Deschutes River is listed as impaired. While a reduction of OHV use from within the riparian area would likely improve riparian vegetation cover, the percent change (less than one percent) would not likely be enough to affect shading of the Little Deschutes River which is linked to temperature and dissolved oxygen content.

For Crescent Creek, due to the remote terrain associated with a considerable portion of the corridor and the lack of motorized access, plus the very limited designation of road and trail within the Crescent Creek corridor, none of the action alternatives would affect 303(d) parameters. The 303(d) listing is mainly due to impoundment and flows released from the dam. Water quality standards cannot be met without restoring streamflows. Due to the remote nature of a considerable segment of Crescent Creek, there are very few user-created trails or dispersed camps that have potential to affect these parameters.

***Metolius-Windigo Horse Trail***

In all action alternatives, the Metolius-Windigo horse trail which utilizes Forest Service Road 5800620 has and would continue to provide shared use among motorized and non-motorized users. This road has been engineered with Best Management Practices for water quality (culverts and drainage systems appropriate for the location). Alternatives C through E would share common tread in or near wet areas and riparian-associated vegetation. Outside those areas and during every opportunity available, users

would be on a parallel trail up to 400 feet separation where possible. Approximately one-half mile of trail would potentially be within the Riparian Habitat Conservation Area buffer of 100 feet outside of Cold Creek and 300 feet of the creek itself.

Fugitive dust associated with motorized travel would be less than other segments because of composition of the native trail surface. The pumice is less prone to becoming airborne. Therefore, the potential for fugitive dust affecting water quality is extremely low because of limited connectivity to standing water except along moister sections associated with Cold Creek drainage and the localized and limited nature of becoming airborne. There is more discussion regarding fugitive dust in this section.

Because use is confined to an existing road prism through wet areas, would not have new crossings of any areas associated with wet conditions or riparian-associated vegetation, flat topography, well drained soils, and no connectivity to standing water, activities associated with the Metolius-Windigo trail would have no measureable effect on water quality in the Cold Creek drainage. Also, there would be no short or long-term effect to resident fish.

***Water Crossings***

Alternative C includes the development of an OHV bridge crossing over the Little Deschutes River upstream of the community of Two Rivers North. This is the only new stream crossing of perennial flow under any of the action alternatives. The Little Deschutes River is a recreation Wild and Scenic River. Construction of this bridge crossing would require that the structure be entirely outside of the high water mark. The bridge and abutments would not interfere with the free flowing nature of the river. Potential effects to water quality in association with a bridge crossing include the construction and use of the structure. Construction of the bridge would require excavation for abutments and likely the removal of some streamside trees. Excavation for concrete abutments and footings poses a potential to increase fine sediment delivery to the stream. This potential is considered very small because activities would occur outside the riparian associated vegetation and silt fencing would further reduce potential for sediment associated with the bridge construction from entering the stream.

Also associated with the bridge construction would be the removal of less than 10 trees for a 50 inch trail with potential to provide shading. They also would provide a diminutive amount of future recruitment of woody material to the stream channel. Construction of the bridge would be performed with Best Management Engineering Practices[60], which includes the following:

**Road System Best Management Practices:**

- **R-1 Title:** Guidelines for the Location and Design of Roads.
  *Objective*: To located and design roads with minimal resource damage.
- **R-2 Title:** Erosion Control Plan
  *Objective*: To limit and mitigate erosion and sedimentation through effective planning prior to initiation of road constructions activities and through effective contract administration during construction.
- **R-3 Title:** Timing of Construction Activities.
  *Objection*: To minimize erosion by conducting road construction operation during minimal runoff periods.
- **R-6 Title:** Dispersion of Subsurface Drainage Associated with Roads.

[60] Best Management Practices (BMPs) (USDA 1988) apply. Specific BMPs are for Road Systems (pp. 22-42) and Watershed Management (pp. 48-55). These practices maintain the physical integrity of the aquatic system and in cooperation with the State of Oregon, are required to be followed in accordance with the Clean Water Act.

*Objective*: To minimize the possibilities of roadbed and cut or fill slope failure and subsequent production of sediment.

- **R-9 Title:** Timely Erosion Control Measures on Incompleted Roads and Stream Crossing.
  *Objective*: To minimize erosion of and sedimentation from disturbed ground on incomplete projects.
- **R-13 Title:** Diversion of Flow Around Construction Sites
  *Objective*: (1) To ensure all stream diversion are carefully planned, (2) to minimize downstream sedimentation, (3) to restore stream channels to their natural grade, condition, and alignment as soon as possible.
- **R-18 Title:** Maintenance of Roads.
  *Objective*: To maintain roads in a manner which provides for water quality protection by controlling the placement of waste material, keeping drainage facilities open, and by repairing ruts and failures to reduce sedimentation and erosion.

Solar radiation associated with the scope of tree removal for bridge construction would have an insignificant and immeasurable effect to water temperature. Also, the amount of water flow and the very short time it is exposed to sunlight created by the opening would be more than offset by restoration activities to restore shading in the reach.

In addition, development and use of an OHV trail crossing the Little Deschutes would likely increase the potential for fugitive dust entering the wetted channel. Therefore, a Project Design Feature was included that would harden surfaces on the approaches to the bridge. Using Best Management Practices and hardened approaches to minimize potential for foreign substances entering the Little Deschutes, the amount of fugitive dust in addition to any other foreign material entering the stream would be so small it would not be quantifiable.

In addition to the proposed OHV bridge crossing of the Little Deschutes River under Alternative C, there are four other proposed riparian crossings in the action alternatives that would be changes to shared use associated with route designation. They would utilize existing Forest Service road crossings built to Best Management Practices standards for water quality. These crossings have proven to be effective and there is no evidence of sedimentation occurring. In addition to well drained soils and lack of hydrologic connectivity associated with the roads and trails to water, Best Management Practices, and Project Design Features there would be no effect to water quality associated with the crossings, or effect to resident fish.

***10-mile Trail***

The 10-mile trail in the Rivers segment is another segment of trail construction that would be within the RHCA. All of the action alternatives include an alignment that follows an existing user-created trail (10 Mile) which crosses four ephemeral draws that are truncated at a railroad grade (Figure 30) downstream. There is no surface connection to perennial streams or fish bearing water.

If avoidance of these four riparian segments is not possible, an elevated tread would be constructed to reduce the impacts on the riparian feature and the underlying tread in the swale would be decompacted to facilitate water percolation and reduce puddling. They also would be designed as to not interfere with surface or subsurface flow of water. In addition, the following Project Design Features would be utilized:

- Wherever possible, all trails would be located to overlay existing snowmobile trails, existing user-created trails, and/or areas where vegetation and soil may be previously disturbed.
- In order to maintain soil quality and to ensure maintenance of a quality trail riding experience for the users, season of use would generally be from May 1 through October 31.
- All routes and staging area would be designed and located to minimize erosion by maintaining proper drainage systems.

- Tread hardening systems (e.g. angular three inch diameter quarry rock), or materials and treatments that would achieve the same goal of protecting the tread would be installed wherever tread grade is less than two percent and water tends to pool.
- New trail segments would not be constructed directly up steep slopes. Sustained grades would not exceed 12 percent, and the maximum trail grade of any trail segment would not exceed 30 percent. This would reduce the capacity of the trail to capture and channel runoff.
- All trail construction in or near wet areas would be avoided, wherever possible. When unavoidable, install wooden puncheons (an artificial tread elevated above the ground) across wet or swampy areas.
- Downed wood cleared to create the trail tread would remain onsite and positioned to discourage OHV users from straying off the designated trail tread.
- All existing large woody debris would be retained within riparian reserves to provide nutrients and food to aquatic plants and insects, and provide terrestrial buffering to retard sediment-rich runoff from entering the stream network.
- All rehabilitation work areas would be revegetated with native species following disturbance. Erosion filtering fencing would be placed to control offsite movement of soils in rehabilitation areas adjacent to perennial streams.
- All routes and staging area would be designed and located to minimize erosion and potential sedimentation with drainage systems designed for the appropriate location and maintained over time. They also would be well away from surface water to prevent potential contamination from hazardous materials.

These features are in common use around the region and have been most recently successfully used on the Santiam Pass Summer Motorized Recreation Project OHV trail system.

It has been determined that construction of these crossings would have no quantifiable effect to water quality or resident fish or their habitat because these draws are ephemeral and terminate within 1,000 feet at a railroad prism, the drainages do not have surface connection to any body of water, and the Project Design Features are proven to be effective.

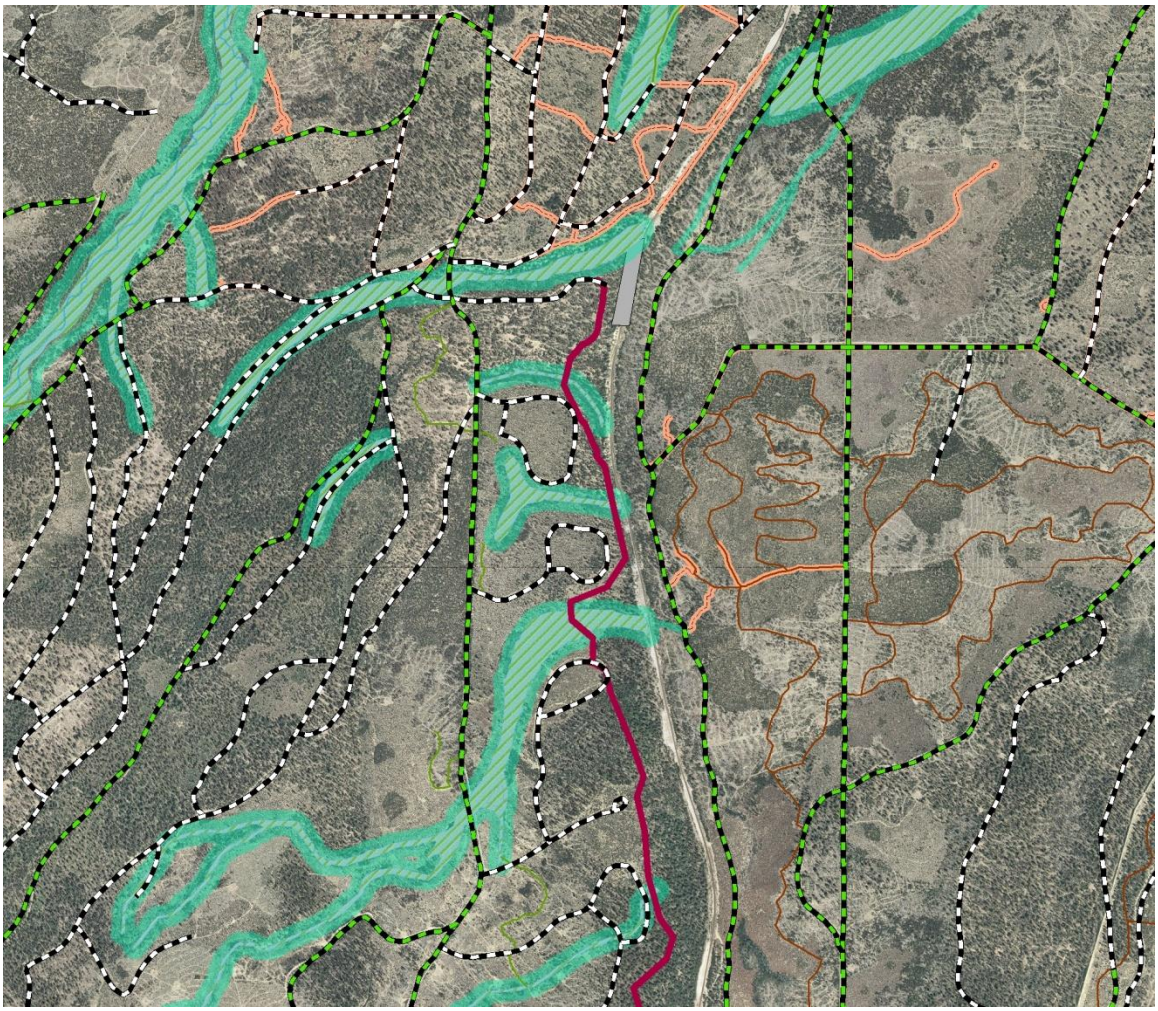

**Figure 30. Proposed Trail Alignment (purple) which Crosses Mapped Riparian Stringers**

**Figure 31. OHV Use Adjacent to the Little Deschutes River**

***Restoration Activities and Staging Areas***

Figure 31 displays existing conditions near a dispersed camp site and user-created OHV play area. It is an example of the type of the restoration activities proposed in the action alternatives, including obliteration and decompaction of soil to set up recovery processes and discourage further use, definition of where use is appropriate using structures and signing, and finally planting of native vegetation.

The greatest amount of riparian restoration activities would occur at the Rivers Midway staging area adjacent to the Little Deschutes River (Figure 13). In addition to closure of motor vehicle access and conversion to a foot trail, the following is a listing of activities that would occur at the staging area and where user-created motorized access occurs along the river.

- Decompaction/subsoiling of trails;
- Monitoring and hand pulling of invasive plant species;
- Planting of native plant material (seeds, live plants);
- Installation of bollards and other structures to block motor vehicle access; and
- Interpretative signs informing users of restoration activities.

Effects associated with these rehabilitation efforts include the potential for short term (less than three months) increases in fine sediment delivery associated with decompaction/subsoiling, digging holes for sign posts and plants, and placing barriers. Sediment delivery would be mitigated with the use of silt fences or equivalent to prevent loose soil from being delivered to the wetted channel. In the longer term (greater than six months), there would be a decrease in potential for fine sediment delivery and an increase in riparian vegetation cover. This would provide further buffer and opportunity to trap potential

sediment before it reaches the wetted channel from upslope disturbances. It also would slightly increase shade to the Little Deschutes River. There would be no short or long-term adverse effect to resident fish because the potential for sediment delivery is almost non-existent due to well-drained soils, flat terrain, and the activities associated with restoration provide very little connectivity to water bodies through overland flow.

In addition, all action alternatives include the development of a staging area and foot trail accessing the Little Deschutes River upstream of the Highway 58 crossing, off the 090 road. The activities would include moving a popular dispersed campsite and OHV play area in direct proximity to water further away and restoration of the site. It also would rehabilitate all redundant and unnecessary user-created foot trails. The new parking area would be approximately three acres and situated on the side of the road opposite the river channel. It is designed to allow public access to the Little Deschutes River via a foot trail converted from a user-created motorized trail. The parking area would be designed to focus snowmelt or runoff away from the stream. By implementing these activities, it would remedy one of the sites with the greatest potential for sediment delivery and restore native riparian vegetation.

Figure 32 displays a riparian crossing (orange) and also an example of a trail alignment (in red) that as mapped has a segment that enters into a Riparian Reserve/Riparian Habitat Conservation Area buffer (highlighted in yellow). The proposed trail (yellow segment) would be realigned further to the east to avoid the riparian buffer of this ephemeral draw.

The trail segment in orange is an existing user-created trail that crosses two mapped ephemeral riparian areas immediately adjacent to the railroad line. The continued use of this alignment is proposed under all alternatives. If avoidance of these two crossings is not feasible an elevated tread would be constructed to span the riparian features. Because the crossing is over two ephemeral draws at an already disturbed site, (user-created trail and railroad crossing), and there is not a defined stream channel, this crossing would have no effect on fish or aquatic habitat.

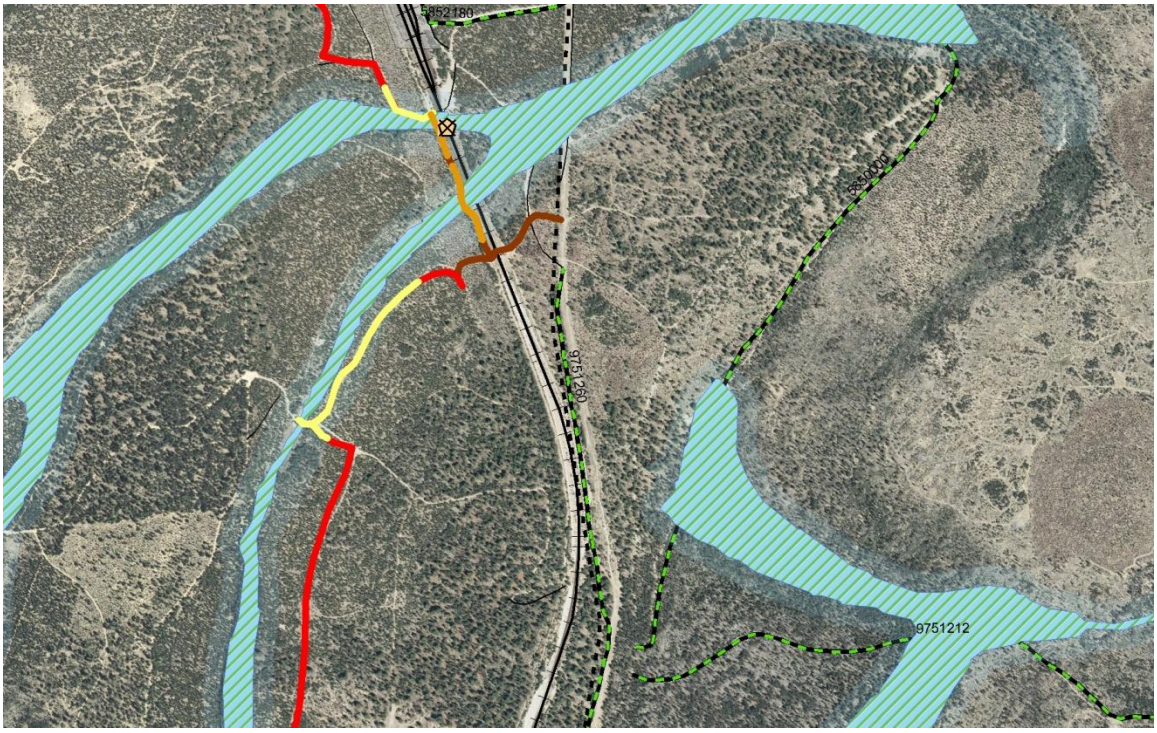


**Figure 32. An Example of a Proposed Trail Alignment and a Riparian Habitat Conservation Area Crossing**

***Fugitive Dust***

In general, the effects of fugitive dust are localized and confined largely to the immediate vicinity of the motorized route. The extent to which fugitive dust occurs is variably documented in literature, and in the case of dust generation, varies by vehicle class, speed, and soil type (Goossens 2009). None of the alternatives would reduce the potential for fugitive dust in a measurable quantity over the entire project area; however its proximity to water has the greatest potential effect to water quality. Riders tend to utilize the trail systems during the seasons when dusty conditions can be avoided[61].

Dust particles settling on vegetative matter along the trails may impact plant growth. Dust on the surface of leaves/needles may reduce the plants photosynthetic ability, whereas dust gathering on the undersides may block stomata openings and affect respiration. Visual observation by Meadows et al. (2008) and Padgett (2006) concluded that dust particles did not appear to heavily impact or create long lasting effects to the vegetation if a period of heavy usage was followed by rain. Meadows et al. (2008) noted that edge effect creates more dense vegetation along the trail, due to less competition for food and water. This dense vegetation would act as a filter, limiting the potential dust effects to adjacent understory vegetation.

Alternatives D and E provide for the greatest amount of riparian and water quality protection by providing the least amount of designated trail within the riparian reserve.

Since fugitive dust in Alternative A remains as the status quo until the Travel Management project is implemented, dust generation is more likely to occur in close proximity to a stream channel. In all action alternatives, the potential for dust entering a water body is greatly reduced as designated motorized routes are generally located away from water (Table 102). All action alternatives generally exclude motorized travel in Riparian Reserves and Riparian Habitat Conservation areas, which increases the probability of interception and retards potential delivery to the water body. Table 102 displays the miles of road and trail within the RR/RHCA by alternative. With the exception of a new bridge crossing in Alternative C, perennial water crossings are limited to existing Forest Service roads. These crossings have been designed to limit potential sedimentation and introduction of foreign contaminants. The greatest potential for dust affecting water quality is within Rivers Midway staging area in the Rivers segment adjacent to the Little Deschutes River. This site is currently being used as an approximate 3-acre dispersed site and portal/play area for the user-created trail system immediately adjacent to the Little Deschutes River around Two Rivers North subdivision. In all alternatives, staging area parking and camping would be defined and use directed farther away from the river (Figure 13), outside of the riparian reserve using mostly an existing clearing. The staging area improvements for this site would include a learner loop which would be located outside the Riparian Habitat Conservation Area, picnic tables, and a vault style self-contained bathroom. By moving this staging area/dispersed camp further from the stream corridor, potential risk from sedimentation and fugitive dust would be lessened, in addition to an increase in buffer as a result of restoration and revegetation activities. Also, there is a slight potential to intercept additional solar radiation. With the installation of a vault toilet there would be a potential elimination of nutrients from human waste entering the water way over the existing condition.

***Expected Increase in Visitation to the Trail System***

An expected 2.5-5.6 yearly increase (up to 11 riders) would occur over the next decade. The effects are largely confined to the tread of the trail and road prism of the routes. Coupled with the highly porous soils in the area and relatively low precipitation levels, the increase in trails and trail use would not change the effects already disclosed. Because designated routes would not be hydrologically connected to the stream channel network, changes in flow and/or potential sediment delivery are not likely to increase. Overall, use would be reduced by more than 15 miles within the riparian corridor and directed to the uplands where it can be disconnected from the stream channel network. Therefore, the slight

[61] 2009, communication with Vicki Ramming, COHVOPS Program Director

improvement of water quality and watershed conditions would more than offset any small increase in riders and the associated effects.

***Summary***

In summary, Alternatives B-E results in an overall reduction in road and trail densities averaged across 16 subwatersheds in the uplands and a reduction in road and trail densities within the Riparian Reserves and Riparian Habitat Conservation Areas. All four result in improved riparian conditions in varying degrees based on the number of miles of trail/road closed and their proximity to a stream/riparian feature. Alternative C would result in the addition of a water crossing over the Little Deschutes River. The development of a crossing over the river would likely result in potential for sediment delivery to the river through dust and fine sediment and a very small reduction in shade associated with bridge construction that is more than offset by other restoration and revegetation activities. All action alternatives maintain a designated trail that crosses six mapped ephemeral riparian areas in the Little Deschutes River drainage. Four of these mapped riparian areas become subterranean features (there is no surface water) in the vicinity (less than 1,000 feet) of the trail crossing. Because of the topography and limited water availability, these riparian features are not connected by surface water to a perennial stream channel.

**Table 102. Changes to Road/Route Densities within Riparian Reserve Buffers by Alternative**

| | Alternative A | Alternative B | Alternative C | Alternative D | Alternative E |
|---|---|---|---|---|---|
| Miles of Designated Trail within riparian reserve buffer[62] | 13.3 | 3.1 | 2.2 | 1.1 | 1.1 |
| Miles of Level II roads closed in riparian buffer | 0 | 1.3 | 4.7 | 5.4 | 5.0 |
| New Stream Crossings | 0 | 0 | 1 | 0 | 0 |
| Miles of Open Road and/or trail within RHCA | 62.5 | 51.0 | 46.8 | 45.0 | 45.4 |
| Miles of road/trail closed/rehabilitated within RHCA buffer | 0 | 11.5 | 15.7 | 17.5 | 17.1 |
| Total Open road/trail density (within RR buffer)mi/mi$^2$ | 1.4 | 1.2 | 1.1 | 1.0 | 1.1 |
| Incorporated Number of User-Created Crossings of mapped riparian[63] | 0 | 6 | 6 | 6 | 6 |

Well-drained pumice soil is common throughout the area. These deep pumice soils allow precipitation to be absorbed into the ground and transported down slope as subsurface flow, and generally not surfacing until reaching a valley bottom. Trail construction and increased trail densities in the uplands more than offset the reduction of trails in the riparian areas. This would result in a no change to water delivery or water quality. Areas of new disturbance have the potential to channelize water, cause erosion, and increase sediment and water delivery to streams during peak flow events, rain on snow events, or during summer thunderstorms. However, these potential effects would be offset or reduced by closure of most user-created trails in the riparian areas, avoidance of most riparian areas altogether, and by

[62]Alternative A displays existing user-created trail.

[63] These designated routes have incorporated appropriate PDFs to protect riparian resources

implementation of Project Design Features (PDFs) identified in Chapter 2. In addition, maintenance of most riparian buffer widths identified in PACFISH/INFISH and the Northwest Forest Plan (two tree lengths for fish bearing streams, one tree length for non fish bearing) would lessen potential for sediment delivery or foreign substances entering a water body. Passive and active restoration of user-created trails allows almost immediate riparian vegetation to begin recovery and provides future protection. Because of the lack of proximity of new trail segments to water features, lack of surface flow connecting new trails with perennial stream channels, and highly porous soils, and maintenance of riparian conditions, there would be no extension of the stream channel network, no effect to water quality, or resident fish or their habitat.

**Cumulative Effects**

The zone of influence is the overlapping watersheds. Past and present actions such as the Baja and BLT vegetation management projects, and the rehabilitation efforts along Big Marsh and the Little Deschutes River have been accounted for in the affected environment and baseline conditions evaluation.

Table 11 (potential past, present, and foreseeable future projects) was reviewed for relevancy and those projects with potential are discussed in the following.

The footprint of the Rim-Paunina project has some overlap with the planning area of the Three Trails OHV project; however there are no perennial streams or fish bearing streams within the Rim-Paunina planning area. Aside from upland conditions, the activities planned adjacent to the relatively few intermittent and ephemeral drainages in the Rim-Paunina planning area can be characterized as restorative. They remove encroaching small diameter lodgepole pine into wet areas and apply prescribed fire where appropriate. In the overlapping uplands, the goal is to restore approximately 16,000 acres of ponderosa pine into a more frequent and low intensity fire regime. For aquatic resources, these activities on top of the Three Trails OHV project area do not change the effects discussed.

In addition, development of the Crescent Creek Wild and Scenic River Plan does not change the effects discussed in this document. Although the plan would afford more protection to the stream corridor and associated canyon, standards and guidelines for OHV use in the new plan did not change from the Interim standard and guidelines. Both the interim and proposed plans limit OHV use to designated routes and this project was planned with the protection of the identified Outstandingly Remarkable Values for wildlife, scenery, and vegetation. See the Wild and Scenic River section in this chapter.

Ongoing past and overlapping projects that rehabilitate degraded riparian areas along Spruce Creek, Hemlock Creek, and Swamp Creek do not change the effects discussed in this document for riparian condition. Activities with these projects include thinning of lodgepole pine encroachment into meadows, spot burning decadent willow clumps, and placing woody material in the stream channel. Although these are important site specific projects, their effect over a watershed or in conjunction with the Three Trails OHV Project is relatively minor.

Due to an ongoing District road monitoring and maintenance program, a failing culvert (collapsed with water flowing over the road prism during snow melt) on FS road 5800620 is scheduled for replacement during the summer of 2010. The 5800620 road is used as a snowmobile route during winter months, connects the Metolius-Windigo Horse Trail and is proposed as an OHV route as part of this project proposal.

Specific aspects of future management of the new adjacent Gilchrist State Forest are not available at this time; however the forest is located mostly in the uplands and has very little connection to water. Also, its stated objectives would be “to maintain the forestlands as managed/working forests and conserve forestlands that could be lost to parcelization and/or development”. Activities would focus on developing

an integrated management plan for recreation, sustainable forestry, and wildlife habitat. Forest management activities would match the Eastern Oregon Regional Forest Management Plan which would likely thin overly dense young forests in the first decade.

Also, details of the new destination resort downstream from the project area are much too speculative at this time; it is currently in the permit application phase and the current economy has the project progress on hold.

There are no more past, present or foreseeable projects that have potential to intensify the effects already discussed.

**Riparian Management Objectives (RMOs)**
While there are six RMOs that need to be addressed for projects located in PACFISH/INFISH areas, there are only two of these that could potentially be affected by the implementation of the action alternatives. Water Temperature and Bank Stability are the two RMOs that would be analyzed for effects to resident trout species. The other RMOs 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 these actions.

The Riparian Management Objectives (RMOs) for PACFISH and INFISH do not allow any measurable increase in water temperature. The Riparian Management Objectives for the Northwest Forest Plan (Aquatic Conservation Strategy) specify water temperatures be maintained or restored to a degree that would provide for a stable and productive riparian and aquatic ecosystem.

**Biological Attributes**
The main biological attributes of concern is the vegetative component of the riparian reserves or riparian habitat conservation areas. It provides shade and large woody debris (overstory) for the stream and sediment filtering capacity in the form of understory brushes and grasses, along with bank protection and stabilization for both overstory and understory vegetation.

> From a site specific and watershed perspective, implementation of all action alternatives would have an overall beneficial effect on Aquatic Conservation Strategy Objectives and Riparian Management Objectives by moving the project area toward the natural range of variability for the biological components.

The physical components (channel type and floodplain) would remain unchanged. However, the biological components would be most affected by the activities from a reduction in motorized access directly to the stream bank edge and a reduction of cross-country travel. The overall reduction in trails and roads in proximity to water within the riparian reserve/RHCA would increase vegetative cover and decrease erosion. This would allow vegetative recovery of grasses, forbs, and brush species which provides a filter or “buffer” to catch potential sedimentation before it makes it to the stream. Also, restoration activities would have a small contribution to an increase in understory vegetation which has potential to intercept solar radiation and provide shading along with bank stabilization.

The direct reduction in user-created riparian trails would decrease potential for overland flow and subsequent erosion. As these areas recover through active and passive restoration activities, vegetation would begin to establish within one to two growing seasons and provide additional bank stabilization.

For water temperature, the Riparian Management Objective specifies no measurable increase in maximum water temperatures is allowed, which is maximum temperatures below 59°F for adult holding habitat and 48°F for spawning and rearing habitats. It was determined that movement of trails away from water and subsequent restoration activities associated with passive and active vegetative recovery would intercept solar radiation on a very small scale (less than one percent for the total reach) and make overall

progress towards this Riparian Management Objective and is relevant to all Aquatic Conservation Strategy Objectives.

### Consistency with Odell and Big Marsh Tier 1 Key Watersheds

The project area overlaps two Tier 1 Key Watersheds; Big Marsh and Odell (Figure 33). Tier 1 Key Watersheds is a component of the Aquatic Conservation Strategy. They provide high quality habitat for at-risk stocks of resident fish species. They are to serve as refugia for maintaining and recovering habitat for these at-risk species. The key watershed designation overlaps other management allocations (NWFP, p B-18).

Odell Creek contributes directly to the conservation of the threatened bull trout. There are resident fish populations in both Key Watersheds (reference Aquatic Resources section in Chapter 3).

The NWFP specifies standards and guidelines for Key Watersheds that prohibit or regulate activities that retard or prevent attainment of the ACS Objectives. The following outlines the project consistency with these guidelines:

- No new roads will be built in remaining unroaded portions of Inventoried Roadless Areas located in Key Watersheds. *No new roads would be constructed in both Key Watersheds.*

- Outside roadless areas reduce existing system and non-system road mileage. If funding is insufficient to implement reductions, there will be no net increase in the amount of roads in Key Watersheds. *Although there is a net decrease in open roads in each Key Watershed , the roads remain in closed status to provide administrative access for activities such as fire suppression. Therefore, there is no net increase in the amount of roads.*

- Key Watersheds have the highest priority for restoration. *All action alternatives include restoration activities that move recreation associated with motorized travel away from water and prohibit cross country travel.*

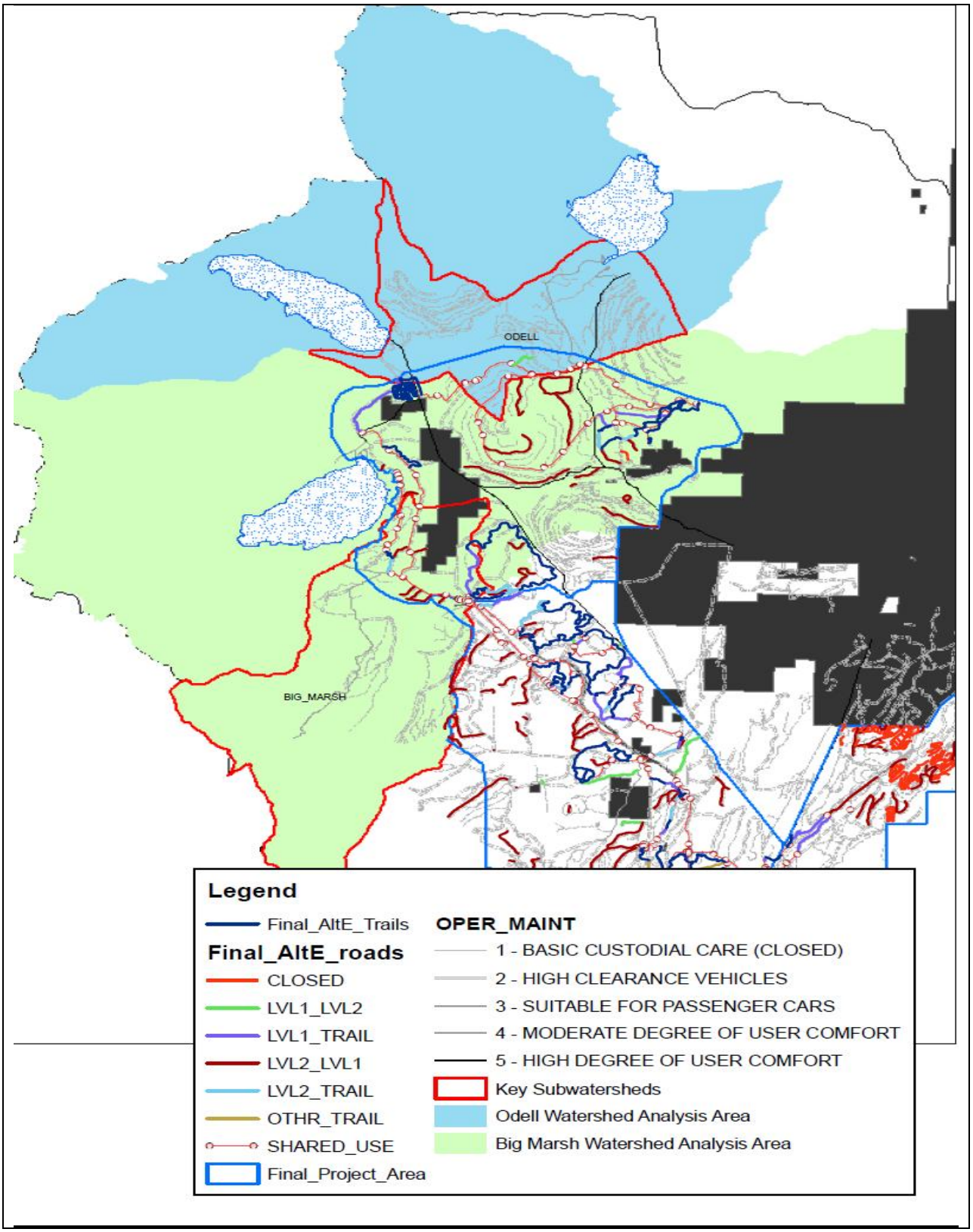


**Figure 33. Overlap of Big Marsh and Odell Tier 1 Watersheds onto the Project Area**

## Aquatic Conservation Strategy

The Aquatic Conservation Strategy ((ACS) 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 projects that are implemented on National Forest lands within the Northwest Forest Plan areas "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.

All action alternatives would be consistent with Aquatic Conservation Strategy (ACS) objectives. ACS objectives would be met by improving motorized travel-related conditions in the watershed. These conditions have the highest probability for affecting water quality by being a potential source of fine sediment erosion and the loss of riparian vegetation. These actions include rehabilitation of user-created trails that are not used for the designated trail system and an overall reduction in road densities in the reserve. All road closures would be physically closed, periodically monitored for proper hydrologic function and removed from the NVUM map. No obliteration would occur on Maintenance Level 1 or 2 roads.

Prohibition of travel off of designated routes would allow for passive recovery of a vegetated condition which would begin immediately and it would reverse a trend of potential future degradation created by access and motorized traffic. Total open road density on National Forest System Roads drops from 3.8 to 2.0 miles per square mile averaged over 16 subwatersheds (Table 82). Use would be directed to occur in more appropriate and sustainable areas where potential effects can be confined, monitored, and or remedied if an undesirable circumstance occurs. With use confined to designated routes, all perennial and intermittent stream crossings would occur on existing Forest Service roads engineered using Best Management Practices. Alternative C and the new OHV bridge crossing would also employ Best Management Practices for the design and construction of the new crossing. Effects of use, whether it be OHV or passenger car, would be the same. Therefore, the effects of moving OHV crossings to existing Forest Service roads would reduce potential for sediment delivery, bank erosion, and riparian vegetation loss.

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 cross-country travel. The following section outlines a generalized description of the natural range of variability for important physical and biological components.

It also is used to describe expected vegetative conditions adjacent to the stream that could be potentially affected by this project.

***Summarized ACS Objectives and Effects of the Action 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.**

As detailed in the summary, all action alternatives generally move potential effects away from aquatic systems by designating routes in the uplands and actively restore user-created trails and parking areas with native vegetation. From a landscape perspective, these activities can be characterized as

"maintaining or restoring" the distribution, diversity, and complexity of the watershed and landscape features.

**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 would not affect the spatial or temporal connectivity within and between watersheds in any action alternative. They could be characterized as restoring connectivity in floodplains, wetlands, and refugia because of the passive and active establishment of native riparian vegetation would improve connectivity for riparian dependent species. To facilitate this, decompaction of soils that have experienced years of use from motorized vehicles within the riparian zone would restore proper hydrologic function. In the upland slope areas, trail widths average a relatively narrow 50 inches which does not fragment habitat for most species (reference the Wildlife discussion in Chapter 3) and is more than offset by a reduction of road densities in almost all the sub watersheds.

Alternative C includes a new OHV bridge crossing of the Little Deschutes River, a perennial stream channel. This crossing would span the channel and not interfere with the free flowing nature of the river. Four crossings of ephemeral draws may occur if avoidance is not possible. These drainages are truncated within a few hundred feet at a railroad prism and there is no surface connectivity to any other channel feature. All other stream/wetland/riparian crossings such as the Metolius-Windigo trail separation, an additional crossing immediately adjacent to the railroad tracks (Figure 32) and all staging areas have been designed with Project Design Features to maintain hydrologic and biological connectivity.

**3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.**

Alternatives B-E maintains and restores the physical integrity of the aquatic systems by moving motorized use away from wet areas and especially away from the banks of the Little Deschutes River. This allows passive and active re-vegetation which results in a more stable condition for a local and watershed perspective.

**4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.**

Due to the very small affect this project would have on water quality on a site specific and watershed scale, much of the analysis has concluded many effects are "immeasurable". However, it can be demonstrated that the restorative actions accomplish more benefits than simply maintaining the status quo. The Little Deschutes River is listed as 303(d) for temperature. Every activity proposed within each action alternative would improve sediment potential over the existing condition because it moves motorized use away from water and improves overall riparian filtering capacity. Alternative C removes a few trees in construction of a bridge, but it does not remove enough trees to affect temperature and it is more than offset by the other actions that restore vegetation with potential to intercept sunlight. It was concluded that all the action alternatives did not change the 303(d) parameters for which the Little Deschutes River is listed impaired.

For Crescent Creek, due to the remote terrain associated with a considerable portion of the corridor and the lack of motorized access, plus the very limited designation of road and trail within the Crescent Creek corridor, none of the action alternatives would affect 303(d) parameters. The 303(d) listing is mainly due to impoundment and flows released from the dam. Water quality standards cannot be met without restoring streamflows. Due to the remote nature of a considerable segment of Crescent Creek, there are very few user-created trails or dispersed camps that have potential to affect these parameters.

**5. Maintain and restore the sediment regimes under which aquatic ecosystems evolved**.

All action alternatives can be characterized as restorative of the sediment regime. Reference #2 and #4.

**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.**

None of the action alternatives would have any effect on instream flow as soils in the planning area are highly porous and surface drainage densities are low. This project would not increase the drainage network above establishment of additional riparian vegetation and it would not increase the delivery rate of water to the stream channel(s).

**7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands**.

Although the action alternatives have no effect on the timing, variability, or duration of floodplain inundation, it has the potential to elevate water tables on small and localized scales where restorative activities decompact soils and establish vegetation immediately adjacent to the Little Deschutes River.

**8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands.**

For Alternatives B-E this project would contribute to the accomplishment of this objective at the site specific scale as limiting access to motorized vehicles in riparian areas and wetlands. It would allow for compositional and structural plant diversity to be maintained or increased as areas that are currently impacted from vehicular access would be actively replanted with native vegetation.

**9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian dependent species.**

This objective is directly related to #8. Restoration activities include planting of native species appropriate for the site. Native sedges, alder, and aspen are some of the vegetative species that would be planted within the user-created trails and parking areas within the riparian zone.

# Botany

## Threatened, Endangered, and Sensitive (TES) Plant Species

The following analysis for botanical resources hereby incorporates the specialist report in its entirety. The zone of influence for bounding the effects is the project area; more specifically the motorized routes within the Three Trails OHV system. All past and present activities have been incorporated into the analysis because it is the most informative way to disclose effects. This analysis also incorporates by reference, the BLT FEIS 2009, USDA FS.

The pre-field review consisted of checking existing records for documented occurrences of any proposed, endangered, threatened, or sensitive plant species within the Three Trails OHV planning area. The pre-field review incorporated the following data sources:

- Regional Forester's (R-6) Sensitive Plant Species List (January 31, 2008)
- Oregon Natural Heritage Program: Rare, Threatened and Endangered Species List (ORNHIC 2004 and 2007)
- NRIS (Natural Resource Inventory System) database for the Deschutes National Forest: Element Occurrence records for TES plants and Invasive plants (updated February 2009)
- Geographical Information System (GIS) Sensitive Plant and Noxious Weed layer for the Deschutes National Forest (updated 1/28/2009)
- Botany Survey Records, Crescent Ranger District

Pre-field reviews of existing records were conducted in October 2008 and February 2009 for the Three Trails OHV project area. **The reviews indicated there were no known occurrences of federally-listed Threatened and Endangered plants.** However, there were several occurrences of pumice grape-fern, which is an Oregon state-listed Threatened plant species within the project area. (Refer to Table 103 for a summary of the Deschutes/Ochoco PETS plant list with potential habitat.)

Known Sensitive Plant Occurrences

Of the 74 species listed on the Deschutes/Ochoco Sensitive Plants list, four Sensitive plant species have been documented within the project area (Table 103) pumice grapefern (*Botrychium pumicola*), slender woolly sedge (*Carex lasiocarpa* var. *americana*), forest brownwort (*Tritomaria exsectiformis)*, and tomentypnum moss (*Tomentypnum nitens).*

**Table 103. Pre-field Review Summary of 2008 Sensitive Plant List for the Three Trails OHV Planning Area**

| R6 Sensitive Plant Species Documented or Suspected on the Deschutes National Forest | Range | Habitat | Known occurrence on Crescent District? On Forest? | Probability of Occurrence in Project Area |
|---|---|---|---|---|
| *Agoseris elata* (vascular plant) | Washington and Oregon Cascades | Forest openings and forest edges adjacent to wet/moist meadows, lakes, rivers, and streams | No/Yes | Low; habitat marginal |
| *Alpova alexsmithii* (fungus) | Cascades, Central OR to WA | Associated with various Pinaceae sp., incl. Pacific silver fir, lodgepole, Engelmann spruce, and mountain hemlock | No/Yes | Moderate; suitable habitat present |

| R6 Sensitive Plant Species Documented or Suspected on the Deschutes National Forest | Range | Habitat | Known occurrence on Crescent District? On Forest? | Probability of Occurrence in Project Area |
|---|---|---|---|---|
| *Arabis suffrutescens* var. *horizontalis* (vascular plant) | South-Central Oregon | Meadows, woulds, summits, ridges, and exposed rock outcrops | No/No | Low; outside known range |
| *Arnica viscosa* (vascular plant) | South-Central Oregon Cascades, California | Scree, talus gullies, lava flows and slopes w/ seasonal runoff. May be in moraine lake basins or crater lake basins | No/Yes | Low; habitat marginal |
| *Astragalus peckii* (vascular plant) | South-Central Oregon | Basins, benches, gentle slopes, and meadows. | No/Yes | Low; habitat marginal |
| *Barbilophozia lycopodiooides* (liverwort) | Circumboreal, south to Oregon and Idaho | High elevation peaks, peaty soil | No/No | None; no habitat present |
| ***Botrychium pumicola*** (vascular plant) | Central Oregon | Alpine-subalpine ridges, slopes, and meadows. Lodgepole forests in basins with frost pockets, pumice flats | **Yes/Yes** | **14 known occurrences in Walker subunit** |
| *Brachydontium olympicum* (moss) | Alaska through Oregon, Cascade Mountains | Subalpine to alpine boulder fields, moraines and cliff faces | No/No | None; no habitat present |
| *Calamagrostis breweri* (vascular plant) | Oregon North Cascades and California | Non-forest moist-to-dry subalpine and alpine meadows, open slopes, streambanks, lake margins | No/No | Low; no habitat present |
| *Carex abrupta* (vascular plant) | Oregon, California, Nevada | Montane, forests, meadows and open slopes. Usually dry soils | No/No | Low, habitat marginal |
| *Carex capitata* (vascular plant) | Circumboreal | Wet meadows, fens and bogs | No/Yes | Low; no trails in riparian areas |
| *Carex diandra* (vascular plant) | Circumboreal, south to California | Swamps, sphagnum bogs, lake margins | No/No | Low; no trails in riparian areas |
| ***Carex lasiocarpa var. Americana* (vascular plant)** | **S Cascades of Washington, Idaho, Montana, Utah, irregularly to Oregon** | **Mid elevation swamps and wet meadows** | **Yes/Yes** | **1 known site within Junction subunit** |
| *Carex livida* (vascular plant) | Oregon Washington, California, Idaho | In peatlands, including fens and bogs; wet meadows with still or channeled water | No/No | Low; no trails in riparian areas |
| *Carex retrorsa* (vascular plant) | Nevada, Oregon, Washington, Idaho, to the north and east | Bogs, swamps, wet meadows, stream margins | No/No | Low; no trails in riparian areas |
| *Carex vernacula* (vascular plant) | Washington, Oregon, California, Idaho | Alpine, moist meadows, open slopes | No/No | None; no habitat present |
| *Castilleja chlorotica* (vascular plant) | Oregon east Cascades | LP-PP, mixed conifer forest openings. PP at lower and LP at mid, and mixed conifer at highest elevations | No/Yes | Moderate; suitable habitat present |
| *Cheilanthes feei* (vascular plant) | Widespread western states, barely in Oregon | Limestone rocky areas | No/No | Low; no trails through rocky outcrops |
| *Chyloscyphus gemmiparis* (liverwort) | Oregon, Alaska, Utah | High elevation montane streams, aquatic | No/No | Low; no habitat present |
| *Collomia mazama* (vascular plant) | South-Central Cascades, Oregon | Meadows (dry to wet, level to sloping); stream banks and bars, lakeshores and vernal pool margins; forest edges and openings; alpine slopes | No/No | Low; outside known range |
| *Conostomum tetragonum* (moss) | Circumboreal; from BC through California | Subalpine to alpine boulder fields, moraines, and cliff ledges | No/No | None; no suitable habitat |
| *Cyperus acuminatus* (vascular plant) | Western states, west cascades Oregon | Margins wet areas, lake edges | No/Yes | Low; no trails in riparian areas |
| *Cyperus lupulinus* ssp.*lupulinus* (vascular plant) | Idaho, Eastern Washington, Oregon | Rocky slopes adjacent to streams, low elevation | No/No | Low; habitat unlikely |

| R6 Sensitive Plant Species Documented or Suspected on the Deschutes National Forest | Range | Habitat | Known occurrence on Crescent District? On Forest? | Probability of Occurrence in Project Area |
|---|---|---|---|---|
| *Dermatocarpon luridum* (lichen) | Oregon, Washington | On rocks or bedrock in streams or seeps, usually submerged or inundated for most of the year | No/No | Low; no trails through streams |
| *Elatine brachysperma* (vascular plant) | Washington, Oregon, California, Nevada | Wet to drying muds | No/No | Low; no trails in riparian areas |
| *Eucephalus gormanii* (vascular plant) | Northern West Cascades | Rocky ridges, outcrops, or rocky slopes | No/Yes | Low; no trails through outcrops |
| *Gastroboletus vividus* (fungus) | Rogue River N.F., Crater Lake NP, CA | Associated with the roots of Pinaceae sp. such as Shasta red fir and mountain hemlock | No/No | Low; outside known range |
| *Gentiana newberryi* var. *newberryi* (vascular plant) | Oregon east and west Cascades, California | Wet to dry alpine, subalpine, and mountain mixed conifer zones, in forest openings and meadows, commonly with tufted hairgrass | No/Yes | Low; habitat marginal |
| *Helodium blandowii* (moss) | Circumboreal, south through Cascades to Sierra Nevada, and through Rockies to Arizona | Montane fens with calcareous groundwater. | Yes/Yes | None; restricted to fen habitats |
| *Heliotropium curassavicum* (vascular plant) | Western United States | Alkaline, saline playas, receding ponds and clay soils | No/No | Low; no trails through riparian areas |
| *Helvella crassitunicata* (fungus) | Cascades, central Oregon to northern WA | On soil, along trails in montane regions with sp. such as Pacific silver fir, grand fir, and mountain hemlock | No/No | Low; suitable habitat not present |
| *Hygrophorus caeruleus* (fungus) | Cascades, central Oregon (Jefferson Co.) to central WA | On soil in association with roots of Pinaceae sp. near melting snowbanks | No/Yes | Low; outside known range |
| *Leptogium cyanescens* (lichen) | Oregon, Washington | Generally riparian but recently documented in upland settings on vine maple, big leaf maple and Oregon white oak | No/No | Low; no trails in riparian areas |
| *Lipocarpha aristulata* (vascular plant) | Washington, Oregon, California, Idaho | Low elevation streamsides, gravel bars | No/No | Low; no trails through riparian areas |
| *Lobelia dortmanna* (vascular plant) | Oregon East Cascades, Washington | Shallow water at margins of lakes, ponds, and rivers or in standing water of bogs and wet meadows | No/Yes | Low; no trails through riparian areas |
| *Lycopodiella inundata* (vascular plant) | Oregon, Idaho, California, Montana – Circumboreal | Deflation areas in coastal backdunes; montane bogs, including sphagnum bogs; less often wet meadows | Yes/Yes | Low; restricted to lakeshore habitats |
| *Lycopodium complanatum* (vascular plant) | Oregon, Idaho, Washington + | Edges of wet meadows; dry forested midslope with >25% canopy cover | No/No | Low; habitat marginal, outside known range |
| *Muhlenbergia minutissima* (vascular plant) | Western United States | Thin lava soils, associated with Typha, sedges | No/No | Low; habitat unlikely |
| *Ophioglossum pusillum* (vascular plant) | Oregon, Washington, California, Idaho + | Dune deflation plains; marsh edges; vernal ponds and stream terraces in moist meadows | No/No | Low; trails not in riparian areas |
| *Penstemon peckii* (vascular plant) | Central Oregon east Cascades | PP openings, open PP forests; mixed conifer openings; recovering fluvial surfaces | No/Yes | Low; outside known range |
| *Pilularia americana* (vascular plant) | Oregon, California + | Alkali and other shallow vernal pools, not recently used stock ponds, reservoir shores | No/No | Low; no trail in riparian areas |
| *Polytrichum sphaerothecium* (moss) | East Asia-Western North America through Alaska to Oregon; highest Cascade peaks | Subalpine to alpine, forming green to brown sods on igneous rocks in exposed or sheltered sites. | No/No | Low; no suitable habitat |

| R6 Sensitive Plant Species Documented or Suspected on the Deschutes National Forest | Range | Habitat | Known occurrence on Crescent District? On Forest? | Probability of Occurrence in Project Area |
|---|---|---|---|---|
| *Potamogeton diversifolius* (vascular plant) | Oregon, Idaho, Nevada, California | Aquatic, Pond edges, | No/No | Low; no trails in riparian areas |
| *Pseudocalliergon trifarium* (moss) | Circumboreal; British Columbia, Alberta, Montana, Oregon | Montane fens, submerged to emergent or on saturated ground, usually in full sunlight | No/No | Low; restricted to fen habitats |
| *Ramaria amyloidea* (fungus) S&M | Central OR Cascades (Wouldiamette and DES NF); WA Cascades, NW CA | Mycorrhizal with true firs, Douglas fir, and western hemlock in humus or soil. | Yes/Yes | Moderate, suitable habitat present |
| *Rhizomnium nudum* (bryophyte) S&M | Oregon, Washington + | Moss found in moist coniferous forests. On DNF associates include lodgepole pine, Engelmann spruce, mountain hemlock, and western white pine | No/Yes | Moderate; suitable habitat present, not yet documented on Crescent |
| *Rorippa columbiae* (vascular plant) | Oregon, California, Washington | Wet to vernally moist sites in meadows, fields, playas, lakeshores, intermittent stream beds, banks of perennial streams, along irrigation ditches, river bars and deltas, roadsides. | Yes/Yes | Low; suitable habitat unlikely |
| *Rotala ramosior* (vascular plant) | Washington, Oregon, California, Idaho | Low elevation low gradient shores, pond edges, river bars | No/No | Low; no trails in riparian areas |
| *Scheuchzeria palustris* var. *americana* (vascular plant) | Oregon, Washington, California, Idaho + | Open to canopied bogs, fens, and other wetlands where often in shallow water | Yes/Yes | Low, restricted to fen habitats |
| *Schistostega pennata* (bryophyte) S&M | Oregon, Washington, circumboreal | Mineral soil in crevices on lower and more sheltered parts of root wads of fallen trees near streams or other wet areas | Yes/Yes | Moderate; restricted to specific habitat |
| *Schoenoplectus subterminalis* (vascular plant) | Oregon, Washington, California, Idaho + | Generally submerged to emergent in quiet water 2-8 decimeters deep, in peatlands, sedge fens, creeks, ditches, ponds and lakes | No/Yes | Low; restricted to aquatic habitats |
| *Scouleria marginata* (bryophyte) S&M | Pacific Northwest endemic; Oregon, Washington, Idaho, northern California, southwestern British Columbia | Exposed or shaded rocks in streams; seasonally submerged or emergent | No/No | Low; restricted to aquatic habitats |
| *Splachnum ampullaceum* (moss) | Circumboreal; from Alaska through Oregon, and Alberta | Peatlands, wetlands, on old ungulate dung | No/No | Low; restricted to wetlands |
| *Texosporium sancti-jacobi* (lichen) | Western North America | In Oregon, late seral dry shrub/grassland | No/No | Low; no habitat in project area |
| ***Tomentypnum nitens*** (moss) | Circumboreal, Alaska through Oregon | Montane fens at slightly elevated (stumps, logs, hummocks) | Yes/Yes | **1 known site, restricted to fen habitat** |
| *Trematodon boasii* (moss) | British Columbia through California, Japan, Newfoundland | Subalpine stream, trail and pond edges. | No/No | Low; no suitable habitat present |
| ***Tritomaria exsectiformis*** (liverwort) | Alaska through Oregon, to Montana, Wyoming and Colorado | Open to shaded coniferous forest along perennial flowing water from springs and seeps | Yes/Yes | **1 known site, restricted to fen habitat** |
| *Utricularia minor* (vascular plant) | Western United states north through Canada | Aquatic plant of pools, ponds, bogs, marshes, wet meadows | Yes/Yes | Low; restricted to aquatic habitats |

**Table 104. Known Occurrences of R6 Sensitive Plants within the Three Trails OHV Project Area**

| Species | Documented Site Number | Location |
|---|---|---|
| *Botrychium pumicola* pumice grapefern | 0200507 to 0200518, 0200171, 0200098 | Walker area – BPA powerline |
| *Carex lasiocarpa* var. *americana* slender woolly sedge | To be assigned | Junction area -Royce Butte Fen |
| *Tritomaria exsectiformis* liverwort | USFS0600 EO 56884 | Junction area - Dell Springs |
| *Tomentypnum nitens* tomentypnum moss | To be assigned | Junction area - Crescent Fen |
| *Tomentypnum nitens* tomentypnum moss | 06010200010 | Junction area - Dell Springs |

**Pumice grape-fern**

**Ecology**

Pumice grape-fern is a diminutive plant (two to six inches tall) that is endemic to central Oregon and found no where else in the world. It has a leathery, pale-green leaf on one stalk, with a second stalk that holds small bunches of 'grape-like' structures that contain spores (USFS 2001). Pumice grape-fern is closely associated with the loose, volcanic soils of central Oregon. It is found in pumice soil in two habitat types: in open, frost pockets within montane lodgepole forests (*Pinus contorta*), and on rocky summit slopes on alpine ridges (Powers 2008).

Pumice grape-fern is a perennial plant that does not appear above ground every year. The plants generally emerge above ground in mid-May; the spores mature and separate from the plant in late July. After the spores have been released, the plant dies back and overwinters about two inches underground. For the spores to develop, they require complete darkness, as well as a mycorrhizal (i.e. fungal) partner (Johnson-Groh et al. 2002). This is essential for the plant to receive carbohydrates, minerals, and water critical to its survival. Without this mycorrhizal connection, the grape-fern plant would not live. Because of this fungal connection, the grape-fern is able to live underground for one to three years without sending up an above-ground, photosynthetic portion with no apparent loss of size or other negative effects (Johnson-Groh et al. 2002). It may take 5-8 years for a grape-fern's life cycle process to occur (i.e. for a spore to turn into an above-ground spore-bearing plant), according to research conducted on other *Botrychium* species (Johnson-Groh 1998).

The disturbance ecology of pumice grape-fern is not well understood. There has been only one documented study (Amsberry 2003) that has examined the effects of disturbance on this species. The results of this study found that plant burial is detrimental, while clipping and shading do not affect plant emergence. The study also found that recovery from mild scraping and compaction is possible. From observations made by botanists over the past decade, it appears that pumice grape-fern is not maintained by disturbance, but can recover from mild site disturbance, if the soil horizons are not displaced and the disturbance is not recurring (Powers 2008).

**Existing Condition**

There are about 548 occurrences of pumice grape-fern in central and south-central Oregon, with the total number of plants estimated at a conservative 26,882 (Powers 2008). It is listed as "Threatened" by the Oregon Department of Agriculture, and is on the Oregon Natural Heritage Program's (2004) list 1: "taxa which are endangered or threatened throughout their range or which are presumed extinct".

On the Deschutes National Forest, there are 433 documented occurrences of pumice grape-fern, with approximately 16,360 individuals (Powers 2008). The majority of these sites are on the Bend Ft. Rock District, with occurrences on Broken Top, Mt. Bachelor, Newberry Crater, and the Katai Basin.

On the Crescent Ranger District, occurrences of pumice grape-fern are located in the southeast region of the District, and in a lodgepole matrix near Highway 31.

Within the Walker subunit of the Three Trails OHV project area, there are 14 known occurrences of this species. Botanical records from the late 1990s had documented a total of 97 individual plants at these sites (NRIS 2009). Focused surveys in 2008 of these same sites documented a few hundred plants.

The abundance of pumice grape-fern under the BPA powerline is due to the amount of available habitat for this species. BPA keeps the powerline area clear of vegetation through manual tree and brush cutting, which maintains the open habitat that pumice grape-fern prefers. There is an existing road (Forest Service road 012) that runs underneath the powerline, and is currently used extensively for OHV travel. Observations made during 2008 botany surveys did record evidence of mild vehicle disturbance (tread marks) at one of the pumice grape-fern sites. No other signs of human-caused disturbance were seen at the other grape-fern sites.

**Tomentypnum moss (R6 Sensitive)**

**Ecology and Existing Condition**

This moss species is found exclusively in moist, fen[64] habitats of mid to high elevation coniferous forests (NatureServe 2009). *Tomentypnum nitens* is one of the more conspicuous of several species of so-called "brown mosses" that occur in mineral-rich fens. It is distinguished from other fen mosses by its golden-brown leaves and feathered appearance. *T. nitens* forms loose or dense sods or is intermixed with other bryophytes in medium to rich montane fens where it favors slightly elevated sites such as logs, stumps, or hummocks formed by bog blueberry (*Vaccinium uliginosum)* and bog birch (Christy 2007).

There is scant scientific literature concerning the ecology of *T. nitens*, especially in terms of potential threats. The growth of *T. nitens* is controlled by the balance between evaporation rate and transport of water from the water table to the canopy surface (Busby et al. 1978). Because this species is restricted to wetland habitats, the most obvious threat would be the loss of habitat or disruption of site hydrology. Other potential threats to the global population include livestock grazing, commercial peat harvesting, and conversion of peatlands to forest (Christy 2007). There is no livestock or commercial peat harvest on Federal Lands within the Crescent Ranger District which encompasses the Three Trails OHV project area.

*T. nitens* is a circumboreal species, being rare south of the Canadian border in Oregon and Washington, where it is at the southern edge of its range in the Pacific Northwest (Christy 2007). This species has been documented on the Deschutes, Fremont-Winema, and Umpqua National Forests, and at Crater Lake National Park. On the Deschutes National Forest, there are 19 documented sites of *T.nitens*, all of which are restricted to fen habitats (NRIS 2009). On the Crescent Ranger District, new occurrences of this species have recently been discovered in 2008 and 2009 in fens near Odell Lake (Maklak area), Crescent Lake, and Big Marsh.

[64] Fens are peat-forming wetlands that receive nutrients from sources other than precipitation usually from upslope sources through drainage, from surrounding mineral soils, and from groundwater movement (EPA 2008).

Within the Junction subunit of the Three Trails OHV project area, *T. nitens* was found in 2006 in a spring located near Highway 41. This is a spring-fed riparian area that appears to be hydrologically stable (Dewey per. comm. 2009). Although *T. nitens* is abundant at other sites on the Deschutes, this is not the case for the population at Dell Springs (Dewey per. comm. 2009). Adjacent to the spring area is a popular hunter's camp which is used every year in the fall. Observations made of the area in 2008 indicated that the only human-caused disturbance within the spring area was an old road that crossed the center of the riparian area, and did not impact any of the *T. nitens* plants.

Another occurrence of tomentypnum moss was found in 2009 in a fen near Crescent Lake which is within the Three Trails OHV planning area. This fen has been impacted by human disturbance, which include railroad tracks and Forest Service road 620, both of which traverse the western edge of the wetland. The 5800620 road is used primarily has a winter snowmobile route, and is gated (at both ends) during the summer and fall. During field surveys conducted in 2009, there was no evidence of any OHV disturbance within the fen. Project Design Features to be incorporated would include fencing along the roadside, adding informative signs, and monitoring.

**Forest Brownwort**

**Ecology and Existing Condition**

*Tritomaria exsectiformis* is a tiny liverwort that is associated with spring-fed hydrologic regimes. This species is an arctic-alpine, circumboreal bryophyte that appears to be quite rare in the Pacific Northwest (NatureServe 2009). This species has been found on the Deschutes, Umpqua, and Willamette National Forests, and is suspected to be on other forests in the Cascade Range. *T. exsectiformis* has been found on peaty or humic soil, on rotting wood, often on creek banks where it is perpetually shady, cool, and moist (Harpel and Dewey 2005). Typically, its habitat is open to shaded coniferous forest in association with low volume, perennial water flow at or near springs and seeps, along very gentle topographic gradients. Substratum is most commonly decay class four, occasionally decay class three or five, down wood that generally is in direct contact with water. Key habitat elements appear to be hydrologic stability (low, steady flow, no scouring) and substrates that would serve as wicks for a water supply that is continuously available during the snow-free period of the year (Harpel and Dewey 2005). It may also be important that the surface water associated with *T. exsectiformis* locations, being generally spring-fed, is usually very cold. Associated bryophyte species may include *Lophozia incisa, L. ventricosa, Blepharostoma trichophyllum, Calypogeia muelleriana, Cephalozia lunulifolia,* and *Lepidozia reptans* (Harpel and Dewey 2005). Potential threats to this species are loss of wetland habitat, disruption of spring hydrology, and loss of downed would recruitment.

On the Deschutes National Forest, there are 12 documented sites of *T. exsectiformis* (NRIS 2009). Within the Junction subunit of the Three Trails OHV project area, *T. exsectiformis* has been documented within a spring-fed riparian system. This occurrence consists of only a few plants that are growing both on decayed wood and on wet peat (Dewey per. comm. 2009). This site of *T. exsectiformis* would be at risk of decline due to possible periodic sub-normal groundwater years. Even one significantly sub-normal water year could be detrimental for the *T. exsecitformis* plants, as they seem to be highly susceptible to desiccation (Dewey per. comm. 2009). There are no designated trails in the spring-fed riparian system in the Junction subunit.

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**Slender Woolly Sedge (R6 Sensitive)**

**Ecology and Existing Condition**

Slender woolly sedge (*Carex lasiocarpa* var. *americana)* is an aquatic sedge that is widely found throughout the United States, Canada, and Eurasia. It is found in very wet sites such as fens, bogs, lakeshores, streambanks, and in wet meadows (eFlora of North America 2009). This species is also known to form floating mats in deep, organic peatlands. Elevation for this species ranges from sea level to 1300 m. Slender woolly sedge is often a community dominant of fens and bogs, where it can form large stands. It is very similar to the more common woolly sedge (*Carex pellita*), but is distinguished

from the latter by having narrow leaves that are more or less triangular, with tips that curl (Wilson et al. 2008). The two species can grow together, with *C. pellita* being a shorter plant that occupies shallower water (Wilson et al. 2008) than *C. lasiocarpa*. Because slender woolly sedge is restricted to aquatic habitats, it is sensitive to hydrologic changes. Off-road vehicles can seriously damage the deep organic soils that slender woolly sedge grows in (Wilson et al. 2008).

On the Deschutes National Forest, slender woolly sedge has been documented on the Bend-Ft. Rock District, where it was found growing along the Deschutes River. On the Crescent District, slender woolly sedge is known from a large population in the southwestern region of the District. In 2009 this species was also found in the Junction subunit of the Three Trails OHV project area.

**Survey Methods and Results**

Botanical surveys were conducted in part of the Three Trails OHV analysis area during the summer of 2009. These were plant surveys for TES and invasives plants in planned thinning and prescribed fire projects for 2009. The exception to this was focused surveys of the known pumice grape-fern sites in the Walker subunit under the BPA powerline. For the pumice grape-fern surveys, each site was relocated, with all individuals flagged and counted, with the population boundary recorded using GPS equipment (NRIS 2009; Crescent botany survey records 2008).

Additional surveys were conducted in 2009 for occurrences of candystick (*Allotropa virgata*), which is an indicator species for the matsutake mushroom (*Tricholoma magnivelare)*, a Plant Species of Concern on the Crescent District. These surveys were conducted in a known area of high matsutake production within the Rivers subunit (NRIS surveys 2009).

For the general botanical surveys, both vascular and non-vascular species were documented, with the exception of fungi. (Surveys were considered impractical for fungi.) While not specific to the Three Trails OHV planning area, these general surveys did overlap into all three of the subunits of the analysis area.

If any TES plant species are discovered during such surveys, then the appropriate actions would taken to adjust the trail to avoid disturbance of these species. This protocol would also be used to avoid occurrences of sugarstick and matsutake mushroom, both of which are considered Plant Species of Concern on the Crescent District.

**Measures**

The following measures would be used to compare the alternatives for effects.

- Habitat acres open to motorized travel off of designated routes
- Acres of existing Sensitive plant sites in areas open to motorized travel

**Methodology**

To analyze the effects of alternatives on the impact to TES plant species, known population sites and their habitat were overlaid onto the proposed road and trail system for each alternative.

**Assumptions**

- Habitat for Sensitive plant species within the Crescent District is limited to site-specific areas
- None of the Alternatives proposes trails through wetlands
- OHVs would be limited to designated roads and trails
- A 2.5 to 5.6 percent yearly increase in riders
- Additional botanical surveys would occur prior to trail construction

**Direct and Indirect Effects**

Numerous studies have documented the ecological effects of roads and trails, especially those effects associated with OHV recreation (Forman and Alexander 1998; Stokowski and LaPointe 2000; Ouren et al. 2007). The most obvious impacts to vegetation from off-road vehicles is the smashing and breaking of plants as vehicles drive over them (Wilshire et al. 1978; Webb 1983). The severity of damage to vegetation from vehicles is related to the amount of use that a given area is receiving from OHV use. As the number of vehicle passes increases, an increase in the impact to vegetation is also seen (Adams 1982; Payne et al. 1983; Bolling and Walker 2000). Such impacts have been shown to reduce the cover of native vegetation in OHV areas (Bolling and Walker 2000). When rare plants are present in OHV areas, motorized use can detrimentally impact plant populations by reducing the number and cover of individual plants (Groom et al. 2005).

This is a direct effect from tires crushing plant material, but also to soil properties. Even a few passes of a vehicle can compact soil, and repeated use leads to severely compacted and disturbed soils. Such soil compaction can lead to a considerable reduction in vegetation cover, with native plant establishment impaired (Web et al. 1978; Adams 1982; Lovich and Bainbridge 1999; Bolling and Walker 2000). Soil compaction can also increase the potential for non-native, invasive plants to displace native vegetation (Prose et al. 1987; Lovich and Bainbridge, 1999).

The dirt and dust associated with OHV roads and trails can also effect the trailside vegetation (Brooks and Lair 2005). Dust accumulation on plants can impair crucial plant functions such as photosynthesis and transpiration, which can lead to reduced plant growth, recruitment, cover, and survivorship (Walker and Everett 1987).

Pumice grape-fern - There has been only one study that has specifically examined the effects of disturbance on pumice grape-fern (Amsberry and Meinke 2002). This study, part of which was conducted on the Crescent District, found that burial of pumice grape-fern plants was detrimental at all sites. Recovery from slight soil scraping or compaction is possible; however, such recovery was dependent upon soil quality. Although the vegetative parts of the grape-fern do not emerge consistently on an annual basis, the root system remains in place. Any deep burial, strong compaction, or disturbance to this root system from vehicle impacts could damage or cause mortality. To avoid disturbance, Project Design Features would include fencing the population and continued monitoring on a yearly basis. Also, a visual inspection of plant leaves to determine effects of fugitive dust. Moving the trail or adding a layer of gravel to the road surface close to the pumice grape-fern would be utilized if dust is observed to be coating the plant.

Wetland Species – The three of the four Sensitive plant species documented in the project area occur in wetland[65] sites on the District. These wetland sites are adjacent Forest Service roads (620, 580, and 080). All of these roads are currently designated as open, and would remain open with all five alternatives. The existing roads do not have an effect on these Sensitive plant sites. The exception to this is the 620 road, which was crosses several springs and the western edge of a fen. A Project Design Feature for fencing along the road adjacent to the wetlands has been incorporated to provide an additional layer of protection to these Sensitive plant species.

As the Three Trails OHV project does not propose any new trails or roads through wetland areas and being as off-road travel is not allowed in wetlands, none of the action alternatives would affect Sensitive plants.

[65] Wetlands are defined as areas of land where the soil is saturated with moisture permanently or seasonally. This includes swamps, marshes, bogs, and fens (EPA 2010).

Based upon observations during 2009 field surveys, none of the sites show evidence of unauthorized motorized use beyond railroad easement and road maintenance activities. Currently, rider use of the 620, 580, and 080 roads is relatively low, with the 620 and 580 roads primarily used as snowmobile routes during the winter. (Note: Although the 620 road is gated in the summer months and is closed to OHV's, riders drive around the gates to access the road). The 5800620 road would be part of the designated trail system and the gate would be removed for year-round travel.

It is predicted that a 2.5 to 5.6 percent yearly increase in rider use of the Three Trails OHV area within the Crescent District would occur upon completion of the well designed trail system. Associated with this is an increase in the potential for illegal off-route use. Often such use is found within wetland areas, as riders are attracted to 'mud bogging', which can severely impact a wetland. The key to preventing such harmful OHV use is a combination of rider education and enforcement (Crimmins 2006). The Three Trails OHV project has incorporated an active management program that would have regular enforcement presence and trail monitoring (refer to Monitoring and Enforcement section of this Chapter).

**Alternative A (No Action) -** Currently this road is designated as open, and receives low use from OHVs. Although current vehicle use is light, observations made in during 2008 and 2009 field surveys found evidence of tire tracks within the pumice grape-fern sites. Because these sites are not currently protected by a vehicle closure order, such off-road travel by vehicles is legal until the Travel Management Rule is implemented. Under Alternative A, such travel would remain legal, and pose a potential threat to the pumice grape-fern plants.

**Common to All Alternatives** - All the alternatives would keep the Bonneville Power Administration (BPA) powerline road (012) open to motorized travel as a Maintenance Level 2 road. None of the alternatives propose trail construction across the BPA 012 road, so there would be no effect from any of the proposed new trails. Because the pumice grape-fern plants are located adjacent, and not within, the road prism, any potential negative effects would come from motorized travel off of the roadway. Fencing to protect the pumice grape-fern is a Project Design Feature that has been incorporated.

**Alternatives B through E –** The Bonneville Power Administration (BPA) powerline road (012) would remain open to motorized use as a Maintenance Level 2 road. While current motorized use of the BPA 012 road is low, with a designated trail system a 2.5 to 5.6 percent yearly increase is expected above current levels. However, enforcement and trail monitoring would also increase under the active management program that would be implemented with the Three Trails OHV project. One way to protect this sensitive population is to utilize a structure like fencing, as such fencing has been used effectively to protect a pumice grape-fern site adjacent the Hog Rock Crawl area within the East-Fort Rock OHV area (Powers per. comm. 2009). A Project Design Feature to fence the site has been incorporate for Alternatives B through E.

**Cumulative Effects**

Other potential impacts to the pumice grape-fern population within the Three Trails OHV project area comes from powerline maintenance by BPA, which consists of the manual cutting of lodgepole saplings and shrubs. This manual treatment is ongoing and most likely has a beneficial effect by maintaining the open habitat that is preferred by this species. Therefore there are no aggregate effects associated with this action.

Rim-Paunina is a proposed project that would involve understory thinning, fuels reduction, and prescribed fire in the area below Walker Rim. Currently, there is only one unit that is adjacent a known pumice grape-fern location. The project would be designed to avoid populations; therefore there are no associated aggregate effects.

## Plant Species of Concern

American matsutake mushroom (*Tricholoma magnivelare*) and
Sugarstick (*Allotropa virgata*)

### Ecology

The American matsutake mushroom is the fruiting body (sporocarp) of the ectomycorrhizal fungus (*Tricholoma magnivelare*). The fungal mycelia are persistent below ground while the mushrooms only appear for a limited duration during the fall, after cold nights and early morning fog triggers the emergence of mushrooms (Kerr per. comm. 2008). The edible mushrooms do not necessarily reappear every year at all sites; however, the underground mycelial body remains present even if mushroom caps are not seen.

American matsutake grows throughout the Pacific Northwest, from southeast Alaska through the coastal pine forests and the eastern crest of the Cascade Range in Washington and Oregon, to the Siskiyou and Klamath mountains of southwest Oregon and northwest California (Pilz et al. 1996). Matsutake is associated with a number of tree hosts, including lodgepole pine, ponderosa pine, Douglas-fir, mountain hemlock, and true firs. In the southern Oregon Cascades highly productive matsutake sites occur in mixed conifer and pine habitat between 4430 and 6560 feet elevation (Hosford et al. 1997).
On the Crescent District, matsutake occurs primarily in the lodgepole, bitterbrush, needlegrass plant association that is common in the southwestern region of the District.

There are numerous factors (both natural and anthropogenic) that can affect the production and fruiting of matsutake. Such factors include weather, disturbance events, forest management practices, and mushroom harvesting practices. The timing of first frosts, autumn moisture and seasonal snowfall all affect mushroom production (Pilz et al. 1999). Because the mycelial body of the mushroom consists of fine fibers that are within the first few inches of the soil surface, any soil disturbances can also affect matsutake production. This includes improper harvest methods such as: raking to uncover the mushroom caps, which disturbs the mycelia mat and the mycorrhizal connections with host roots (Luoma et al. 2006). Disturbance and compaction associated with road building and skid trails may also disrupt mycorrhizal connectivity (Amaranthus et al. 2001). Forest management practices such as logging may enhance or reduce mushroom production, while some ground disturbance related to treatments affects not only mushroom production but can also disturb mycelial mats and reduce mycorrhizal connectivity (Kropp and Albee 1996; Pilz et al. 1999; Luoma et al. 2006).

Natural and management ignited prescribed fire both influences ectomycorrhizal community dynamics and succession in coniferous forests to varying degrees depending on intensity, time of fire, and length of time since fire (Visser 1995; Dahlberg et al. 2001; Smith et al. 2004). Fires of low intensity that leave the organic soil horizons relatively undamaged do not appear to substantially alter ectomycorrhizal community composition, whereas fires of high intensity that remove the organic layer and detrimentally burn the mineral soil significantly affect ectomycorrhizal community composition (Visser 1995; Baar et al. 1999; Grogan et al. 2000; Dahlberg et al. 2001).

#### Existing Condition

The commercial harvest of American matsutake is a highly valuable industry in the Pacific Northwest, with thousands of tons of mushrooms harvested annually (Molina 1993). Some of the most productive matsutake habitat is located on the Deschutes (Crescent Ranger District), Fremont-Winema (Chemult District), and the Umpqua (Diamond District) Forests (Hosford et al. 1997). On the Crescent Ranger

District an average of 287 commercial permits are purchased each harvesting season, at an annual value of $41,400. (This is based on Crescent permit sales from 1989 to 2007). Data on the amount of matsutake mushrooms harvested from the Crescent District is not collected, due to commercial proprietary information, so there is a lack of information of the cumulative volume (i.e. total weight) of mushrooms that are harvested annually.

The location of matsutake mushrooms is often inferred by the presence of sugarstick (*Allotropa virgata*), a perennial plant that is easily recognized by its striking red and white striped stem. Because sugarstick forms mycorrhizal (ie.fungal) associations with matsutake to obtain nutrients, these two species are considered to have a specific association (Leferve et al. 1998). Sugarstick has an above-ground stalk that is visible when matsutake fungal mycelia and mushroom caps are not; hence, sugarstick is a suitable indicator for the potential of mushroom habitat.

To quantify potential mushroom habitat within the Crescent Ranger District, surveys for sugarstick were conducted in 2003 with individual plant locations recorded on GPS equipment. This survey documented 1049 sites of sugarstick, with the densest concentrations in areas east of Highway 58, along the border of the Junction and Rivers subunits within the Three Trails OHV Analysis areas. Other sugarstick locations were documented in areas north of the community of Mowich. A recent, highly detailed analysis for the BLT project area which partially overlaps the Three Trails OHV project area, estimated the amount of potential matsutake area at 54,000 acres (Baker 2008).

The designated trail system was designed to avoid major production areas of matsutake mushroom harvesters. Public meetings were held in the evenings at mushroom camp for the mushroom harvesters. Mushroom harvesters indicated areas of high matsutake mushroom potential (based on historical knowledge). This input was utilized to avoid placing trails in the most productive and preferred mushroom harvesting sites. Also, the trail system was designed to avoid the immediate proximity of the mushroom camp to maintain the social setting and picking areas that are within walking distance of the camp.

**Measures**

The following measures would be used to compare the alternatives for effects of motorized travel and recreation on the impact to matsutake (*Tricholoma magnivelare*):

- Habitat acres open to motorized travel off of designated routes
- Known locations of sugarstick (*Allotropa virgata),* which is an indicator species for matsutake (*Tricholoma magnivelare*)

**Methodology**

To analyze the effects of alternatives to matsutake mushrooms, GIS data on known locations of sugarstick (*Allotropa virgata)* were overlaid onto the proposed road and trail system for each alternative. To calculate the acreage of potential effect to matsutake, a 25 $ft^2$ buffer[66] was applied to each sugarstick site.

**Assumptions**

- Sugarstick plants are an indicator for the presence of matsutake mushrooms
- The known locations of sugarstick offer a very limited 'snapshot' of potential matsutake sites within the Rivers planning area; actual sites of matsutake are far more numerous than is represented by the sugarstick data. There is no other quantitative data on sugarstick or matsutake locations within the Crescent District.

[66] Professional estimate of individual population size based on matsutake literature.

**Direct and Indirect Effects**
When looking at potential effects from motorized vehicle use on matsutake, anything that disrupts the organism or its soil habitat would be detrimental. Matsutake can have direct impacts from motorized vehicles, such as the crushing of mushroom caps and destruction of the underground mycelium. Motorized traffic use can also lead to a potential loss of matsutake habitat, as soil properties (water infiltration, compaction) become altered.

**Alternative A (No Action) -** Under this alternative, the existing road network system and user-created trails would remain in place, with the potential for future, user-created trails through matsutake habitat. Because Alternative A would allow future disturbance from OHVs, this alternative has the greatest potential to negatively affect matsutake areas through soil and vegetation disturbance.

**Common to all Action Alternatives –** Once theTravel Management Rule is likely implemented in 2011, all motorized travel would be restricted to designated routes. A monitoring and enforcement program would be implemented for the trail system, to ensure that riders abide by the trail regulations (see Monitoring and Enforcement section).

Action alternative effect to matsutake habitat is limited to the 60-84 miles of new trail construction. It is assumed all other designated routes and staging areas do not provide suitable habitat. In consideration of effects associated with BLT and other overlapping activities have the potential to effect matsutake production; there is ample habitat available within and adjacent to the project area.

Windigo Pass is near Crescent Lake and is characterized as one of the more valuable areas for picking matsutake mushrooms. The Three Trails OHV project area does not include the picking area surrounding Crescent Lake/Windigo Pass, which is outside the analysis area.

In all action alternatives approximately 56-95 miles of user-created trails, parking areas along the Little Deschutes River, and areas of cross-country travel would recover dependent upon active and passive restoration measures.

- All rehabilitation work areas would be revegetated with native species following disturbance.
- Erosion filtering fencing would be placed to control offsite movement of soils in rehabilitation areas adjacent to perennial streams.

**Alternative B, D, and E**
The action alternatives considered areas that had consistent mushroom production and high densities of known sugarstick sites[67] when designing the designated trail system. Alternatives B, D, and E do not propose any new trails through known matsutake habitat. During the GIS analysis and 2009 field surveys, none of the proposed trails directly impacted any known sugarstick sites.

**Alternative C**
Although Alternative C was designed around the most extensive, interconnected trail system of the action alternative, it also has the greatest amount of trail system with the potential to overlap matsutake habitat. However, during the GIS analysis and the 2009 filed surveys, none of the proposed trails in Alternative C were found to directly impact any of the known sugarstick (*Allotropa)* sites. A Project Design Feature was incorporated that has the botanist working with the implementation team to identify any new sites prior to trail construction.

[67] Based on 2003 Sugarstick surveys and mushroom harvesters historical knowledge.

## Cumulative Effects

Within the last decade, Forest management activities on the Crescent Ranger District has focused on thinning small diameter trees, reducing fuel loading, and using prescribed fire. The consideration of past and present overlapping activities: Baja (1998-2003), 5 Buttes (2007), Seven Buttes and Seven Buttes Return (1996, 2007), and BLT (2008), were factored into this analysis. To be conservative in estimating effects, it is assumed these projects removed habitat immediately upon implementation. Recovery time varies, matsutake production recovery might occur as soon as two years or as many as six years following treatment depending on Plant Association Groups (PAGs) and the original quality of the habitat. Where litter was removed and then replaced production seem to rebound after four to six years (Luoma et al. 2006). Areas of marginal but still productive habitat may take 10 years or more to recover. Due to the relatively small scale of habitat removed from this project, recovery time for previously harvested units and abundance of habitat in areas outside the harvest areas, the effects to matsutake production is not measurable. For other project units that have matsutake within them, all logging activities would be conducted during the winter and over snow, to minimize any ground disturbances that could affect the matsutake.

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# Invasive Plants

**Introduction**
Non-native invasive plants are aggressive species capable of degrading environmental quality or causing economic harm. Invasive plants are undesirable in forest ecosystems because they tend to displace native plants, degrade habitat for wildlife species, contribute to soil erosion, and potentially reduce the value of recreational experiences. They have developed many characteristics, such as rapid growth rates, high seed production, and extended growing periods that give them advantages over native plants.

**Management Direction**
National Direction
The Noxious Weed Management Act (1974) contains provisions to prevent the dissemination of noxious weeds. Other provisions in the act authorize the cooperation of Federal agencies with agencies of State, districts, farmers' associations and similar organizations or individuals in carrying out operations or measures to eradicate, suppress, control or retard the spread of any noxious weed. In addition, 36 CFR 222.8 acknowledges the Agencies' obligations to work cooperatively in identifying noxious weed problems and developing control programs in areas where National Forest System lands are located.

U.S. Forest Service Manual 2080 directs the Forest Service to use an integrated weed management approach to control and contain the spread of noxious weeds on National Forest lands (USFS 1995a).

Executive Order 13112 implemented on February 3, 1999 requires Federal agencies to use relevant programs and authorities to prevent the introduction of invasive species and not authorize or carry out actions that are likely to cause the introduction or spread of invasive species unless the agency has determined, and made public, documentation that shows that the benefits of such actions clearly outweigh the potential harm, and all feasible and prudent measures to minimize risk of harm would need to be taken in conjunction with the actions. The USDA Forest Service *Guide to Noxious Weed Prevention Practices* (July 2001) supports implementation of Executive Order 13112 on Invasive Species.

Regional Direction
Region 6 of the Forest Service has prepared an Invasive Plant Environmental Impact Statement (R6 IP EIS). The Final EIS was released in June 2005 and the Record of Decision (ROD) was signed in October 2005; implementation began March 1, 2006. The R6 IP EIS applies to non-native invasive plant species. Standards and Guidelines in the R6 IP EIS are incorporated into Forest Plans in the region.

Forest Direction
The Deschutes National Forest Land and Resource Management Plan is amended to incorporate Standards and Guidelines from the R6 IP EIS.

In 1998, the Deschutes National Forest Noxious Weed Control Environmental Assessment (DNF Weed EA) with its supplemental Deschutes National Forest Integrated Weed Management Plan (IWMP) was completed in accordance with the Regional Vegetation Management FEIS and Mediated Agreement. The Decision Notice from the DNF Weed EA selected an alternative that allows a variety of noxious weed treatments, including herbicides (USDA Forest Service, Deschutes National Forest 1998). The DNF Weed EA and IWMP identify and promote actions within the noxious weed management strategies of prevention, early treatment, maintenance, and awareness. Implementation of management strategies include analyzing the risk of noxious weed invasion during the project planning process and developing tactics to avoid introduction or spread of noxious weeds, clean equipment provisions in contracts, actions

to prevent weed introduction and spread, and suggestions for increasing awareness of noxious weeds and the risks they pose, both within the Forest Service and with the public.

Since the early 1990s, gathering information of location and size of infestations for all known noxious weed sites has been underway. This information has been entered into the Natural Resource Inventory System (NRIS) database for the Forest Service and GIS Invasives layer for the Deschutes Forest. Under the authority of the DNF Weed EA, noxious weeds have been treated within the areas of the Three Trails OHV project area starting in 1999 using manual control (e.g. hand-pulling).

The Deschutes and Ochoco National Forests have prepared an Invasive Plant Treatments FEIS which was released in December 2007. The Record of Decision has not yet been signed, as this document is currently undergoing revision. The purpose of the Invasive Plant Treatments FEIS is to reduce the extent of specific invasive plant infestations at identified sites, and to protect areas not yet infested from future introduction and spread of invasive plant species.

**Existing Condition**

A pre-field review was conducted using GIS Invasives layer (updated 1/28/2009) and the NRIS Invasives database for the Deschutes National Forest. There are 18 occurrences (records or sites) documenting the presence of 11 species of invasive plants that have been found within the Three Trails OHV project area (Table 105). These occurrences are primarily located along the major highways of the project areas: Highways 97, 58, 61 (Crescent Cut-off road), and 46 (Cascade Scenic Highway). These sites are mainly isolated infestations consisting of one to several dozen plants of the following weed species: diffuse knapweed, spotted knapweed, mullein, bull thistle, Canada thistle, St. John's wort, Dalmatian toadflax, oxeye daisy, white top, and Scotch broom. Although all of these species are listed on the weed list for the Deschutes Forest, not all have the same treatment priority. For example, mullein and bull thistle are common weeds found in recently disturbed areas (i.e., logging landings, road edges, etc.) on the Forest. Because these are ephemeral weeds that eventually get replaced by native vegetation, mullein and bull thistle are a low priority for treatment. Other species, such as the knapweeds and toadflaxes, are a high treatment priority because of their ability to rapidly spread into forest plant communities.

The highways and primary Forest Service roads are the main vectors for weed dispersal within the Crescent District, and are continual source of new weed infestations. Known weed sites within the Three Trails OHV analysis area have been treated manually (through hand-pulling) as part of the District's Invasive Plant Program. Through this program, all the major highways and roads, as well as recreational sites, have been monitored and treated annually for weeds since 1999. Although all plants are removed each year, weed material is dispersed from passing vehicles, which causes new infestations that need to be treated.

In addition to the highway corridors, the other main weed occurrence in the Three Trails OHV analysis area is a leafy spurge (*Euphorbia esula*) site located on the 5825 road near the community of Mowich. This is the only documented occurrence of this noxious weed in northern Klamath County, and is a species that is extremely difficult to eradicate. Leafy spurge is able to reproduce vegetatively from its roots, so manual removal is not an effective means of treatment. Although ineffective, hand-pulling is the only treatment available for this site, as it has not been approved for herbicide use through any NEPA documents. While manual treatment would not eradicate the spurge at this site, it would control the population and prevent it from spreading.

**Table 105. Known Occurrences of Invasive Plant Species within the Three Trails OHV Planning Area**

| Site Number | Species | Location |
|---|---|---|
| **Walker** | | |
| 6120042 | bull thistle | 100 Road (off of 9760) |
| 6120041 | spotted knapweed, diffuse knapweed, bull thistle, mullein, St. Johns wort, Canada thistle | Hwy 97 |
| **Junction** | | |
| 6120004 | spotted knapweed, diffuse knapweed, bull thistle, mullein, St. John's wort, Canada thistle | Hwy 62 |
| 6120006 | spotted knapweed, diffuse knapweed, bull thistle, mullein, St. John's wort, Canada thistle | Hwy 41 |
| 6120025 | diffuse knapweed, St. Johns wort | Crescent Lake Road |
| 6120030 | diffuse knapweed, bull thistle | Hwy 41 |
| 6120031 | spotted knapweed, diffuse knapweed, mullein, Dalmatian toadflax | Road 46, north of Dell Spring |
| 6120051 | bull thistle | Junction of Hwy 58 and 61 |
| 6120061 | Common toadflax, oxeye daisy, St. Johns wort, diffuse knapweed | Junction of Hwy 58 and 61 |
| 6120062 | Whitetop | Hwy 61 |
| 6120064 | mullein, St. Johns wort, bull thistle, Canada thistle, Scotch broom | Along railroad near Crescent Lake |
| **Rivers** | | |
| 6120054 | butter and eggs | Road 017 |
| 6120065 | bull thistle | Road 5825 |
| 6120066 | bull thistle | Road 780 |
| 6120099 | Kochia | Hwy 58 |
| 6120101 | leafy spurge | Road 5835 |
| 6120014 | S. John's wort | Junction of Hwy 58 and 97 |
| 6120034 | diffuse knapweed, bull thistle, Dalmatian toadflax, common toadflax, St. John's wort, | Hwy 58 |
| 6120035 | mullein, Dalmatian toadflax, St. John's wort | Hwy 58 (south of Muffin Manor) |

**Measures**

The following measures would be used to compare the alternatives for effects of motorized travel and recreation on invasive plant spread and establishment:

- Trail mileage for each alternative
- Acres of invasive plants in areas open to motorized travel (roads and trails)

**Methodology**

To analyze the effects of alternatives on the spread of invasive plant species, the Forest Service's National Resource Information System (NRIS) Invasive Plant database was used in conjunction with Geographic Information System (GIS) data. Known invasive plant sites were overlaid onto the proposed road and trail system for each alternative.

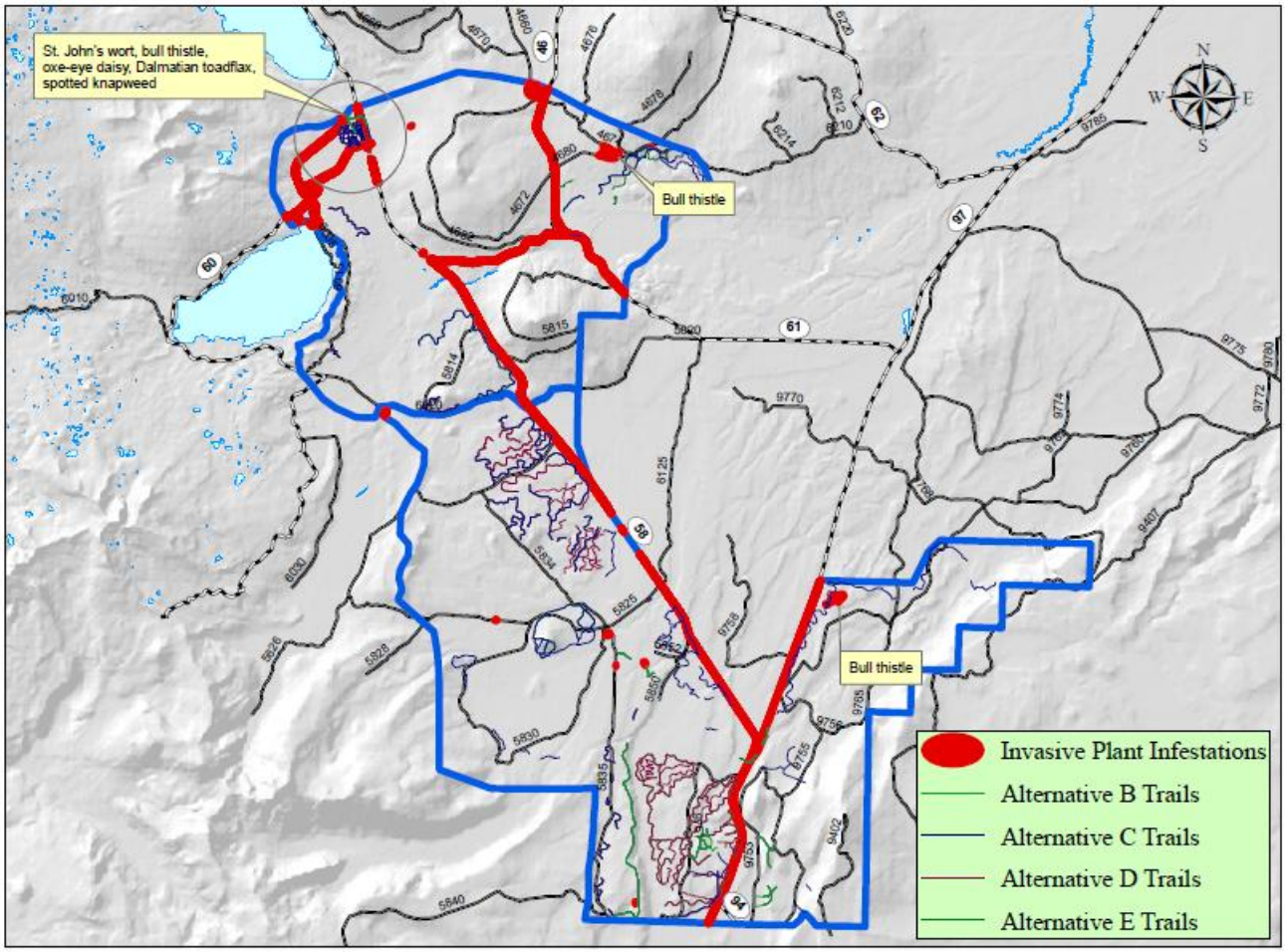


**Figure 34. Invasive Species Locations by Alternative in the Three Trails OHV Analysis Area**

Figure 34 shows the invasive plant locations. All the infestations are along major roads and Highways. The following Project Design Features were incorporated to help prevent the spread of these invasives.

- Actions conducted or authorized by written permit (contracts) require cleaning of all heavy equipment (i.e., bulldozers, skidders, and other construction equipment) prior to entering National Forest lands.
- All Forest Service employees would inspect remove, and properly, dispose of weed seed and plant parts found on their clothing and personal equipment prior to leaving a project site infested with weeds.
- Inspect gravel, fill, sand stockpiles, quarry sites and borrow materials for invasive plants before such material is transported and used within National Forest lands. Only gravel, fill, sand, and rock that are certified to be weed-free would be used within the project area.
- Only certified weed-free straw would be used when mulching material is required for trail and road rehabilitation projects.
- Native seed and plant materials would be used for all restoration and rehabilitation projects.
- Any OHVs used for trail construction would be free of mud, dirt, and plant parts prior to entering the project area.

**Assumptions**

- Vehicular routes are a vector for the spread and establishment of invasive plants. Invasive plant inventories, as well as professional observations, also indicate that the vast majority of invasive plant sites on the Crescent District are along motorized routes. The more miles/acres that are open to motorized use, the greater the potential for invasive plant spread.
- A 2.5 to 5.6 percent increase in riders would occur on a yearly basis.
- Limiting motorized access to designated routes would reduce the amount of disturbed habitat and therefore reduce the spread of invasive plants into interior areas.
- In analyzing the effects of the designated roads on known weed sites, it was found that an average of either 1.5 or 1.6 infested acres was found for each alternative. This similarity is a result of the main invasive plant sites being located along the major highways and roads within the District. Among all alternatives, all of these major highways and Forest Service roads would remain open to motorized use, so each one would have the same impact on these known weed sites.
- Rehabilitation activities such as soil decompaction, pose the same level of risk as trail building activities, and they are equal among the action alternatives.
- Effects for action alternatives are being based upon an effective monitoring program, weed free trail building practices, and rider education at staging areas.

**Direct and Indirect Effects**

Numerous studies have examined the effect of vehicle routes on the establishment and spread of non-native invasive plants (Clifford 1959; Schmidt 1989; Forman and Alexander 1998; Hansen and Clevenger 2005; Zwaenepoel et al. 2006). Vehicle routes, both paved and unpaved, have been considered to act as vectors for invasive plant seed dispersal and establishment (Gelband and Belnap 2003; Von der Lippe and Kowarick 2007). The disturbed and compacted soils associated with roads increases the potential for non-native plants to successfully invade and establish in these areas (Adams 1982; Greenberg et al. 1997; Lovich and Bainbridge 1999). Road margins, both for paved and unpaved routes are routinely cleared for maintenance, creating disturbance corridors where the vegetation is continually altered and the soil is exposed. Such disturbed margins acts as areas for prolific seed production for non-native plants (Sparrow et al. 1978; Parendes and Jones 2000; Christen and Matleck 2006; Kalwij et al. 2008), and increase the likelihood that invasive plants would move into adjacent plant community areas (Wester and Juvick 1983; Lonsdale and Lane 1994; Ouren et al. 2007).

**Risk Assessment**

Considering that a) the majority of inventoried invasive plant sites occur along roads, and b) vehicular routes act as vectors for the transport of invasive plants; all Action Alternatives, including the No Action Alternative, pose a moderate to high risk for the introduction and spread of weeds**.**

**Alternative A (No Action)** – The No Action alternative currently has few restrictions for motorized travel off of existing routes. With Alternative A, the current road system, as well as all user-created trails, would continue to be open for OHV use until the Travel Management Rule is implemented. This results in a total of 962 miles of roads and trails available for OHV use (844 miles of road, 118 miles of known, user-created trails). This alternative would have the greatest risk until the Travel Management Rule is implemented, then the risk would be the same as action alternatives.

Compared with the other alternatives, Alternative A is the most difficult to effectively monitor and treat weed infestation sites. Because vehicles would be allowed to travel off designated routes, there would be an ever increasing number of user-created trails and roads that would need to be surveyed and treated for weeds. Cross-country travel would have the potential for weeds to be introduced into secluded areas where they could grow and spread unnoticed for years. Considering the finite resources (i.e. personnel

and money) allocated to the District for the weed program, it is not feasible under Alternative A to effectively monitor and treat weed infestations within a network of expanding user-created trails.

**Alternative B and E –** These alternatives offer 143 and 140 trail miles, respectively, within the designated route system. This is the least amount of trail miles available for vehicle use of any of the proposed alternatives. Because of this lower mileage; Alternatives B and E pose a more moderate risk for weeds. In terms of weed monitoring and treatment, Alternatives B and E would provide a more manageable system for invasive species monitoring of the designated roads and trails.

**Alternative C and D –** These alternatives would result in 153 and 151 trail miles, respectively. Because these alternatives would provide the most extensive trail network with associated staging areas, they may alter the present level of OHV use the area receives. Currently, the existing trails and roads are used primarily by local riders that live within the rural subdivisions and riders coming from the Crescent/Gilchrist area and the community of LaPine. Occasional use, particularly during hunting season, is seen from riders outside the immediate area. As the Crescent District has a relatively small issue with weed infestations compared to other Districts within the Forest, local riders pose only a minor risk of introducing or spreading weed material. However, that risk would increase as riders from more weed-infested areas came to the Crescent District to ride the designated trail system.

The route system proposed by Alternatives C and D would have a more extensive trail system and therefore greater opportunity for weeds to become established before being noticed and eradicated. These alternatives would pose a moderate risk for weed introduction and spread.

**Cumulative Effects**

Table 11 was reviewed for foreseeable actions that are ground disturbing and have the potential to contribute to an incremental effect combined with the Three Trails OHV project. All past and present activities have been accounted for in the existing weed population discussion. Foreseeable actions include the Rim-Paunina project. The origin of most invasive plants in the analysis area can be found along most major highways, and the Crescent Ranger District has successfully managed a prevention program through monitoring and rapid response through handpulling. There is no indication the Three Trails OHV project and additive effects from past, present, and foreseeable actions would change this success.

## Rare and Uncommon

Considered are those species from the bryophyte, lichen, fungi, and vascular plant groups identified in the Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (January 2001), that are known or suspected to occur within the Three Trails OHV planning area. All action alternatives were designed to comply with this document.

The Standards and Guidelines provide benefits to rare species of fungi, lichens, bryophytes, vascular plants, and other species. Three basic criteria must be met: 1) the species must occur within the Northwest Forest Plan (NWFP) area, or occur close and have potentially suitable habitat within the NWFP area; 2) the species must be closely associated with old-growth or late-successional forest; and 3) the reserve system and other Standards and Guidelines do not appear to provide for reasonable assurance of species persistence.
Species included are placed in the following categories:
Category A - Rare, Pre-Disturbance Surveys Practical

- Manage all known sites
- Conduct pre-disturbance surveys
- Conduct strategic surveys

Category B - Rare, Pre-Disturbance Surveys NOT Practical

- Manage all known sites
- Conduct strategic surveys
- Conduct equivalent-effort surveys

Category C - Uncommon, Pre-Disturbance Surveys Practical

- Manage high-priority sites
- Conduct pre-disturbance surveys

Category D - Uncommon, Pre-Disturbance Surveys NOT Practical or Deemed Not Necessary

- Manage high-priority sites
- Conduct strategic surveys

Category E – Rare, Status Undetermined

- Manage all known sites
- Conduct Strategic Surveys

Category F – Uncommon, Status Undetermined

- Conduct strategic surveys

**Prefield Review for Rare and Uncommon Plants**

A prefield review was conducted in February 2010 using the species listed in the 2001 ROD. The purpose of the review was to determine 1) which species would need pre-disturbance field surveys, and 2) which species were known within the Three Trails OHV planning area, and would need either protection or mitigation. Plant species that require pre-disturbance surveys (Category A and C) on the Deschutes National Forest are shown in Table 106. It should be noted that this is a list of those species whose known range is within the Deschutes Forest, and is a subset of all the plant species listed in the 2001 ROD. (The 2001 ROD has an extensive list of rare species that are found throughout the Pacific

Northwest, with most of the listed species restricted to the very moist, dense old-growth forests that are found in western Oregon and Washington.)

Rare and Uncommon plant species with known sites on the Crescent District are also summarized in Table 106. These sites were discovered over the last 10 years through both pre-disturbance and strategic surveys. Most of these sites are documented in the Natural Resource Inventory System (NRIS), which is the Forest Service's national database for resource information.

**Table 106. Rare and Uncommon Plant Species for the Crescent Ranger District (2001 ROD)**

(Highlighted species are those with known sites within the Three Trails OHV project area.)

| **Taxa Requiring Consideration for Pre-disturbance Surveys (Categories A and C)** | | | | |
|---|---|---|---|---|
| **Species** | **Category** | **Group** | **Within Project Planning Area?** | **Location/Comments** |
| *Cypripedum montanum* | C | Vascular | No | Very showy perennial, not observed on the Crescent |
| *Schistostega pennata* | A | Bryophyte | No | Known sites around Odell Lake |
| *Leptogium cyanescens* | A | Lichen | No | Habitat is riparian and on vine maple and bigleaf maple in upland settings |
| **Taxa Requiring Management of Known Sites (Categories B, D, and E)** | | | | |
| *Albatrellus caeruleoporus* | B | Fungus | No | Trapper Creek |
| ***Bryoria tortuosa*** | **D** | **Lichen** | **Yes** | **Royce Butte** |
| ***Buxbaumia viridis*** | **D** | **Moss** | **Yes** | **Royce Butte,** Upper Princess Creek |
| *Calicium glaucellum* | F | Pin lichen | No | East side Crescent Lake |
| *Chaenotheca furfuracea* | F | Pin lichen | No | Maklak area |
| *Chaenotheca subroscida* | E | Pin lichen | No | Maklak area |
| *Chalciporus piperatus* | D | Fungus | No | Trapper Creek campground |
| *Clavariadelphus ligula* | B | Fungus | No | North side of Odell Lake |
| *Clavavaridelphus truncatus* | B | Fungus | No | North side of Odell Lake |
| *Gastroboletus subalpinus* | B | Fungus | No | Trapper Creek trailhead |
| *Mycena overholtsii* | B | Fungus | No | West end Odell Lake (Manage high-priority sites) |
| ***Nivatogastrium nubigenum*** | **B** | **Fungus** | **Yes** | **Odell Butte** |
| *Ramaria amyloidea* | B | Fungus | No | Trapper Creek trailhead |
| ***Ramaria rubrievanescens*** | **B** | **Fungus** | **Yes** | **Odell Butte** |
| *Ramaria rubripermanens* | B | Fungus | No | North of Odell Lake in Roadless Area |
| *Rhizopogon atroviolaceus* | B | Fungus | No | East side Crescent Lake |
| ***Rhizopogon truncatus*** | **D** | **Fungus** | **Yes** | **North side Crescent Lake,** Hamner Butte |

*Category D species require management of high-priority sites only.

From the prefield review, the following seven Rare and Uncommon plant species have known sites: *Bryoria tortusa, Buxbaumia viridis, Cantharelles subalpinus, Gomphus bonari, Nivatogastrium nubigen, Ramaria rubrievanescens,* and *Rhizopgon truncatus.* Only two of these species, *Buxbaumia viridis* and *Bryoria tortusa,* have documented sites that are near any existing roads or proposed trails for the Three Trails OHV project. The remainder of the sites are located away from any existing roads or trails, and would not be directly or indirectly affected by the Three Trails OHV project.

The following discussion offers a summary of the current knowledge on the ecology and existing condition of those plant species within the Three Trails OHV planning area.

***Bryoria tortusa*** (tortured horsehair lichen)
**Ecology:** *B. tortuosa* is a hanging, filamentous lichen, often bright yellow from heavy concentrations of vulpinic acid. Within North America, this lichen species ranges from British Columbia northern California (USFS 2000). In Oregon, it is most common east of the Cascade crest in stands of Douglas fir and ponderosa pine, where it is considered locally abundant. Outside of the North America, *B. tortuosa* is only known from the Carpathian Mountains of Europe and sites in Norway (NatureServe 2009). Within the Pacific Northwest, *B. tortuosa* prefers the drier habitats associated with well-lit, open forest stands. It frequently grows on oaks and pines, although it has been collected on a variety of trees and shrubs (Lesher et al. 2000). In southern Oregon, *B. tortuosa* is frequently found with large stands of dead manzanita (*Arctostaphylos* spp.). *B. tortuosa* appears to be well adapted to forests with frequent, natural low-intensity fires.

Horsehair lichen commonly grows intermixed with the more common *B. fremontii*, a forage lichen that is a principal winter food source (Maser et al. 1985) and important nesting material (Hayward and Rosentreter 1994) for the northern flying squirrel.

**Existing Condition**
Currently *B. tortuosa* is considered stable throughout its range (NatureServe 2009). However, threats to this species are those actions that disrupt stand conditions necessary for its survival, including treatments that disturb populations by tree canopy, and altering light, moisture, or temperature regimes (Lesher et al. 2000). Air-pollution sensitivity may be another threat to this species, as other *Bryoria* species are sensitive to pollutants (McCune and Geiser 1997).

In the eastern Cascades of Oregon and Washington the principle threat to *B.tortuosa* is clear-cutting (Lesher et al. 2000). Because *B. tortuosa* occupies transitional areas at the edge of the mountains, its habitat is subject to repeated human disturbance and encroachment by development. Its habitat at numerous historical locations has been destroyed (McCune & Geiser 1977). Thinning and low-intensity fires are not likely to threaten established populations of this species, especially if host trees are not removed (Lesher et al. 2000).

Within the Crescent District, there are eight known sites of *B. tortuosa*, three of which are within the Three Trails OHV planning area: one on Odell Butte and two by Black Rock. Under the 2001 ROD, this lichen species is considered a Category D, which indicates that high-priority sites need to be managed. Because of the relatively few occurrences of this lichen, all the known sites on the Crescent District are considered high-priority, and managed as such.

The following are the recommended management principles for *B. tortuosa* in the eastern Cascades (Lesher et al. 2000).

1. Manage *B. tortuosa* within fifth-field watersheds to maintain representative populations.
2. Thinning and low-intensity prescribed fire or natural fire is not likely to be detrimental to the long-term survival of populations in eastern Oregon and Washington.

3. Maintain occupied substrate, and provide for distribution of appropriate substrate and associated microclimatic conditions and forest structure in areas of known populations.
4. Special consideration would be given to maintain populations near the edge of the geographical range of *B. tortuosa*, and in watersheds where it is rare and of limited distribution.
5. If stands at known sites are treated, the older cohort would be maintained as a source of inoculum. Larger, older trees would be selected for retention, particularly those that are colonized by *B. tortuosa*.

***Buxbaumia viridis*** (green bug moss)
**Ecology:** *Buxbaumia viridis* is a unique moss of old-growth forests. It has a distinctive sporophyte (reproductive) capsule that is long and slender, which has given this species its common name of green bug moss. Because the gametophyte stage (i.e. leafy portion) is virtually nonexistent, the only way to identify this species in the field is by its sporophyte (Christy and Wagner 1996). This tiny moss ranges from northern California to British Columbia, with additional sites in Montana. This species is also known in Europe, Scandinavia, and Russia. On a worldwide basis, there are 300 documented sites of this species totaling approximately 5,000 individuals (NatureServe 2009).

*B. viridis* occurs on very well rotted logs and stumps (decay class three, four, and five) and on mineral or organic soil in cool, shaded, humid locations at middle elevations (Christy and Wagner 1996). Most commonly, this species has been found in floodplains and stream terraces, due to the large amount of decayed wood available in old growth. However, *B. viridis* can be found on almost any landform, including the shaded cutbanks of trail and roads. On the eastern slopes of the Cascades *B. viridis* occurs on logs that are extremely decayed and appear to have "melted" into the soil (Christy and Wagner 1996).

In terms of habitat threats, *Buxbaumia viridis* is sensitive to changes in light level and microclimate caused by removal or thinning of the forest canopy. This species is also highly dependent upon adequate amounts of coarse woody debris in the appropriate decay classes. In a forest landscape intensively managed on 40-year rotations, *B. viridis* may disappear if suitable substrate or microclimate is not available for growth, or if sources of propagules (from old growth areas) no longer exist (Christy and Wagner 1996).

Although *B. viridis* is widespread in Europe and Scandinavia, it is reported to be in decline in these areas, with most countries listing it as rare, threatened, or endangered in most countries (NatureServe 2009). In North America, populations of *B. viridis* are considered stable (NatureServe 2009). However, many of the known sites in the Pacific Northwest occur near trails, and therefore may be subject to recreational impacts such as changes in the microclimate or mortality from direct contact.

On the Crescent District there are seven sites of *B. viridis*, three of which occur within the Three Trails OHV planning area (NRIS 2009). These latter sites are located near existing and open roads on the south and southeast side of Royce Butte.

***Cantharelles subalpinus*** (white chanterelle)
**Ecology:** *C. subalpinus*, more commonly known as the white chanterelle, is an edible mushroom that is prized for its mild taste and order (Pliscke 2009). This fungi species is widely distributed throughout the Pacific Northwest from British Columbia to California. It grows as scattered to clumped mushroom caps in duff under mixed hardwood and conifer forests. It most commonly forms mycorrhizal associations with pines (*Pinus* sp.), Douglas fir (*Pseudotsuga menziesii*), and madrone (*Arbutus menziesii*). The mushrooms themselves are seen during the fruiting season, from late fall to mid-winter.

Throughout the region of the Northwest Forest Plan, there are 250-300 documented occurrences of *C. subalbidus*. Considering that this species is an edible fungus that is sought by mushroom hunters, there

are probably numerous additional sites that are undocumented. Within the Crescent Ranger District there is one known site of white chanterelle, which was found on Odell Butte during Strategic and Purposive surveys for rare fungi species.

***Nivatogastrium nubigenum*** (bubblegum fungus)
**Ecology:** *N. nubigenum* is a very unique fungus that is endemic to Oregon and California. It is a part of the 'snowbank' guild of fungi; those fungi in western North America that emerge after snowmelt in subalpine and alpine montane forests.

*N. nubigenum* is characterized by its strong, sweet-smelling odor that has been described as a 'bubblegum' scent, which has given this species its common name. It is also distinctive with a mushroom cap whose margins remain attached to the stipe (e.g. mushroom stalk) at maturity. This species fruits on the surface of rotten fir (*Abies* sp.) logs at high elevations above 1,300 m. This species generally fruits in the spring and throughout the summer (May through early October) shortly after snow-melt.

Originally documented in the Sierra Nevada range, *N. nubigenum* in the Pacific Northwest is known from only 13 sites in California (Siskiyou County) and Oregon (Deschutes, Klamath, and Lane counties). Four of these known sites are within the Deschutes National Forest: two on Bend Ft. Rock District, one on the Sisters District, and one on Crescent District on Odell Butte (Castellano et al. 1999).

***Ramaria rubrievanescens***
**Ecology:** The genus *Ramaria* is distinctive among the fungi with its branching, coral-like fruiting body. *R. rubrievanescens* is distinguished from other *Ramaria* species by its evanescent pink color, which is present only in the primordial branch tips. This species, like many other fungi, forms mycorrhizal associations with pines, and is found in mineral soil or humus. The fruiting season for this species is June, September, and October.

Within the area of the Northwest Forest Plan, this species is known from only 10 documented sites. However, this species has also been found outside of the western US, including eastern North America. Within the Deschutes National Forest, there are four documented sites: two on the Bend Ft. Rock and one on the Sisters Ranger Districts. There is also one known site on the Crescent District, on Odell Butte.

***Rhizopogon truncatus***
**Ecology:** The genus *Rhizopogon* consists of numerous truffle fungi that are widespread throughout the Pacific Northwest, and form mycorrhizal associations with pines. *R. truncatus* is a truffle that is highly distinctive from all other *Rhizopogon* species by its bright yellow coloration and spores that are strikingly truncate in shape (Castellano et al. 2003)

Within the Pacific Northwest, *R. truncatus* is found mostly in Oregon, with sites concentrated in the southwest, coastal counties of the state. There are also scattered occurrences of *R. truncatus* in northern California. On the Deschutes National Forest, there are two documented sites: one on the Bend Fort Rock and the other on Hamner Butte on the Crescent District.

**Fungi - Environmental Consequences**
Rare and Uncommon fungi consist of both epigeous (above-ground mushrooms) and hypogenous (underground fruiting bodies, such as truffles) fungi species. These fungi are important to ecosystem processes because of their ability to form symbiotic (beneficial) associations with the roots of other plants, especially conifers. The fungi help their host trees to absorb nutrients from the soil, while the host plants provide the fungi with carbohydrates. The mycelium, or body, of the fungi resides within the duff and upper soil horizons in forested systems. Although fungi only fruit during certain times throughout the year, the mycelium is always present within the soil.

Because of the close association between fungi and their host trees, alterations to forest stands can have dramatic impacts on fungi species richness and density. Due to the prevalence of logging within the Pacific Northwest, there have been numerous studies that have documented the effects logging on fungi. Such studies have shown that clear-cutting dramatically alters fungi species composition (Bryd et al. 2000; Durall at al. 2006) and reduces fungal abundance (Bath 1980; Durall et al. 1999; and Hagerman et al. 1999). Other studies have shown that variable density and green tree retention logging, which tend to have less impacts that clear-cutting, also can result in shifts to soil fungi. In variably thinned Douglas-fir forests, Colgan et al. (1999) found truffle abundance was less in all thinned stands compared with controls, and that there was a significant shift in fungal species composition within the thinned stands. Luoma et al. (2005) found that within green-tree retention stands, mushroom production and fungal species richness was significantly reduced in all treatment levels except the controls. These effects to soil fungi from logging have been attributed to a number of factors related to the reduction of the forest canopy, including loss of host tree species (Amaranthus and Perry 1994), reduced soil moisture (Kranabetter and Wylie 1998) and increased soil temperature.

There are other environmental factors that can affect soil fungi. Wildfires have been shown to decrease fungi abundance, at least within the immediate years following a fire (Bruns et al. 2002). High intensity fires that remove a high proportion of soil organic matter can result in a high mortality of fungal species (Dahlberg 2002). Parasitic infestations have also been shown to affect soil fungi. Cullings et al. (2005) found that dwarf mistletoe infection on lodgepole pine resulted in a shift species composition of soil fungi with a decrease in species richness.

Although there have been no studies on the effects of OHV use on soil fungi, there have been studies that examined the effects of logging skid trails on fungi species composition and abundance. Such studies have shown that activities that result in soil compaction can reduce soil fungi by degrading soil structure and reducing water and oxygen movement through the soil (Amaranthus et al. 1996; Williamson et al. 2000). Activities that reduce or remove the organic duff layer can also reduce fungi abundance by disrupting nutrient flow and removing fungi mycelium (Wiensczyk et al. 2002).

Because of the numerous factors that can affect soil fungi, both researchers and land managers have stressed the importance of conserving fungal diversity in the Pacific Northwest (Amaranthus 1988).

There are four segments of trail segments that fall within the Northwest Forest Plan area. These sites have been visited and based upon the definition in the 2001 ROD, they are not classified as old growth.

**Direct and Indirect Effects**

**Alternative A (No Action) -** Currently there are no existing roads or known user-created trails that are directly affecting documented Rare and Uncommon plant sites within the Crescent District. However, under the No Action alternative, cross-country motorized travel would continue. Such undesignated trail creation would have the potential to affect some of the known Rare and Uncommon plant sites. This is the case for those known sites *Buxbaumia viridis* that are adjacent to existing roads on Royce Butte, and would be susceptible to damage from motorized off-road travel. Once the Travel Management Rule is implemented, there would be no motorized cross-country travel.

**Alternatives B and D -** None of the proposed routes (roads and trails) in Alternatives B and D would traverse through or near any of the known Rare and Uncommon plant sites. Although there are several plant sites on Odell Butte, there are no trails proposed in this area. Therefore, these alternatives would have no effect on the Rare and Uncommon plant species.

**Alternatives C and E** – Both Alternatives C and E propose construction of a new OHV trail on the north side of the Black Rock lava formation. This trail would traverse through a known *Bryoria tortuosa*

habitat, and would bisect the largest known occurrence of this species on the Crescent Ranger District. Mitigation measures to have the botanist work with trail surveyors to flag known sites for avoidance during trail layout and a Project Design Feature to install fencing would protect this known site. These measures have been used numerous times on the forest and they have ben highly effective.

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## Cultural Resources

The following has been summarized from the State Historic Preservation Office (SHPO) Report. Due to the sensitive nature of the information, this report is on file at the Forest headquarters, the Crescent District office, and at the State Historic Preservation Office.

**Management Direction**

Management direction for cultural resources is found in the Deschutes National Forest Resource Management Plan, in the Forest Service Manual section 2360, in Federal Regulations 36CR64 and 36CFR800 (amended December 2000), and in various federal laws including the National Historic Preservation Act (NHPA) of 1966 (as amended), the National Environmental Policy Act, and the National Forest Management Act.

In general, the existing management direction asks the Forest to consider the effects on cultural resources when considering projects that fall within the Forest's jurisdiction. Further direction indicates that the Forest would determine what cultural resources are present on the forest, evaluate each resource for eligibility to the National Register of Historic Places (National Register), and protect or mitigate effects to resources that are eligible.

Relevant Forest Plan Standards and Guides include:
CR-2, which states that cultural resource properties located during inventory, will be evaluated for eligibility to the National Register.

CR-3, which states that in concert with inventories and evaluations, the Forest will develop thematic National Register nominations and management plans for various classes of cultural resources.

CR-4 indicates that project level inventories or the intent to conduct such shall be documented through environmental analysis for the project.

**Desired Condition**

The desired condition is not clearly stated in the Forest Plan but can be derived from the implied goals of the Standards and Guides and the Monitoring Plan. It would be desired to know the location and extent of all cultural resources, to have evaluated each one for eligibility to the National Register, and to have developed management plans for all eligible properties that would provide protection or mitigate effects that would occur to the resources.

Unmanaged recreation activities such as those occurring on known sites in the project area have likely affected historic properties and individual site integrity. This project has an opportunity to direct some of the motorized use to areas more appropriate and sustainable in consideration of cultural resources.

**Existing Condition**

It is assumed there has been loss of site integrity from actions that occurred before the implementation of regulations for the National Historic Preservation Act (NHPA). This means that the active protection of cultural resources has a relatively short history, approximately 40 years. Historic use of places beginning in the historic period of discovery, settlement, and subsequent development of forest roads, trails, and other facilities that overlap known and unknown sites has likely caused loss of site integrity.

In addition to pre-field investigations utilizing Geographical Information System layers and existing records, site specific surveys have been conducted on 82 percent of the project area, which includes all of

the high probability areas. This also includes areas accessible and visible from the proposed trails with a medium to high potential for the presence of cultural resources. No new cultural resource sites were identified during newly reported surveys.

Over one hundred cultural resource sites are present. The majority of them have been evaluated for eligibility to the National Register of Historic Places (NRHP). Of those evaluated, approximately half are from the historic era (at least 50 years old). The remaining are prehistoric in age (inferred from the presence of stone tool technologies), or contain evidence of occupation during both time periods.

Sites from the historic period include wagon roads, refuse dumps, refuse scatters, historic structure remains, a utility corridor, remains of historic era railroad logging, historic townsites, and pumice mines. Prehistoric site types represented include lithic scatters, lithic scatters with flaked stone tools, lithic scatters with fire altered rocks, culturally modified trees, possible rock shelters, and vision quest sites.

Review of spatial and tabular data for the sites indicate approximately two-thirds of them are not located near any of the proposed routes of the designated trail system. Most of the remaining sites are crossed by or are situated adjacent to existing Maintenance Level 2 roads (for high clearance vehicles) that would become part of the designated trail system.

Of the sites crossed by or immediately adjacent to existing Maintenance Level 2 roads, most have been evaluated for National Register eligibility. Approximately one-third were found to be eligible and the remaining are not eligible. Six of these sites have not been evaluated for National Register eligibility.

There are four sites that are crossed by shared use roads, crossed by roads to be opened for use, crossed by Maintenance Level 1 roads to be converted to trail, crossed by new trail segments, have recreation facilities planned within the site boundaries, or are adjacent to shared use roads or new trail segments. These sites are the subject of a site specific Data Recovery/Treatment/Monitoring Plan included with the SHPO compliance report.

## Direct and Indirect Effects

### Alternative A

In general, this alternative would continue the existing situation of uncontrolled creation and use of user-created trails through the forest until the Travel Management Rule is implemented. Where new routes are developed through cultural resource sites, there is displacement, crushing, breakage, and general loss of site context and integrity. Where OHV use persists on existing roads that traverse eligible or unevaluated cultural resource sites, integrity would continue to degrade as unrestricted travel allows vehicles to forge into new sites. Lack of maintenance on user-created trails can compound on eligible or unevaluated sites by development of deep ruts causing erosion plus breakage, churning, displacement, and loss of artifacts and site integrity.

### Action Alternatives

Following guidelines in a 2003 Regional Programmatic Agreement (PA) among USDA-Forest Service, the Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Office (SHPO), a finding of "*No Adverse Effect*" (No Historic Properties Affected) was determined under Stipulation III(B)5 of the Programmatic Agreement. The Forest finds that there are historic properties but the undertaking would have no adverse effect on them as defined by 36 CFR 800.16(i). Any potential information that would otherwise be lost would be documented and reported to the SHPO. This finding is based on Project Design Features and mitigation measures that have been incorporated to determine the eligibility of unevaluated sites prior to trail construction. This would be accomplished through a series of treatment, data collection, and trail rehabilitation measures to document potential character defining features of the site. For those sites that may be eligible and are already being traversed from user-created

trails through or adjacent to the site, Mitigation Measures would include site protection of the remaining portion adjacent to the route, data recovery, and/or avoidance. Protection is not required for those sites that are evaluated and found not eligible.

A mitigation/site protection table is incorporated in the cultural resource compliance report. Because of its sensitive nature, it is not included in this analysis. Coordination between project implementation personnel and the District archaeologist would occur during layout of the trails in the sensitive areas to best adjust designated routes and identify site boundaries where avoidance is required.

Trail construction may involve widening of the trail to the appropriate width for the class of vehicle to be used for the trail system. In most cases, this would be 50 inches for OHVs, which also accommodates motorcycles. Also, routine ground disturbing activities would occur such as blading of trails for leveling and maintenance, as well as creating appropriate drainage features as described in Chapter 2, Project Design Features and the Soil Quality section in this Chapter.

There are circumstances where historic motorized access for dispersed recreation activities has occurred in sites that are eligible for listing in the National Register, or unevaluated (may or may not be eligible). It is unknown if these activities in the area have altered character defining site features and how much site integrity has been compromised. Where a user-created trail is proposed for the designated trail system and it overlaps an eligible or unevaluated site, rutting and periodic maintenance activities have the potential to bury, crush, displace and/or lose context for artifacts that may be within the footprint of the trail. Prior to trail construction and designation, all unevaluated sites would be evaluated. If the site is found to be eligible, the next step would be to determine whether the portion that overlaps the trail would contribute to that eligibility. If it does, then the following may take place: 1) trail relocation; 2) data recovery efforts sufficient to recover available information and the trail system would continue to be used; and/or 3) site protection through tread armoring and/or barriers to off-trail travel.

Trail grooming equipment includes a narrow tracked machine with a blade mounted in the back. Such equipment might eventually expose otherwise unknown cultural material on an unidentified site by removing obscuring deposits. Due to the nature of the tephra-rich sediments on the Crescent Ranger District, artifacts are known to migrate up and down in the strata. Agents of movement are artificial, as noted above, as well as natural, such as wind and flood events, erosion, tree roots, tree tip ups, burrowing insects, rodents, birds, and especially freeze-thaw cycles. Given the dynamic nature of these sediments, artifacts abandoned on the 7000 year old Mazama surface are not always visible or in their original context at abandonment. For more description of trail grooming and maintenance activities, reference Chapter 2 “Common to All Activities” and Chapter 3 “Soil Quality”.

In those instances when the road traverses a known cultural resource site, loss of potential site information has been assumed to have already occurred within the depth of the road material and would not increase as a result of changing the use of the road. In some cases, the road would have shared use between regular (passenger cars, pickups, etc.) and trail vehicles. In others, the road would be closed to all but trail system users. Neither of these instances would directly affect a known site that is already traversed by the road.

Another potential loss of site integrity would occur if an existing road is being converted to a narrower width for a trail segment. The method of ripping the road bed with heavy equipment, especially on a native surface, would directly affect a cultural resource site that may be traversed by the road. Although loss of integrity may have occurred during road formation and continued use, deposits below the surface of the road bed could disturb a buried archaeological site, its artifacts, and their context within the site. Project Design Features in this circumstance would maintain the integrity of the site by using trail

narrowing methods such as surface impediments in lieu of subsurface disturbance of deposits, whether from trail creation activities or deep rutting.

Portions of abandoned railroad grades are also part of the trail system. There would be no effect to them, because they have been evaluated for National Register eligibility and found not to be eligible. No protection is required for sites that are not eligible.

All rehabilitation ground disturbing activities would occur where there would be no effect to eligible historic properties. Other rehabilitation activities would use appropriate non-ground disturbing methods such as above ground barriers and shallow rooting of vegetation.

There is a potential from the sound generated by OHVs to be heard where American Indians potentially hold ceremonies. Because of identification of features that indicate these sites and ongoing consultation with the Klamath Tribe, some of them are known. For these, project design has avoided placement of a trail system in direct proximity[68] within 0.89 miles. However, there may be other unknown sites that would typically remain unidentified because of their sacred nature. The purpose of the sites is of religious importance and is meant to occur in the absence of artificial/outside intrusions. Excessive sound from OHV engines, or other activities unrelated to OHV use could be considered such an intrusion.

**Cumulative Effects**

Cumulative effects on cultural resources were determined by focusing on the current aggregate effects of past, present, and reasonably foreseeable future actions. For cultural resources, in general, past actions have avoided effects to eligible or unevaluated cultural resource sites, because of the Forest Service responsibility to protect their values. This has largely been accomplished through avoiding the pertinent cultural resource sites for those activities that are closely monitored. For example, an overlapping vegetation management (BLT) determination of effect to cultural resources found: "Following guidelines in a 2003 Regional Programmatic Agreement among USDA-Forest Service, the Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Office, a finding of "Historic Properties Avoided" was determined. This finding is based on the practice of avoiding all eligible and unevaluated sites." Therefore, in this circumstance, there would be no cumulative effects.

In the past, the strategies of site protection or mitigation have been reasonably successful because of efforts to inventory, identify, evaluate, and manage cultural resources. Therefore, any overlapping past, present, or reasonably foreseeable action on this project would not intensify the effects expressed as direct and indirect.

**Monitoring**

Monitoring of all known sites in proximity to the trail system would occur during and after trail construction and route designation for a period of 10 years. They would be incorporated into a set schedule of visits by staff who manage the trail system and dedicated to education, monitoring, and law enforcement. During routine patrols, these personnel would determine whether off-trail riding is occurring. Any off-trail riding that occurs would trigger a focused response to remedy the situation such as identifying the offending riders for potential enforcement action and using methods on the trail system to discourage further incursions. These personnel would immediately report the incident to staff archeologists for any further rehabilitation and corrective actions. No ground disturbing activities associated with corrective actions or rehabilitation off the trail system would occur without agency archeologist oversight. A standard Deschutes National Forest monitoring form that is used for other designated trail systems would be used along with photographs where needed.

[68] Research and on-the-ground sound testing in the project area indicated that sound dampens at this distance from the source to a level that cannot be heard by most people.

# Transportation System

**Existing Condition**

The following section has been incorporated from the transportation specialist report in its entirety. Within the Three Trails Off-Highway Vehicle (OHV) analysis area there are 1,337 miles of road under various private and public jurisdictions that include federal, state, county, and private entities. The existing road system is, in general, evenly distributed throughout the analysis area, with a somewhat greater density of roads being found in the southern and eastern portions of the analysis area in the vicinity of the Two Rivers North subdivision and between U.S. Highway 97 and Walker Rim.

The majority of roads in the analysis area are located on relatively gentle terrain, with ground slopes rarely exceeding 15 percent. A few roads can be found in midslope positions on slopes up to or even beyond 30 percent; these roads are primarily located on Odell and Royce Mountain and along the western face of Walker Rim.

Within the analysis area, there is one Cooperative Road Management Area established by agreement between the Oregon Department of Fish and Wildlife and USDA-Forest Service and adjacent industrial forest land owners. The Walker Rim Green Dot system establishes a network of open and closed roads during the fall deer rifle-hunting season in the southeastern portion of the analysis area east of U.S. Highway 97.

**Age and Development History of the Transportation System**

The majority of roads within the analysis area have been in existence for better than 40 years, with few additions having been constructed in the recent past. Some portions of the system dating back to early railroad logging in the early 20$^{th}$ Century are centered around the historic sawmill facility at Mowich, which was sited just north of the Two Rivers North subdivision. In fact, some roads that are currently part of the inventoried transportation system served in earlier days as locations for railroad grades.

With limited exceptions (and excluding State and County highways), roads in the Three Trails OHV analysis area have been constructed for access to timber harvest areas. A certain few roads were constructed specifically in support of railroad and utility corridor rights-of-way and a small number of roads on private land have been developed as infrastructure in support of developing subdivisions such as Two Rivers North, Diamond Peak Estates, Cresdell Acres, and others.

**Road Use Patterns over Time, Now, and in The Future**

The majority of roads within the analysis area, and in particular those roads under Forest Service jurisdiction, have a general pattern of use common to low-standard forest roads in the absence of residential enclaves or developed recreation. With the exception of roads in the vicinity of subdivisions such as Two Rivers North – where off-highway vehicle (OHV) use, and in particular Class 1 All-Terrain Vehicle (ATV) use, is extensive – or of the arterial roads and major collector through routes such as Forest Roads 60, 6020, 5825, 5830, and 5835, most roads see little use other than administrative traffic through the course of the spring and summer. Timber sale activity can contribute substantially to daily traffic numbers, but the pattern of such activity is usually isolated in one particular area at any given time.

In past years when active grazing allotments were located within the analysis area, there was a small usage component provided by permittee vehicles, but that has ended with the abandonment of the allotments. The bulk of use for the majority of roads comes in the late summer and fall with the commencement of deer and elk hunting seasons and the matsutake mushroom picking season.

The existing road system is employed by a number of specific users in support of their endeavors. Union Pacific Railroad holds road use permits to maintain access to their main rail line running through the analysis area and Mid-State Electric Cooperative uses parts of the existing system to service their electrical lines passing through the analysis area. In addition, certain roads provide access to Burlington Northern Railroad and Klamath Northern Railroad lines and to a natural gas transmission pipeline that is located in the south-eastern portion of the analysis area. These uses, although not a considerable component of the total usage, have occurred for many years (especially in the case of access for the three rail lines) and would continue into the foreseeable future.

The anticipated future use patterns would be somewhat reflective of current trends of primarily administrative and timber sale-related use during the summer and increased traffic by hunters and mushroom pickers in the fall. It would also be anticipated, however, that the selection and implementation of an action alternative in this analysis would result in an increase in recreational traffic during the summer months as a result of increased OHV use.

**Primary Destinations of Road System Users**

The bulk of the roads within the analysis area do not generally serve any particular destinations, but instead provide access to areas of interest for various users. For land managers and contractors, these roads serve as access to areas where vegetative management or other land management activities are ongoing or planned. For matsutake mushroom pickers, they provide entry into a number of prolific picking areas in the southwest portion of Crescent Ranger District. These roads also provide access to popular hunting areas such as Royce Mountain, the Big Marsh Creek drainage, and the Walker Rim area.

**Existing Maintenance Levels and Road Surface Types**

Maintenance Levels define the degree of maintenance required for a specific road and the level of service which that road provides, consistent with road management objectives and maintenance criteria (FSH 7709.58, Transportation System Maintenance Handbook). The five maintenance levels are defined as:

> **Maintenance Level 1**: Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed one 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 physically 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" passenger cars. "Discourage" or

"prohibit" strategies may be employed for certain classes of vehicles or users; unless otherwise specifically authorized, non-street-legal OHV use is prohibited.

**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" passenger cars. However, the "prohibit" strategy may apply to specific classes of vehicles or users at certain times; unless otherwise specifically authorized, non-street-legal OHV use is prohibited.

**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", except that, unless otherwise specifically authorized, non-street-legal OHV use is prohibited.

The majority of roads within the Three Trails OHV analysis area, approximately 84 percent, are native-surface roads. Those under Forest Service jurisdiction are variously managed as either being open for high-clearance vehicle traffic (Maintenance Level 2) or as being physically closed so that traffic is eliminated and the roads are in a basic custodial status (Maintenance Level 1) but not prohibited (by Forest Order). The native-surface roads in Maintenance Level 2 status are not maintained on a recurring basis but are instead periodically reviewed to determine whether there are maintenance needs necessary to protect adjacent resource values. Some of the native-surface roads in the analysis area are on private land and are variably open to public access, depending on the wishes of those individual landowners or the existence of public rights of way (as in the case of subdivisions with the analysis area).

An additional 11 percent of the roads are either categorized as improved native or aggregate-surfaced. A few of these roads, especially portions of Road 60 along with Road 6020 and the segment of Road 5830 serving the Two Rivers North subdivision, are maintained to allow passenger car use (Maintenance Level 3), while most of the others aren’t specifically maintained for passenger car use but are generally readily usable by such vehicles under most circumstances.

The remaining five percent of roads are asphalt or bituminous-surfaced facilities, including State Route 58, US Highway 97, County Road 61 and Road 46 (Cascade Lakes Highway), and portions of Road 60 and 5825. Most of these routes are under the jurisdiction of entities other that USDA-Forest Service, but all of the asphalt-surfaced routes are maintained to standards that are represented by Maintenance Levels 4 and 5. Under these maintenance levels, passenger car use is encouraged and the primary emphasis is on traveler comfort, convenience, and safety.

**Table 107. Miles of Road by Maintenance Level**

| Operational Maintenance Level | Miles |
|---|---|
| Unclassified Other Jurisdiction | 304 |
| M/L 1 (Closed) | 343 |
| M/L 2 (High Clearance Vehicles Allowed) | 608 |
| M/L 3 (Passenger Car Allowed; Low Speed) | 24 |
| M/L 4 (Passenger Car Accepted; Moderate Speed) | 8 |
| M/L 5 (Passenger Car Encouraged; High Speed) | 47 |

Within the analysis area, operation of non-highway legal vehicles is prohibited on those roads classified as Maintenance Level 3, 4, or 5; operation of such vehicles is allowed on those roads not maintained for passenger car use (M/L 1 and 2) in accordance with Oregon Revised Statue 821.055.

**Existing Road Management Objectives**

The existing management objectives for roads within the analysis area generally call for roads to be managed primarily for land management and administrative purposes; public access is generally allowed but is a secondary consideration except in areas where subdivisions are located or where there is a specific recreation emphasis. The majority of roads that are managed for land management/administrative purposes do see a great deal of public usage during hunting season and the open season for matsutake mushroom picking. Arterial and collector routes (two- and four- digit roads) are generally managed to facilitate a mix of commercial, administrative, and public use, although a few of the collector (four-digit) routes, such as Road 5834, are of sufficiently low standard that they can be designated as single-user routes during timber sale activity.

With the exception of those roads providing access to recreational facilities or recreational/permanent residences, the seven-digit local road component is managed, when open, to be primarily used by high-clearance vehicles, including OHVs. Passenger car operation is possible on many of these routes, but no special consideration is given to allowing such use. During timber sale activity, these roads are intended to be single-user facilities, given that their combination of narrow travel ways and a lack of frequent, intervisible turnouts preclude opportunities to safely provide for mixed commercial/public traffic.

**Route Densities**

**Roads**

The Three Trails OHV analysis area lies within portions of sixteen separate sixth-field subwatersheds. The total road density in all sixteen subwatersheds is 4.23 miles per square mile; total open road density is 3.22 miles per square mile. Total road density of roads under Deschutes National Forest jurisdiction in these subwatersheds is 2.62 miles per square mile and total Deschutes National Forest open road density is 1.66 miles per square mile.

The density of operational open roads within the sixteen subwatersheds is shown in Table 108 and the total road density is displayed in Table 109. Road densities are displayed as the total acres in the watershed divided by miles of roads for: 1) all roads and 2) Forest Service roads only.

**Table 108. Operational Open Road Density – Subwatershed Basis (Mile/Square Mile)**

| Subwatershed Name | Operational Open Road Density [69] | | | | |
|---|---|---|---|---|---|
| | Alt A | Alt B | Alt C | Alt D | Alt E |
| BUNNY BUTTE **(All Roads)** | 3.06 | 3.08 | 2.98 | 2.96 | 2.98 |
| BUNNY BUTTE **(FS Roads Only)** | 1.83 | 1.86 | 1.75 | 1.73 | 1.75 |
| CLOVER BUTTE **(All Roads)** | 1.44 | 1.47 | 1.10 | 1.10 | 1.10 |
| CLOVER BUTTE **(FS Roads Only)** | 1.02 | 1.06 | 0.68 | 0.68 | 0.68 |
| COLD CREEK **(All Roads)** | 2.10 | 2.07 | 2.05 | 2.05 | 2.05 |
| COLD CREEK **(FS Roads Only)** | 1.04 | 1.02 | 0.99 | 0.99 | 0.99 |
| CORRAL SPRINGS **(All Roads)** | 5.69 | 5.63 | 5.61 | 5.61 | 5.61 |
| CORRAL SPRINGS **(FS Roads Only)** | 0.62 | 0.55 | 0.42 | 0.40 | 0.42 |
| CRESCENT BUTTE **(All Roads)** | 6.13 | 5.72 | 4.34 | 4.53 | 4.34 |
| CRESCENT BUTTE **(FS Roads Only)** | 2.82 | 2.41 | 1.03 | 1.21 | 1.03 |
| GILCHRIST JUNCTION **(All Roads)** | 4.74 | 3.30 | 4.78 | 4.78 | 4.76 |
| GILCHRIST JUNCTION **(FS Roads Only)** | 2.38 | 0.93 | 2.41 | 2.41 | 2.40 |
| HEMLOCK CREEK **(All Roads)** | 1.99 | 1.69 | 1.80 | 1.59 | 1.80 |
| HEMLOCK CREEK **(FS Roads Only)** | 1.66 | 1.36 | 1.48 | 1.26 | 1.48 |
| LITTLE ODELL CREEK **(All Roads)** | 3.58 | 3.22 | 2.98 | 2.98 | 2.98 |
| LITTLE ODELL CREEK **(FS Roads Only)** | 2.96 | 2.59 | 2.36 | 2.36 | 2.36 |
| LITTLE WALKER MOUNTAIN **(All Roads)** | 3.58 | 3.61 | 2.91 | 2.95 | 2.95 |
| LITTLE WALKER MOUNTAIN **(FS Roads Only)** | 2.72 | 2.73 | 2.03 | 2.07 | 2.07 |
| LOWER BIG MARSH CREEK **(All Roads)** | 1.43 | 1.43 | 1.20 | 1.20 | 1.20 |
| LOWER BIG MARSH CREEK **(FS Roads Only)** | 1.20 | 1.20 | 0.97 | 0.97 | 0.97 |
| LOWER CRESCENT CREEK **(All Roads)** | 3.34 | 3.34 | 3.34 | 3.34 | 3.34 |
| LOWER CRESCENT CREEK **(FS Roads Only)** | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 |
| MIDDLE CRESCENT CREEK **(All Roads)** | 3.20 | 2.78 | 2.77 | 2.78 | 2.79 |

[69] Operational Road Density is the current intent, Objective Road Maintenance level is the desired condition

| Subwatershed Name | Operational Open Road Density [69] | | | | |
|---|---|---|---|---|---|
| | Alt A | Alt B | Alt C | Alt D | Alt E |
| MIDDLE CRESCENT CREEK **(FS Roads Only)** | 2.29 | 1.87 | 1.86 | 1.87 | 1.88 |
| NORTH PAUNINA **(All Roads)** | 2.99 | 3.57 | 3.70 | 3.54 | 3.86 |
| NORTH PAUNINA **(FS Roads Only)** | 1.90 | 1.64 | 1.69 | 1.61 | 1.75 |
| NORTH WALKER **(All Roads)** | 3.78 | 3.78 | 3.72 | 3.72 | 3.72 |
| NORTH WALKER **(FS Roads Only)** | 0.13 | 0.13 | 0.04 | 0.07 | 0.04 |
| ODELL CREEK **(All Roads)** | 2.06 | 2.14 | 3.55 | 2.14 | 2.14 |
| ODELL CREEK **(FS Roads Only)** | 1.74 | 1.83 | 1.83 | 1.83 | 1.83 |
| SOUTH PAUNINA **(All Roads)** | 4.08 | 4.08 | 5.00 | 3.51 | 3.55 |
| SOUTH PAUNINA **(FS Roads Only)** | 2.81 | 2.81 | 2.28 | 2.25 | 2.28 |

**Table 109. Total Road Density- Subwatershed Basis (Mile /Square Mile)**

| Subwatershed Name | Total Road Density [70] | | | | |
|---|---|---|---|---|---|
| | Alt A | Alt B | Alt C | Alt D | Alt E |
| BUNNY BUTTE **(All Roads)** | 3.65 | 3.65 | 3.48 | 3.40 | 3.48 |
| BUNNY BUTTE **(FS Roads Only)** | 2.43 | 2.43 | 2.26 | 2.17 | 2.26 |
| CLOVER BUTTE **(All Roads)** | 1.92 | 1.82 | 1.66 | 1.82 | 1.71 |
| CLOVER BUTTE **(FS Roads Only)** | 1.39 | 1.39 | 1.24 | 1.39 | 1.28 |
| COLD CREEK **(All Roads)** | 2.66 | 2.55 | 2.55 | 2.55 | 2.55 |
| COLD CREEK **(FS Roads Only)** | 1.60 | 1.50 | 1.49 | 1.49 | 1.49 |
| CORRAL SPRINGS **(All Roads)** | 5.91 | 5.91 | 5.90 | 5.78 | 5.90 |
| CORRAL SPRINGS **(FS Roads Only)** | 0.84 | 0.84 | 0.69 | 0.70 | 0.69 |
| CRESCENT BUTTE **(All Roads)** | 6.51 | 6.51 | 6.24 | 6.51 | 6.30 |
| CRESCENT BUTTE **(FS Roads Only)** | 3.20 | 3.20 | 2.93 | 3.19 | 2.99 |
| GILCHRIST JUNCTION **(All Roads)** | 5.09 | 5.09 | 5.00 | 5.00 | 5.00 |
| GILCHRIST JUNCTION **(FS Roads Only)** | 2.73 | 2.73 | 2.64 | 2.64 | 2.64 |

[70] This is the total existing road tally, regardless of whether closed or not.

| Subwatershed Name | Total Road Density [70] | | | | |
|---|---|---|---|---|---|
| | Alt A | Alt B | Alt C | Alt D | Alt E |
| HEMLOCK CREEK **(All Roads)** | 3.04 | 3.04 | 2.94 | 3.04 | 2.97 |
| HEMLOCK CREEK **(FS Roads Only)** | 2.71 | 2.71 | 2.61 | 2.71 | 2.65 |
| LITTLE ODELL CREEK **(All Roads)** | 5.12 | 5.12 | 4.84 | 4.69 | 4.84 |
| LITTLE ODELL CREEK **(FS Roads Only)** | 4.50 | 4.50 | 4.22 | 4.07 | 4.22 |
| LITTLE WALKER MOUNTAIN **(All Roads)** | 5.86 | 5.43 | 4.90 | 5.11 | 5.29 |
| LITTLE WALKER MOUNTAIN **(FS Roads Only)** | 5.00 | 4.55 | 4.02 | 4.24 | 4.41 |
| LOWER BIG MARSH CREEK **(All Roads)** | 2.45 | 2.45 | 2.32 | 2.38 | 2.32 |
| LOWER BIG MARSH CREEK **(FS Roads Only)** | 2.23 | 2.23 | 2.10 | 2.16 | 2.10 |
| LOWER CRESCENT CREEK **(All Roads)** | 3.81 | 3.81 | 3.81 | 3.81 | 3.81 |
| LOWER CRESCENT CREEK **(FS Roads Only)** | 1.80 | 1.80 | 1.80 | 1.87 | 1.80 |
| MIDDLE CRESCENT CREEK **(All Roads)** | 4.76 | 4.76 | 4.65 | 4.76 | 4.68 |
| MIDDLE CRESCENT CREEK **(FS Roads Only)** | 3.85 | 3.85 | 3.74 | 3.85 | 3.77 |
| NORTH PAUNINA **(All Roads)** | 5.42 | 5.40 | 5.15 | 5.34 | 5.37 |
| NORTH PAUNINA **(FS Roads Only)** | 3.50 | 3.48 | 3.23 | 3.41 | 3.44 |
| NORTH WALKER **(All Roads)** | 3.86 | 3.86 | 3.86 | 3.86 | 3.86 |
| NORTH WALKER **(FS Roads Only)** | 0.21 | 0.21 | 0.18 | 0.21 | 0.18 |
| ODELL CREEK **(All Roads)** | 4.59 | 4.59 | 4.59 | 4.59 | 4.59 |
| ODELL CREEK **(FS Roads Only)** | 4.27 | 4.27 | 4.27 | 4.27 | 4.27 |
| SOUTH PAUNINA **(All Roads)** | 5.04 | 5.04 | 5.00 | 4.96 | 5.04 |
| SOUTH PAUNINA **(FS Roads Only)** | 3.77 | 3.77 | 3.73 | 3.69 | 3.77 |

User-Created Trails and All Motorized Routes

Over time, a network of motorized trails has developed within the analysis area. The bulk of these trails can be found within a few miles north and south of the Two Rivers North subdivision and are largely the result of all-terrain vehicle (ATV) activity by year-round and recreational residents living in that and

other nearby subdivisions. These trails serve essentially as an extension of the official transportation system, providing shortcuts and connectors between existing roads as well as longer cross-country riding opportunities.

The density of user-created motorized trails within the sixteen subwatersheds is shown in Table 110 and the accumulated density of user-created trails and open roads (All Motorized Routes) is displayed in Table 111.

**Table 110. Motorized Trail Density – Subwatershed Basis (Mile/Square Mile)**

| Subwatershed Name | Total Trail Density | | | | |
|---|---|---|---|---|---|
| | Alt A | Alt B | Alt C | Alt D | Alt E |
| BUNNY BUTTE | 1.06 | 0.00 | 0.84 | 1.25 | 0.77 |
| CLOVER BUTTE | 0.23 | 0.14 | 0.06 | 0.00 | 0.00 |
| COLD CREEK | 0.18 | 1.08 | 0.55 | 0.54 | 0.54 |
| CORRAL SPRINGS | 0.53 | 0.06 | 0.17 | 0.42 | 0.38 |
| CRESCENT BUTTE | 0.00 | 0.00 | 0.43 | 0.00 | 0.00 |
| GILCHRIST JUNCTION | 1.38 | 0.74 | 0.49 | 0.13 | 0.19 |
| HEMLOCK CREEK | 0.53 | 0.94 | 0.33 | 0.00 | 0.50 |
| LITTLE ODELL CREEK | 0.06 | 0.00 | 1.01 | 1.95 | 0.73 |
| LITTLE WALKER MOUNTAIN | 0.63 | 1.34 | 1.39 | 1.65 | 1.51 |
| LOWER BIG MARSH CREEK | 0.00 | 0.00 | 0.12 | 0.05 | 0.12 |
| LOWER CRESCENT CREEK | 0.00 | 0.00 | 0.25 | 0.00 | 0.29 |
| MIDDLE CRESCENT CREEK | 0.00 | 0.00 | 0.25 | 0.00 | 0.13 |
| NORTH PAUNINA | 1.00 | 1.05 | 0.89 | 0.14 | 0.12 |
| NORTH WALKER | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ODELL CREEK | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| SOUTH PAUNINA | 1.23 | 1.33 | 0.60 | 1.70 | 1.38 |

**Table 111. All Motorized Routes Density – Subwatershed Basis (Mile/Square Mile)**

| Subwatershed Name | Motorized Open Route Density | | | | |
|---|---|---|---|---|---|
| | Alt A | Alt B | Alt C | Alt D | Alt E |
| BUNNY BUTTE **(All Roads)** | 4.12 | 3.08 | 3.82 | 4.21 | 3.75 |
| BUNNY BUTTE **(FS Roads Only)** | 2.89 | 1.86 | 2.59 | 2.98 | 2.52 |
| CLOVER BUTTE **(All Roads)** | 1.67 | 1.61 | 1.16 | 1.10 | 1.10 |
| CLOVER BUTTE **(FS Roads Only)** | 1.25 | 1.21 | 0.74 | 0.68 | 0.68 |
| COLD CREEK **(All Roads)** | 2.28 | 3.16 | 2.60 | 2.59 | 2.59 |
| COLD CREEK **(FS Roads Only)** | 1.22 | 2.10 | 1.55 | 1.54 | 1.54 |
| CORRAL SPRINGS **(All Roads)** | 6.22 | 5.69 | 5.77 | 6.02 | 5.98 |

| Subwatershed Name | Motorized Open Route Density | | | | |
|---|---|---|---|---|---|
| | Alt A | Alt B | Alt C | Alt D | Alt E |
| CORRAL SPRINGS **(FS Roads Only)** | 1.14 | 0.62 | 0.58 | 0.82 | 0.79 |
| CRESCENT BUTTE **(All Roads)** | 6.13 | 5.72 | 4.77 | 4.53 | 4.34 |
| CRESCENT BUTTE **(FS Roads Only)** | 2.82 | 2.41 | 1.46 | 1.21 | 1.03 |
| GILCHRIST JUNCTION **(All Roads)** | 6.12 | 4.04 | 5.27 | 4.91 | 4.95 |
| GILCHRIST JUNCTION **(FS Roads Only)** | 3.75 | 1.67 | 2.90 | 2.55 | 2.58 |
| HEMLOCK CREEK **(All Roads)** | 2.52 | 2.63 | 2.14 | 1.59 | 2.30 |
| HEMLOCK CREEK **(FS Roads Only)** | 2.19 | 2.30 | 1.81 | 1.26 | 1.97 |
| LITTLE ODELL CREEK **(All Roads)** | 3.64 | 3.22 | 3.99 | 4.93 | 3.71 |
| LITTLE ODELL CREEK **(FS Roads Only)** | 3.02 | 2.59 | 3.37 | 4.31 | 3.09 |
| LITTLE WALKER MOUNTAIN **(All Roads)** | 4.21 | 4.94 | 4.30 | 4.60 | 4.46 |
| LITTLE WALKER MOUNTAIN **(FS Roads Only)** | 3.35 | 4.07 | 3.42 | 3.72 | 3.58 |
| LOWER BIG MARSH CREEK **(All Roads)** | 1.43 | 1.43 | 1.32 | 1.25 | 1.32 |
| LOWER BIG MARSH CREEK **(FS Roads Only)** | 1.20 | 1.20 | 1.09 | 1.03 | 1.09 |
| LOWER CRESCENT CREEK **(All Roads)** | 3.34 | 3.34 | 3.59 | 3.34 | 3.63 |
| LOWER CRESCENT CREEK **(FS Roads Only)** | 1.33 | 1.33 | 1.58 | 1.33 | 1.62 |
| MIDDLE CRESCENT CREEK **(All Roads)** | 3.20 | 2.78 | 3.02 | 2.78 | 2.92 |
| MIDDLE CRESCENT CREEK **(FS Roads Only)** | 2.29 | 1.87 | 2.11 | 1.87 | 2.01 |
| NORTH PAUNINA **(All Roads)** | 4.00 | 6.10 | 4.58 | 3.68 | 3.98 |
| NORTH PAUNINA **(FS Roads Only)** | 2.90 | 4.17 | 2.58 | 1.75 | 1.87 |
| NORTH WALKER **(All Roads)** | 3.78 | 3.78 | 3.72 | 3.72 | 3.72 |
| NORTH WALKER **(FS Roads Only)** | 0.13 | 0.13 | 0.04 | 0.07 | 0.04 |
| ODELL CREEK **(All Roads)** | 2.09 | 2.17 | 2.17 | 2.17 | 2.17 |
| ODELL CREEK **(FS Roads Only)** | 1.78 | 1.86 | 1.86 | 1.86 | 1.86 |
| SOUTH PAUNINA **(All Roads)** | 5.31 | 5.42 | 4.15 | 5.21 | 4.93 |

| Subwatershed Name | Motorized Open Route Density | | | | |
|---|---|---|---|---|---|
| | Alt A | Alt B | Alt C | Alt D | Alt E |
| SOUTH PAUNINA **(FS Roads Only)** | 4.04 | 4.15 | 2.88 | 3.95 | 3.66 |

**Alternative A**

Alternative A would maintain the status quo within the project area until the Travel Management Rule is implemented. Although typical user-created trail systems do not remove trees and take advantage of existing areas of disturbance, herbaceous cover would continue to be removed as trail systems and parking areas expand. It is estimated the user-created trail system expands at least two to five miles on a yearly basis since the early 1990s, when OHV use became more prevalent in the Three Trails OHV Project area.

The mileage of open and closed roads, and the resultant road densities, would remain as they are. Maintenance Level 2 roads would be open for mixed use by both highway-legal and non-highway-legal vehicles, but there would be no roads incorporated as portions of any designated trail system. Non-highway-legal vehicles would be prohibited on all roads maintained for passenger car use (Maintenance Level 3, 4, and 5). Use of Maintenance Level 1 roads and user-created roads and trails would be subject to decisions resulting from implementation of the 2005 Travel Management Rule on the Deschutes National Forest expected in 2011.

**Effects Common to All Action Alternatives**

A minimum road system has been identified that would be needed for safe and efficient travel and for administration, utilization, and protection of National Forest Lands. The Interdiscplinary Team and Responsible Official assessed the project on a route-by-route basis. This document is the roads analysis for the Three Trails OHV project area. Through an interdisciplinary process and numerous public forums with interested and affected citizens, a minimum system was identified that meets applicable statutory and regulatory requirements; as well as reflecting long-term funding expectations. This system was analyzed at the appropriate scale and is reflected in the identified routes and road closures in each alternative that responds to the proposed action and its key issues. An appropriate discussion for each resource identifies the potential adverse and beneficial environmental effects associated with route designation, closure and decommissioning, and maintenance.

To varying degrees, each of the four Action Alternatives incorporates the use of National Forest System Roads to provide designated connectivity throughout the Analysis Area within and between portions of the designated trail system. Subsequent to the establishment of the 2005 Travel Management Rule, the Regional Forester of the Pacific Northwest Region issued direction that an Engineering Analysis would be required for any National Forest System Road designated for mixed use (allowing use by both highway-legal and non-highway-legal vehicles). As part of the proposed implementation of the Travel Management Rule on the Deschutes National Forest, mixed use analysis has been performed to establish the suitability of allowing mixed use on roads in the context of their current setting in terms of alignment, width, typical user speed, and presence or absence of traffic control devices. Supplemental analysis would be performed on certain designated mixed-use roads in the analysis area that have been determined to be unsuitable for a mixture of OHVs and highway-legal vehicles because of either their current setting or their designation as roads maintained for passenger car use (on which non-highway-legal vehicle use is prohibited). In particular, this supplemental Engineering Analysis was performed on portions of Roads 5825, 5830, and 6020 to determine what requirements would be necessary to allow for safe use by a mix of highway-legal and non-highway-legal vehicles. A Project Design Feature is included that posts all shared use routes within the Three Trails OHV Project area with confirmation signing for the presence of OHVs.

In order to establish connectivity for OHVs from the Walker area at the southern end of the analysis area to Crescent Lake Junction at its northern end, each alternative includes proposals for construction of a highway underpass beneath U. S. 97 just south of the U. S. 97/O.R. 58 interchange and a railroad crossing on the Union Pacific Railroad line east of the Two Rivers North subdivision. Subject to funding, implementation of these actions would entail applying for and securing a crossing permit from the Rail Division of the Oregon Department of Transportation (ODOT) and entering into an agreement with ODOT for construction of an underpass.

**Alternative B**

Under Alternative B, 41 miles of roads under jurisdiction of the Deschutes National Forest would be closed by changing their status to Maintenance Level 1, nine miles of Forest Service roads (both Maintenance Level 1 and 2) would be converted to trails, and three miles of roads currently identified as Maintenance Level 1 would be converted to Maintenance Level 2. As a result, total density and open-road density of all roads and Deschutes National Forest roads would be reduced at the analysis area scale (which for density evaluation includes the entirety of the 16 sixth-field subwatersheds).

At the subwatershed scale, the distribution of road/trail conversions and changes in Maintenance Level would result in a general reduction in total and open road densities.

Designation of OHV trails in the proposed Rivers, Junction, and Walker dense areas, along with closure of user-defined trails not incorporated into the designated trail system, would result in an increase in OHV trail density of approximately 0.01 mi/mi$^2$ at the analysis area scale over Alternative A (0.37 mi/mi$^2$ versus 0.36 mi/mi$^2$). While the majority of subwatersheds would have decreased OHV trail densities as a result of user-defined trail closures, this overall increase would primarily be due to increased density in the five subwatersheds where trail designation would be concentrated: Cold Creek, Hemlock Creek, Little Walker Mountain, North Paunina, and South Paunina.

The overall density of total open 'motorized' routes (comprised of open roads and designated OHV trails) would be slightly less that in Alternative A, but would be greater in six individual subwatersheds – Cold Creek, Hemlock Creek, Little Walker Mountain, North Paunina, Odell Creek, and South Paunina – because of the concentration of designated trails in the 'dense areas' that fall into those subwatersheds Table 111). At the Analysis Area Scale, the density of total open routes (open roads and designated OHV trails) would be 3.49 mi/mi$^2$ and the density of Forest Service open routes would be 1.88 mi/mi$^2$, which would be less than those Alternative A (3.58 mi/mi$^2$ and 2.02 mi/mi$^2$, respectively).

Implementation of Alternative B would result in 20 miles of open Forest Service roads being specifically designated as Shared Used route components of the trail system to provide connections within and between designated trail areas (as differentiated from other Maintenance Level 2 roads on which mixed use would be allowed but that are not part of the identified trail system). This mileage would include portions of Roads 5825, 5834, 5835, and 6020. This designation, coupled with redistribution of OHV use patterns, prohibition of overland travel and driving on Maintenance Level 1 roads, and reduction by 40 miles of Maintenance Level 2 roads within the Analysis area through closure and trail conversion, would result in an increase in both highway-legal and non-highway-legal traffic on both the designated Shared Use routes and on other permitted mixed use roads. Such increase would lead to an increase in maintenance needs, with the bulk of those needs being blading of the travel way to eliminate washboarding on those routes constructed to a higher standard – such as 6020, 5835, or portions of 5825 – where the Maintenance Level or traditional use patterns call for at least a minimum level of driver convenience.

There would be a lesser increase in maintenance needs on those native surface Maintenance Level 2 roads built to lower standards and intended for use by high clearance vehicles with no expectation of user

comfort; maintenance on these roads would primarily consist of correcting issues, such as drainage patterns off of traveled ways, that form from increased use and threaten degradation of adjacent resource values.

**Alternative C**

Implementation of Alternative C would result in 108 miles of roads under jurisdiction of the Deschutes National Forest being closed by changing their status to Maintenance Level 1. In addition, 53 miles of Forest Service roads (both Maintenance Level 1 and 2) would be converted to trails, and five miles of roads currently identified as Maintenance Level 1 would be converted to Maintenance Level 2. Total density and open-road density of all roads and Deschutes National Forest roads would be less at the analysis area scale than either Alternative A or B. At the subwatershed scale, the distribution of road/trail conversions and changes in Maintenance Level would result in a general reduction in total and open road densities, although three subwatersheds – Gilchrist Junction, Hemlock Creek, and North Paunina – would have greater total open road density than Alternative B and two – Gilchrist Junction and Odell Creek – have both higher total open road and Forest Service open road densities than Alternative A (Table 108 and Table 109).

Designation of OHV trails within the Analysis Area, along with closure of user-defined trails not incorporated into the designated trail system, would result in an increase in OHV trail density of approximately 0.1 mi/mi$^2$ at the analysis area scale over Alternatives A and B. Alternative C, in fact, would have the highest number of miles of designated trails and – at the Analysis Area scale - the highest density of OHV trails of all the alternatives at 0.42 mi/mi$^2$. The degree to which OHV trail densities would be greater or less than those of other alternatives at the subwatershed scale is widely variable, given that Alternative C would establish the most widely distributed designated trail system but would not have areas of concentrated trails to the degree that Alternatives B, D, and E – along with the existing condition (Alternative A) – would have.

Implementation of Alternative C would result in the designation of the largest amount of mixed use roads – 118 miles – as Shared Use components of the designated route system for the Three Trails OHV area. Because of this, and because of the wide distribution of designated OHV trails with few areas of concentration, Alternative C would make the most use of mixed use roads as a key component of the overall system. This would create the greatest risk for mixed use conflicts and the greatest need (due to mileage alone) for effective traffic control. The overall density of total open motorized routes (3.39 mi/mi$^2$) and of total Forest Service open motorized routes (1.77 mi/mi$^2$) would be lower than either Alternative A or B, but would be 0.01 to 0.02 mi/mi$^2$ higher than Alternatives D or E.

The 118 miles of designated Shared Use routes identified as part of the Three Trails OHV system would be distributed throughout the Analysis Area and would include not only those four-digit (collector) roads identified in Alternative B but also all or portions of Roads 4660, 4672, 4674 and 4680 in the Royce Mountain vicinity and 9751, 9753, and 9755 near Walker Rim, as well as a number of seven-digit (local) roads throughout the Analysis Area. This designation, coupled with redistribution of OHV use patterns, prohibition of overland travel and driving on Maintenance Level 1 roads, and reduction by 161 miles of Maintenance Level 2 roads within the Analysis area through closure and trail conversion, would result in focusing both highway-legal and non-highway-legal traffic onto both the designated Shared Use routes and on other permitted mixed use roads.

Identification of an OHV route system that features numerous specific mixed use roads as part of that system would result in an increase in OHV use on these roads, especially by users who come to the area specifically to ride the system. Such increase would lead to a commensurate increase in the need for maintenance blading on aggregate surfaced roads (particularly on roads such as 4672, 4674, and 6015 that do not normally receive regular blading maintenance), as well as an increased need to monitor the

condition of lower standard native surface roads for issues that may need corrective action to be taken either to protect user safety (for example, to address visibility concerns resulting from extreme dustiness on heavily used native surface roads or adequate sight distance on curves and at intersections due to encroaching vegetation) or protect adjacent resources. There would be little to no maintenance for user convenience on these low standard, high clearance vehicle roads unless passability was to become an issue.

**Alternative D**

As a result of the implementation of Alternative D, there would be 114 miles of roads under jurisdiction of the Deschutes National Forest that would be closed by changing their status to Maintenance Level 1. In addition, 43 miles of Forest Service roads (both Maintenance Level 1 and 2) would be converted to trails, and three miles of roads currently identified as Maintenance Level 1 would be converted to Maintenance Level 2. Total density and open-road density of all roads and Deschutes National Forest roads would be less at the analysis area scale than either Alternative A or B, but would be slightly higher than Alternative C (0.05 mi/mi$^2$ or less) owing to the slightly lesser number of Maintenance Level 2 roads being closed or converted to trails in this Alternative.

At the subwatershed scale, the distribution of road/trail conversions and changes in Maintenance Level would result in a general reduction in total and open road densities at the Analysis Area scale, although several individual subwatersheds would have greater total road and open road densities (both Forest Service and All Roads) than Alternative C and one – Gilchrist Junction – have higher Forest Service open road density than Alternative B (Table 108 and Table 109).

Overall density of designated OHV trails, coupled with closure of user-defined trails not incorporated into the system, would result in the second highest density of OHV trails (0.41 mi/mi$^2$), following Alternative C (0.42 mi/mi$^2$). At the subwatershed scale, the dense arrangement of trails in three general areas in Alternative D would result in it having the highest trail densities of all alternatives in five subwatersheds: Bunny Butte, Corral Springs, Little Odell Creek, Little Walker Mountain, and South Paunina (Table 110).

The overall density of total open motorized routes (3.37 mi/mi$^2$) and of Forest Service open motorized routes (1.76 mi/mi$^2$) would be just slightly less in Alternative D than in Alternative C. At the subwatershed scale, however, there would be six subwatersheds where these densities would be higher than in Alternative C because of the locally dense proposed trail layout in the Rivers North and South areas under Alternative D. The open route density in three of those subwatersheds – Bunny Butte, Corral Springs, and Little Odell Creek – would be the highest for those subwatersheds of any alternative (Table 111).

As with Alternative C, a number of open roads would be designated in this alternative as Shared Use routes to serve both as connectors between trail riding areas and as core route components of individual trail riding areas. Unlike Alternative C, there would be no such designations east of Highway 58 in the Junction area or in the northern half of the Walker area.

With 56 miles of Shared Use routes, which is less than half the miles of Shared Use routes as would be designated in Alternative C, and with the majority of those Shared Use routes being native-surfaced seven-digit local roads, any increase in blading maintenance needs resulting from increased use of dedicated Three Trails routes by OHV users would be similar to Alternative B, since only a few higher speed or aggregate-surfaced four-digit collector roads – including portions of 5830, 5835, 6015, 6020, and 9751 – would be designated as Shared Use routes.

As with Alternative C, increased use of the low-speed native-surfaced Shared Use routes (which would include some four-digit collector roads such as 5834 and portions of 9451 and 9753) would primarily

result in an increased need for monitoring those routes to identify and address issues related to user safety and resource protection, although such a need would be necessary on roughly half the miles of road as would be required in Alternative C. These roads are managed as low standard roads intended for high clearance vehicles with no consideration for user speed or convenience.

**Alternative E**

Under Alternative E, 114 miles of roads under Deschutes National Forest jurisdiction would be closed by changing their status to Maintenance Level 1. An additional 43 miles of Forest Service roads (both Maintenance Level 1 and 2) would be converted to trails, and 5 miles of Maintenance Level 1 roads would be converted to Maintenance Level 2. Total density and open-road density of all roads and Deschutes National Forest roads would be slightly higher densities than in Alternatives C and D. Alternative E densities would be roughly 0.10 – 0.15 mi/mi$^2$ less than those in Alternative B and 0.20 – 0.30 mi/mi$^2$ less than total and open road densities in Alternative A.

At the subwatershed scale, changes in Maintenance Levels and the manner in which road-to-trail conversions are distributed through the Analysis Area would result in densities that are similar to those in Alternatives C and D, although densities in several subwatersheds would be slightly higher than in those two Alternatives. Alternative E densities generally would be lower than those in Alternatives A or B.

The distribution of designated OHV trails (which features a dense array of trails in south Rivers and a more open layout in north Rivers), coupled with closure of user-defined trails not incorporated into the system, would result in an overall OHV trail density of 0.38 mi/mi$^2$, which would be slightly less than Alternatives C or D and slightly higher than Alternatives A and B. At the subwatershed scale, the arrangement of trails in Alternative D would result in it having the highest trail densities of all alternative in the Lower Crescent Creek subwatershed.

In Alternative E, the overall density of total open motorized routes (3.37 mi/mi$^2$) and of Forest Service open motorized routes (1.74 mi/mi$^2$) would be equal to or slightly lower than (within 0.02 mi/mi$^2$) those under Alternatives C and D. Alternative E overall densities of open motorized routes would be lower by larger margins than those in Alternatives A and B (Table 111).

At the subwatershed scale, there would be eleven subwatersheds where these densities would be higher than one of or some combination of the other three action alternatives. The open route density in one of those subwatersheds – Lower Crescent Creek – would be the highest for that subwatershed of any alternative (Table 111).

Under Alternative E, 80 miles of open roads would be designated in this Alternative as Shared Use routes to serve both as core route components of individual trail riding areas and as connectors throughout the Three Trails system. As with Alternative C, a number of these routes would be aggregate-surfaced roads, including all or portions of 4660, 4672, 4674, 4680, 5825, 5835, 9751, and 9755. As featured elements of the Three Trails OHV system that provide connectivity within and between various riding areas, these routes would see an increase in traffic and, similar to varying degrees with other Alternatives, there would be a need for increased blading maintenance to repair running surface washboarding. As with Alternative C, a portion of the increased wear and tear that would result in a need for blading maintenance or suffer a reduction in user convenience because of washboarding would be on roads that historically don't receive scheduled recurring maintenance, such as 4672, 4674, and 6015.

Increased use of the slower-speed native-surfaced Shared Use routes (including four-digit collector roads such as 5834 and portions of 9451 and 9753) would, as with Alternatives C and D, result in an increased need for monitoring those routes in order to identify and address issues related to user safety and resource

protection. Also, as with Alternatives C and D, there would be virtually no maintenance to address user convenience unless a route segment was at risk of become impassable.

**Cumulative Effects – Transportation System**

The combination of past access management decisions to close roads and proposed road closures and road/trail conversions in the action alternatives would result in reduction in the number of road miles open to those highway-legal vehicles that are unsuited for operation on designated trails or whose operators are uninterested or unwilling to operate on those trails. During certain time periods, in particular matsutake mushroom harvesting season, or the various hunting seasons, this would result to some degree in an increase in traffic on the remaining tertiary portions of the road system outside of the designated shared use routes, resulting in the potential need for increased maintenance on those roads. With implementation of the Forest-level Travel Management Rule and any particular action alternative, those remaining open roads would be the sole means of vehicular access to the further reaches of the National Forest Land within and adjacent to the analysis area.

## Forested Vegetation

The following incorporates the forested vegetation specialist report in its entirety. 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.

**Three Trails Planning Area**

The Three Trails OHV Project encompasses many of the forested vegetation groups found on the Crescent Ranger District. Table 112 lists the 15 plant association groups (PAG) that are currently mapped on the Deschutes National Forest. It provides the acres and percentage of the total for each plant association group that occurs within the Three Trails OHV planning area. 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, thus Volland was used.

**Table 112. Total Acres of Mapped Plant Association Groups (PAGs) and their Relative Percentages that Occur within the Three Trails OHV Planning Area**

| PAG | Deschutes Acres | Deschutes % of Total |
|---|---|---|
| Alpine Dry | 21 | 0.02 |
| Cinder* | 48 | 0.05 |
| Hardwood | 8 | 0.009 |
| Lava* | 1,293 | 1.4 |
| Lodgepole Pine Dry | 38,607 | 42 |
| Lodgepole Pine Wet | 2,901 | 3 |
| Meadow | 298 | 0.32 |
| Mesic Shrub | 813 | 0.87 |
| Mixed Conifer Dry | 24,114 | 26 |
| Mixed Conifer Wet | 553 | 0.59 |
| Mountain Hemlock Dry | 809 | 0.87 |
| Ponderosa Pine Dry | 19,202 | 21 |
| Ponderosa Pine Wet | 3,997 | 43 |
| Riparian | 330 | 0.35 |
| Rock* | 22 | 0.02 |

* Non-forested types

**Alpine Dry PAG** – Only comprising 0.02% of the mapped PAGS, this type is characterized by high elevation lodgepole pine and whitebark pine.

**Hardwood PAG** – This type includes quaking aspen (*Populus tremuloides*) stands and cottonwood (*Populus trichocarpa)* bottomlands. Associated species may include Engelmann spruce (*Picea engelmanii)*, mountain alder (Alnus incana), and red osier dogwould (*Cornus sericeus*), common snowberry (*Symphoricarpos albus*).

**Lodgepole Pine PAGS** – In central Oregon, distribution of the Lodgepole Pine Series is tied directly to ash/pumice deposits, mostly from Mt. Mazama (Simpson 2007). Lodgepole pine has the widest ecologic amplitude of all the conifers that occur in central Oregon. It dominates sites that are either too wet or dry for its competitors (ponderosa pine, white fir-grand fir, Shasta red fir, or mountain hemlock). Plant associations are grouped to reflect temperature-precipitation zones, and species diversity and productivity decline as the PAGs change from wet to dry and warm to cold. For this analysis, the Forest GIS layer included the following two PAGS:

**Lodgepole Pine Dry PAG** – Typical understory species include pinemat manzanita (*Arctostaphylos nevadensis*), long-stolon sedge (*Carex inops*), Idaho fescue (*Festuca idahoensis*), and western needlegrass (*Stipa occidentalis*).

**Lodgepole Pine Wet PAG** – Typical species include western bog blueberry (Vaccinium occidentale), Douglas' spirea (Spiraea douglasii), widefruit sedge (Carex eurycarpa).

**Meadow PAG** – Meadows are dominated by grasses, sedges, rushes, or forbs (USDA Forest Service 1988). Soils are either imperfectly-drained or saturated through most of the growing season. They are often a component of riparian areas.

**Mesic Shrub PAG** – Dominated by moisture-loving plants, willows (*Salix* spp.), mountain alder (*Alnus incana*), western bog blueberry (*Vaccinium occidentale*), Douglas spirea (*Douglasia spiraea*) are typical shrubs. Aquatic sedge (*Carex aquatilis*), sitka sedge (*Carex sitchensis*), beaked sedge (*Carex rostrata*), and tufted hairgrass (*Deschampsia caespitosa*) typically occur.

**Mixed Conifer PAGS** are composed of a mix of species that includes white fir, Douglas fir, mountain hemlock and lodgepole pine. Occasionally, western white pine and, to a much lesser degree, western larch trees, either individually or in patches, are found in this zone. Ponderosa pine is found throughout the mixed conifer zone. At the lowest elevations, which are typically on slightly drier sites, it often is the dominant species with lesser amounts of white fir, sugar pine, and lodgepole pine.

**Mixed Conifer Dry PAG** – These PAGs have moderate to high productivity and a mean annual precipitation of 20 to 35 inches. Tree species are consists of firs, ponderosa pine, Douglas-fir, larch, incense cedar, and lodgepole pine.

**Mixed Conifer Wet PAG** – Plant associations in this PAG have a higher productivity than the Mixed Conifer Dry PAG and a mean annual precipitation of 35 to 75 inches.

**Mt. Hemlock Dry PAG** –This type, which occurs between 6000-7500 foot elevation, is characterized by dense stands with closed canopies of pure mountain hemlock to stands with mixes of tree species where mountain hemlock would still be the dominant or co-dominant tree. The latter stands also have dense canopies. Understory species include woodrush (*Luzula* spp.), grouse huckleberry (*Vaccinium scoparium*), big huckleberry (*Vaccinium membranaceum*), and beargrass (*Xerophyllum tenax*). Lodgepole pine is common after disturbance.

**Ponderosa Pine Forests** are widely distributed on the east slope of the Oregon Cascades (Simpson 2007). Since ponderosa pine occupies drier sites than any other forest type except western juniper or occasionally lodgepole pine, its distribution is tied closely to available soil moisture.

**Ponderosa Pine Dry PAG** – Typical species include bitterbrush (*Purshia tridentata*), Idaho fescue (*Festuca idahoensis*), western needlegrass (*Stipa occidentalis*), green leaf manzanita (*Arctostaphylos patula*), and snowbrush (*Ceanothus velutinous*). This PAG occurs in zones that typically receive less than 20 inches of precipitation.

**Ponderosa Pine Wet PAG** – Four percent of the PAGS on the Deschutes National Forest are mapped as this type (compared to 29 percent for ponderosa pine dry PAG). The majority of this type that is currently mapped using the old plant association guide (Volland 1985) is ponderosa pine/bitterbrush-snowbrush/needlegrass.

**Riparian PAG** – Riparian zones occur along the interface between aquatic and terrestrial ecosystems (Kovalichik 1987). Typical species include willows (*Salix* spp.), mountain alder (*Alnus incana*), bog blueberry (*Vaccinium occidentale*), and Douglas spirea (*Spiraea douglasii*).

**Lava, Cinder, and Rock** – Non-forested areas.

**Direct and Indirect Effects**
**Alternative A (No Action)**
Alternative A would maintain the status quo of forested vegetation within the project area. Although typical user-created trail systems do not remove trees and take advantage of existing areas of disturbance, herbaceous cover would continue to be removed as trail systems and parking areas expand. It is estimated the user-created trail system expands at least two to five miles on a yearly basis.

**Common to all Action Alternatives**
Forested vegetation and the associated effects are closely tied to the findings for soil quality expressed in this Chapter. Essentially, it was determined activities associated with route designation (including new trail construction) and the limited vegetation clearing associated with staging areas would have an overall beneficial effect to the soil resource by placing the trail in more ecologically suitable locations, allowing natural and management-induced processes to lower the overall footprint of detrimental soil conditions within the project area.

It was also determined the effects of fugitive dust are localized and confined largely to the immediate vicinity of the motorized route. The extent to which fugitive dust occurs is variably documented in literature, and in the case of dust generation, varies by vehicle class, speed, and soil type (Goossens 2009). None of the alternatives would reduce the potential for fugitive dust in a measurable quantity over the entire project area; therefore effects to forested vegetation are immeasurable.

Converting existing roads to trails may affect future forested vegetation management by increasing the distance from open roads to treatment areas. In these situations, which are different than merely putting a road into storage (Maintenance Level 1), would require Forest Service personnel and contractors to access some work sites by non-motorized methods. This could potentially increase administrative time and contract costs by as much as 25 percent in some areas. It would also affect the possible utilization of small diameter material by restricting access and the ability to use equipment. Without road access to the site; equipment like masticators (used for grinding small trees and slash) would not be available as an option for timber management purposes potentially leaving piling and burning as the only feasible method available. In the case of timber sales it could increase the amount of temporary roads constructed for harvest activities and this, in turn, could increase the cost of the sale and decrease the amount paid to the Forest Service.

There are currently 1,337 miles of roads in the project area. Maintenance Level 1 roads receive no maintenance and are usually physically closed. It is estimated that 30 percent of these are currently unusable (K. Kittrell pers. comm. 2010). Planned OHV trail construction and designation typically uses existing areas where soil disturbance has occurred; including impassible Maintenance Level 1 roads. Depending on the alternative, between 9 and 53 miles of roads would be converted to trails making them unusable for access by motorized vehicles. However, the Forest Service's ability to management forest vegetation in these areas would be minimally affected (Table 113).

**Table 113. Probable Outcome of Miles of Roads Remaining Available for each Alternative**

| Alternative | Existing Roads Available for Management Activities | Roads Converted To Trails | Roads Available For Use |
|---|---|---|---|
| **B** | 1,337.0 | 8.9 | 1,328.0 |
| **C** | 1,337.0 | 53.1 | 1,283.9 |
| **D** | 1,337.0 | 42.8 | 1,294.2 |
| **E** | 1,337.0 | 42.6 | 1,294.4 |

Areas where active restoration restores soil properties would return to a vegetated condition ranging from immediate to five years, dependent upon whether the site is planted with native vegetation or is allowed to passively regenerate.

**Cumulative Effects**

Past, present, and foreseeable actions in Table 11 were reviewed to determine whether the direct and indirect effects expressed in this section would be magnified or changed. The zone of influence is the 93,016 acre project area. Since there is very little vegetation removal from a landscape perspective, and a finding for an overall beneficial effect to soil productivity, overlapping activities do not have a cumulative effect. The effects expressed under direct and indirect would not change.

## Climate Change

On January 16, 2009, the Washington Office of the Forest Service released guidance to Forest Service to assess the effect of proposals on the climate into project-level NEPA documents (USDA 2009d). This guidance 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.

***Assessing the Effect of the Three Trails OHV Project on Climate Change***

The Interdisciplinary Team considered relevant factors of how a designated trail system on a Ranger District could potentially affect a change in global climate. It was determined that the relationship and contribution of exhaust emissions was likely a key factor to consider. In addition, how this project would affect forests and their role in the carbon cycle was also considered.

Given the very limited circumstances when vegetation would be removed for a segment of new trail, it was determined that those activities would not be analyzed as a potential affect on global climate change. Areas of user-created trails to be rehabilitated and returned to a vegetative state would offset any actions that remove it.

Emissions from OHVs, particularly two-stroke engines (engines that use a gas and oil mixture in the combustion chamber) do not completely burn fuels. The result is an increase in emissions that contain nitrogen oxides ($NO_x$), sulfur dioxide ($SO_x$), carbon monoxide (CO) and ozone ($O_3$), which are also identified as "greenhouse gasses" (or GHG) that contribute to warming of the atmosphere. These emissions are also what the Environmental Protection Agency (EPA) identifies as criteria pollutants in which they set National Air Quality Standards. These commonly found air pollutants are found all over the United States.

The Forest Service anticipates up to 400 riders during peak times in the project area (Recreation, Chapter 3), plus approximately 200 vehicles to transport them. This equates to 600 motor vehicles emitting GHG. This represents a very small fraction of the total internal combustion engines globally emitting GHG, even with the anticipated 2.5 to 5.6 percent (15-34 engines) increase in riders annually over the next decade. Therefore, this incremental contribution to global climate change is negligible.

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 CO2 context, it is not presently possible to conduct quantitative analysis of actual climate change effects based on individual projects" (USDA 2009).

Under this definition, there would be no direct effect associated with any of the OHV action alternatives. The action alternatives do not authorize the emission of GHG; the action alternatives do not limit the emission of GHG; and, the action alternatives are unlikely to change the emission of GHG as compared to the no action alternative. In short, GHG emissions from OHV use on the Three Trails OHV project are not directly affected by the designation of routes, where monitoring of emissions and environmental conditions would be more practical.

The EPA is now implementing emissions standard requirements for two stroke (among other types) of engines (40CFR 1051). As new engines are designed to meet these criteria, older and less clean OHVs would be phased out, likely to offset the contribution from predicted increases in riders.

***Assessing the Effect of Climate Change on the Three Trails OHV Project***

Although El Niño/Southern Oscillation and the Pacific Decadal Oscillation comprise the primary factors for climate variability in the Pacific Northwest (Climate Impacts Group 2006[71]), the influence from global climate change is a growing concern. According to the Climate Impacts Group, based out of the University of Washington, climate modeling for the Pacific Northwest predicts a future rate of warming of approximately 0.5 degrees Fahrenheit per decade for the Pacific Northwest through at least 2050, relative to the 1970-1999 average temperature. Temperatures are projected to increase across all seasons, although most models project the largest temperature increases in summer (June-August), and the average temperatures could increase beyond the year-to-year variability observed in the Pacific Northwest during the 20$^{th}$ century as early as the 2020s.

Assessing these factors on manipulation of vegetation associated with trail construction and maintenance activities within the project area, a warming and drying climate combined with less of a snowpack could potentially extend the season of OHV use and subsequent associated effects.

Very little removal of vegetation would occur associated with trail construction and maintenance. A Project Design Feature was designed to, wherever possible, locate all trails to overlay existing snowmobile trails, existing user-created trails, and/or areas where vegetation and soil may be previously disturbed. Chapter 2 in this analysis discloses a season of use generally from May 01 through October 31. Monitoring is also an important element described for many resources and summarized in Chapter 2. If undesired consequences associated with an extended season are encountered, then the Forest Service has the authority to immediate suspend operation of the trail system to protect resources and/or prescribe an exact season use. Designation of a trail system allows the Forest Service greater flexibility in monitoring and adapting the project to a changing environment.

Because the designation of motorized routes has no quantifiable direct or indirect effect on climate change, it cannot have a cumulative effect.

[71] Intergovernmental Panel on Climate Change (IPCC). Their reports (2007) provide the authoritative scientific basis for subsequent Forest Service analysis of the phenomenon. Information specific to the Forest Service can be found in the latest Synthesis and Assessment Product 4.4.71

# Fire and Fuels Management

**Fire Management**
The following fire/fuels report is hereby incorporated in its entirety. The goal is to manage the fuels strata on a landscape scale, returning proper fire intervals and intensity where appropriate. This is important as it relates to a project such as this where human activity is integrated into a comprehensive fire management program where hazard and risk are assessed with multiple priorities. All wildland fire whether it be natural or human-caused is managed with an appropriate suppression response based on minimizing safety risk to life, property, loss of resources, and cost.

The Deschutes National Forest plan permits the responsible official to select an appropriate suppression response to wildfire starts within the planning areas based on management considerations. These include: land management objectives, the proximity to the wildland-urban interface, firefighter and public safety, the potential for resource damage, and projected suppression costs. Aggressive initial attack is commonly used where there is imminent threat to public safety and/or improvements on private lands provided there is a reasonable belief this first response can contain the fire at a small size and at minimal risk to fire crews.

**Walker Range Community Wildfire Protection Plan (CWPP)**
The purpose of the Walker Range CWPP is to protect human life and reduce property loss due to wildland fire in the communities and surrounding areas of the Gilchrist, Crescent, Crescent-Odell Lakes, Chemult, and the Walker Range Fire Patrol Association lands. Although reducing the threat of wildland fire is the primary motivation behind this plan, managing the forests and rangelands for hazardous fuel reduction and fire resilience is only one part of the larger picture. The goals of the CWPP are to increase public understanding of living in a fire-adapted ecosystem, instill a sense of personal responsibility for taking preventative actions regarding wildland fire, restore fire-adapted ecosystems, and improve the landscape's fire resilience while protecting other social and ecological values. To achieve these goals the plan includes the following objectives: assess the risk and hazard of wildland fire on all lands within the plan boundary, identify priorities for fuel reduction projects, examine emergency operations within the plan area and identify areas to improve community response and preparedness for wildland fire, create an action plan that prioritizes actions to reduce hazardous fuels, enhances emergency response, and strengthens public education and prevention activities (CWPP 2005).[72]

Within the Three Trails OHV project area, there are three community clusters at risk (a cluster contains nearby towns and several subdivisions that have been grouped together) as defined by the Walker Range CWPP (2005, Table 114). A community at risk is an interface community as defined in the Federal Register notice of January 4, 2001, or a group of homes and other structures with basic infrastructure and services (such as utilities and collectively maintained transportation routes) in or adjacent to federal land, has conditions conducive to large-scale wildland fire and faces a significant threat to human life or property as a result of a wildland fire (USDA Forest Service; DOI Bureau of Land Management 2004).

[72] The Walker Range CWPP is currently being updated to incorporate planned communities such as Crescent Creek Resort.

**Table 114. Communities at Risk in the Three Trails OHV Project Area**

| Crescent Lake Junction Cluster | Schoonover and Vicinity Cluster | Two Rivers North/Little Deschutes River Cluster |
|---|---|---|
| Balducci Acres | Cascade Estates | Two Rivers North |
| Brewer Ranchos | Marsha Way | Little Deschutes River |
| Cres-Del Acres | Schoonover | |
| Crescent Lake Junction | Tall Pines | |
| Crescent Meadows | | |
| Crescent Pines | | |
| Diamond Peaks/Leisure Woods | | |

***Current and Existing Condition: Fire Management***

Over the past fifteen years, periods of drought throughout the Western United States has resulted in stressed vegetation that is more susceptible to uncharacteristic wildland fire. The 2003 Davis Fire is evidenced to the extent or severity of other areas in the West. The potential for uncharacteristically large wildland fires exists on the District and Forest. The presence of forest roads and trails allows the public to access more of the forest areas. Although this affords suppression access, it also can be attributed to more human-caused fires (PNW GTR-385 1996). On the Crescent Ranger District, 52 percent of fires are contributed to lightning; the remaining 48 percent are contributed to humans. These human fires include but are not limited to; railroad, arson, smoking, and escaped campfires (Forest fire records from 2004-2008). There is one known fire caused by the use of an OHV on Muttonchop Butte in the last 15 years. This incident was a direct result of an ATV operating on steep slope while riding a trail system and rolling over, in return igniting the ground fuel.

Due to the break in fuels, the existing road and trail system within the project area can assist with fire suppression strategy and tactics. Roads and trails provide access and serve as the beginning (anchor point) of a constructed fire line and are used as the primary fire line or contingency fire line for containment purposes. Within the Three Trails OHV project area there are 1,337 miles of roads under various jurisdictions which include federal, state, county, and private entities. These roads are used for administrative and various public purposes, including recreation. All Maintenance Level 1, 2, 3, and 4 roads can be used during wildland fire response and also can be used to accomplish fuels related projects. There are 343 miles of Maintenance Level 1, 608 miles of Maintenance Level 2, 24 miles of Maintenance Level 3 and eight miles of Maintenance Level 4 roads. Fire crews and equipment would use the easiest means of getting to a fire in the shortest amount of time, including using roads not open to the public (administratively closed roads, Maintenance Level 1). If Maintenance Level 1 roads are blocked, it is a general rule that the road would be opened by using a dozer, cutting logs out, or driving around the blocked portion as the initial response time is critical in containing the fire.

From 2004-2008 on the Crescent Ranger District, 82 percent of the fires were accessed via roads. There are adjacent roads throughout the project area that support or help in the response time to a fire. These adjacent roads are usually within one to two miles apart and allow a response time under 15 to 20 minutes. Where these roads are present, suppression resources such as engines and hand crews are most commonly used. Current initial response time to the project area from first detection is 15-35 minutes. Conversely, helitack and smokejumpers respond to wildfire incidents where roads are not present, the terrain is extremely rugged and steep, or the response time is greater than 35 minutes. In some cases, temporary roads can be built during response to a wildfire if needed and deemed necessary, but this is usually associated with extended attack or long term tactics. The duty officer or line officer from the district would determine which resource would be used and how closed roads would be reopened if needed.

Initial attack resources responding to an incident within the project area would be determined by using the Central Oregon Fire Management Services (COFMS) runcards. This guide is a template for the dispatch center and the duty officer to assist in determining what type of resources is needed to suppress a wildfire efficiently. Table 115 shows an example of a runcard which is the basic needs initially required by a wildland fire that is classified as General Forest- Extreme, used during conditions of extreme fire behavior, which covers most of the project area. The runcards are not always used to the full extent, but is used as a guide for Fire Management in worse case scenarios. There are times this guide could be reduced or altered depending on fire behavior or availability of resources at the time of ignition.

**Table 115. Example of a General Forest Action Class Runcard**

| Suppression Resource Description | Initial Attack (Resources responding to incident) | Stage/ Move Up (Resources staged near incident) |
|---|---|---|
| Incident Commander (ICT3) | 1 | 0 |
| Engine(s) | 4 | 2 |
| Engine(s) ODF | 1 | 1 |
| Engines(s) WRFPA | 1 | 0 |
| Engine(s) RFPD | 0 | 0 |
| Prevention Module | 1 | 0 |
| Crews (5 person) | 2 | 1 |
| Water Tender | 1 | 1 |
| Dozer | 2 | 1 |
| Dozer Boss | 2 | 1 |
| Air Attack | 1 | 0 |
| Total | **16** | **7** |

### *Current and Existing Condition: Fuels Management*

The presence or absence of roads can affect the range of fuels treatments and suppression tactics considered to treat hazardous fuels units and suppress wildfire. Across the project area, roads and trails break up the continuity of fuels, which can slow fire spread. The use of mechanized equipment to treat natural fuel accumulations generally requires road access to the project area. Similarly, road access improves the efficiency of holding resources during prescribed burning operations and suppression operations by permitting access for engines and crews. There is a direct correlation between project cost and suppression costs per unit area and the presence or absence of roads.

**Desired Condition**

The desired condition is for the landscape, regardless of characteristic disturbance level, to be at the lowest risk as possible in order to create a safe environment for the public, including surrounding communities. Also, should fire suppression action be necessary, the fire behavior would allow a safe and successful initial attack during the first burning period.

**Fire Regime Condition Class**

Fire Regime and Condition Class (FRCC) was used in the analysis area to determine reference conditions. It would be applied and is accurate at a broad landscape scale, not on an individual unit basis. Therefore, in this analysis, it is not used as a hazard metric. Because of the controversy and simplicity of using

FRCC (Morrison and Smith 2005; Veblen 2003), FRCC was not used as the primary basis for decision making. It also was not used as a measurement in the analysis; only fire behavior measurements were used.

Many vegetation types are currently outside their historic range (Table 116). For example, ponderosa pine has an average fire regime cycle of 0-35 years with low fire behavior and low intensity. At its current level most of the Ponderosa Pine has missed this natural cycle and is susceptible to uncharacteristic fire behavior and large fire stand replacement. Lodgepole pine and mix conifer are closer to its natural FRCC with an average fire regime cycle of 35-100 years.

FRCC is a landscape classification that describes the amount of departure from the natural (historical) fire regime. They include three condition classes for each fire regime. This departure results in changes to one (or more) of the following ecological components:
• Vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern);
• Fuel composition;
• Fire frequency, severity, and pattern; and
• Other associated disturbances (e.g. insect and disease mortality, grazing, and drought).

All vegetation and fuel conditions or wildland fire situations fit within one of the three classes. The three classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural regime. Low departure is considered to be within the natural range of variability, while moderate and high departures are outside. Characteristic vegetation and fuel conditions are considered to be those that occurred within the natural fire regime. Uncharacteristic conditions are considered to be those that did not occur within the natural fire regime. Determination of amount of departure is based on comparison of a composite measure of fire regime attributes. Table 116 displays the Fire Regime Condition Classes, their descriptions, and the risk potential associated with each condition.

A “natural fire regime” is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention including the influence of aboriginal burning (Agee 1993; Brown 1995). Coarse scale definitions for natural (historical) fire regimes have been developed by Hardy et al. (2001) and Schmidt et al. (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation.

These five regimes include:
**I** – 0-35 year frequency and low (surface fires most common) to mixed severity;
**II** – 0-35 year frequency and high (stand replacement) severity;
**III** – 35-100+ year frequency and mixed severity;
**IV** – 35-100+ year frequency and high (stand replacement) severity; and
**V** – 200+ year frequency and high (stand replacement) severity

**Table 116. Fire Regime Condition Classes**

| Fire Regime Condition Class | Description | Potential Risk |
|---|---|---|
| **Condition Class 1** | Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances | • Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics.<br>• Composition and structure of vegetation and fuels are similar to the natural (historical) regime.<br>• Risk of loss of key ecosystem components (e.g. native species, large trees, and soil) is low.<br>• Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe). |
| **Condition Class 2** | Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances | • Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe).<br>• Composition and structure of vegetation and fuel are moderately altered. • Uncharacteristic conditions range from low to moderate.<br>• Risk of loss of key ecosystem components is moderate.<br>• Fire behavior, effects, and other associated disturbances are highly departed (more or less severe). |
| **Condition Class 3** | High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances | • Composition and structure of vegetation and fuel are highly altered.<br>• Uncharacteristic conditions range from moderate to high.<br>• Risk of loss of key ecosystem components is high |

Within the project area, 6.7 percent of ponderosa pine vegetation is FRCC 1/1 which falls in the natural range of historical levels desired in this condition class for low surface fires, low fire behavior, and effects which mimic the natural fire regime desired for this vegetation. The FRCC 1/2 is 65.5 percent which is a moderate departure from the historical range, resulting in higher fire behavior and a greater risk of losing key ecosystem components. FRCC 1/3 is 32.9 percent; this condition could result in extreme fire behavior with a greater chance of a large stand replacing event throughout the landscape. This departure from the natural historical levels in all FRCC's could result in more extreme fire behavior with higher mortality in the ponderosa pine vegetation.

Within the lodgepole pine vegetation, 49.8 percent of the project area is at the natural historic levels for FRCC 3/1 resulting in low fire behavior and low risk. FRCC 3/2 is 48.2 percent, which is a moderate departure from the historical fire regime of vegetation characteristics, fuel composition, severity and fire frequency. This moderate departure could result in high fire behavior and larger stand replacement events. FRCC 3/3 is 2 percent, which is within the natural (historical) range of variability of vegetation characteristics, fuel composition, fire frequency, severity, and other associated disturbances for this vegetation type.

The fire regime for Mixed Conifer have a fire return interval of 35 to 100 years and Mountain hemlock has a fire return interval of 200 + years. Both mix conifer and mountain hemlock are within the natural (historical) range of variability of vegetation characteristics, fuel composition, and fire frequency. Both vegetation types exhibit high fire behavior and large stand replacement events as part of their disturbance cycle. Table 117 shows the current levels of FRCC's throughout the project area.

**Table 117. Summary of Existing Forest Structure in the Three Trails OHV Project Area.**

| | Ponderosa Pine 22,060 | | | Lodgepole Pine 19,483 | | | Mixed Conifer 33,060 | | | Mountain Hemlock 724 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fire Regime/ Condition Class | 1/1 | 1/2 | 1/3 | 3/1 | 3/2 | 3/3 | 3/1 | 3/2 | 3/3 | 5/1 | 5/2 | 5/3 |
| Total Percentages | 6.7% | 60.3% | 32.9% | 49.8% | 48.2% | 2% | 35% | 63% | 1.9% | 98% | 2% | 0% |
| Fuel Model | TL2 | TL6 | TL9 | TL3 | TL4 | TU1 | TL3 | TL4 | TL5 | TL1 | TL3 | SB3 |
| Fire Behavior | Surface | Passive Crown | Active Crown | Surface | Active Crown | Active Crown | Surface | Surface | Active Crown | Surface | Active Crown | Active Crown |

**Table 118. Fuel Models for the Three Trails OHV Project**

| Fuel Model | Description |
|---|---|
| TL1 (181) Mountain Hemlock | The primary carrier of fire in TL1 is compact forest litter, light to moderate load. Spread rate is very low (0-2ch/hr); flame length very low (0-1'). |
| TL2 (182) Ponderosa Pine | The primary carrier of fire in TL2 is litter, low load or compact. Spread rate is very low (0-2ch/hr); flame length is very low (0-1'). |
| TL3 (183) Mixed Conifer, Lodgepole Pine and Mountain Hemlock | The primary carrier of fire in TL3 is moderate load conifer litter, light load of coarse fuels. Spread rate is very low (0-2 ch/hr); flame length low (1-4'). |
| TL4 (184) Lodgepole Pine, Mixed Conifer | The primary carrier of the fire is a moderate load of fine litter and small diameter downed logs. Spread rate is low (2-5 ch/hr); flame length low (1-4'). |
| TL6(186) Ponderosa Pine | The primary carrier of the fire is moderate load long needle litter. Spread rate is moderate (5-20 ch/hr); Flame length is low (1-4'). |
| TL9 (189) Ponderosa Pine | The primary carrier of fire in TL9 is very high load, fluffy broadleaf litter. TL9 can also be used to represent heavy needle-drape. Spread rate is moderate (5-20 ch/hr); flame length moderate (4 – 8'). |
| TU1 (161) Lodgepole Pine | The primary carrier of fire in TU1 is low load shrub and litter. Spread rate is low (2-5ch/hr); flame length is low (1-4'). |
| SB3 (203) Mountain Hemlock | The primary carrier of fire in SB3 is heavy dead and down fuel. Spread rate is high (20-50ch/hr); flame length is high (8-12'). |

## Direct and Indirect Effects

### Alternative A

Alternative A would maintain the status quo within the project area. It is estimated the user-created trail system has expanded at least two to five miles on a yearly basis.

Although there has been only one wildfire attributed to OHV use over the last 15 years, it is logical to assume this rate of ignition does not reflect the actual hazard as more user-created trails as created and

programs to check spark arrestors are infeasible due to random staging areas. Once the Travel Management Rule is implemented, motor vehicles would be restricted to designated routes and no cross-country travel. This would alleviate some risk that currently exists.

**Common to all Alternatives (B, C, D, and E)**
Alternatives B, C, D, and E would have similar effects. Within a planned trail system, the number of potential ignition sources would increase from a potential 2.5 to 5.6 percent annual increase in visitors per year. Directing use to established and designated locations allows fire management personal to focus future hazard reduction activities in strategic areas. Fuel reduction, at this time, is not considered as a connected action as part of this decision and may be planned as a separate action in the future.

The closing of roads or converting roads to trails could increase response time, strategies, and tactics used. This could result in fire suppression being more expensive as aerial forces are employed. However, road closures to offset trail construction would concentrate forest users and could lower the risk of human-caused fires. Planned closures were well coordinated in an interdisciplinary manner. Therefore, administrative access is planned to match the appropriate risk in consideration of response times and suppression forces available by season (reference Runcard discussion).

Overall, with the planned location of routes and designation of staging areas, risk is reduced because fire prevention efforts can be targeted to specific areas along with a comprehensive education program. Campfires in staging areas would be limited to approved fire pits, or not at all. Monitoring and education programs such as checking spark arrestors and updating visitors on summertime hazards can be accomplished in a few, targeted locations.

**Cumulative Effects**
As part of the overall Strategy within the project area, there are several overlapping vegetation and fuels treatments being considered or proposed. These treatments associated with Five Buttes, BLT, and Rim Paunina, resulting in approximately 20,300 acres of fuels treatment throughout the project area. These projects would have the aggregate effect of lowering the overall hazard in the area on the landscape scale.

Smoke and smoke drift from prescribed maintenance burns would have the potential to impact the Three Trails OHV area. There is the potential for portions of the trail system to be closed on burn days due to reduced visibility from smoke and any possible health concerns. Public contact and signing of the effected trail systems would be utilized to lessen the impact to forest visitors. If the fuels reduction project falls within a main trail system, then that system would be closed until the prescribed maintenance burning as been completed.

**Airsheds and Smoke**
Description of Airsheds are listed in Air Quality section of Chapter 3 and Smoke Drift Restrictions are in the specialists report located at Crescent District.

# Scenery

## Existing Condition

For the purposes of this analysis, the existing Forest Plan direction on scenic quality will be used. However, whenever possible, Scenic Integrity Objectives will also be displayed and discussed. Further direction regarding scenery management is found in Forest Service Manual 2380 (Landscape Management).

The major scenic corridors as it relates to the Three Trails OHV Project analysis area is along Highway 58 from the intersection with Highway 97 north through Crescent Lake Junction, Highway 97 from the Walker Mountain Lookout road (Road 9765) north to the border of private and federal lands near the town of Crescent, Oregon, and the County Road 61 ("cutoff road"). These areas are classified in the Deschutes Forest Plan as "Partial Retention Foreground" or a Scenic Integrity level "Slightly altered landscape with medium scenic integrity level." The scenery in the Three Trails OHV Project area is undergoing a gradual but noticeable change. Previous regeneration harvest, fire exclusion, and mortality from insect and disease have caused the scenery to develop characteristics that do not represent the historic or expected appearance of central Oregon's high desert forests. Since around the late 1990s and 2000, understory thinning projects are beginning to appear along the scenic views and change this trend. These areas have opened the stands to allow filtered views of the larger trees and middle ground landscape. Large trees make up a desired component of scenic quality and they likely represented a greater portion of the landscape in the past.

In stands of lodgepole pine, there are generally two types of forests as viewed from Highway 58. Both can be classified as mature and some forest visitors may perceive the landscape as unhealthy. One type has experienced bark beetle infestations in the 1990s and trees have died and fallen over with signs of wood cutting or salvage activity. The other could be characterized as dense, with sparse crowns and pockets of insect and disease, appearing near the end of a normal approximately 100-year cycle.

On a larger landscape, large wildfires and other forest disturbance processes are especially visible and accessible to the forest visitor along major travel corridors. These include the Davis Fire (Highway 46), Road 18 and Bessie Butte Fires (Highway 97), Awbrey Hall Fire (Highway 46 near Bend), and the Skeleton Fire, B&B, Cache Mountain and Link Fires (Highway 20), and the recent Royce Butte Fire in 2008. These events tend to change the landscape character to "distinctive," altering scenery to a degree that is perceived by many to have deviated from the landscape constituents valued for their aesthetic quality (that is, it no longer appears as natural, or whole). Landscapes are primarily viewed by two types of public: casual forest visitors who mainly are from outside the central Oregon area, and local residents who tend to be more familiar with forest succession and processes.

Table 119 displays the Scenic Views categories (by Visual Quality Objective or VQO) within the Three Trails OHV analysis area.

**Table 119. Trail Miles of Scenic Views Management Area by Visual Quality Objective in the Three Trails OHV Analysis Area**

| Visual Quality Objective-M9 | Partial Retention Foreground | Partial Retention-Middleground | Retention-Foreground | Total |
|---|---|---|---|---|
| Alt A | 10.8 | 0.9 | 0.0 | **11.7** |
| Alt B | 0.9 | 0.9 | 0.0 | **1.8** |
| Alt C | 14.9 | 1.5 | 0.1 | **16.6** |
| Alt D | 11.3 | 0.9 | 0.0 | **12.2** |
| Alt E | 11.9 | 0.9 | 0.3 | **13.1** |

***Environmental Consequences***

**Direct and Indirect Effects**

**Alternative A**

The main potential for effects to the scenery resource is within the foreground area. Alternative A would maintain the status quo within the project area until the Travel Management Project is implemented. Although typical user-created trail systems do not remove trees and take advantage of existing areas of disturbance, herbaceous cover would continue to be removed as trail systems and parking areas expand, potentially within scenic corridors. It is estimated the user-created trail system expands at least two to five miles on a yearly basis since the 1990s until the Travel Management project is implemented. These trails are typically not planned with consideration for visual quality; therefore, instead of being more subordinate to the landscape at 90 degree angles to travelways, they could potentially dominate the landscape and be parallel to scenic corridors such as Highways 58 and 97.

**All Action Alternatives**

OHV routes would be virtually invisible to the traveling public as they typically are 50 inches or less in width and are perpendicular to the scenic corridor. A typical visitor traveling 55 miles per hour (81 feet per second) or greater on Highways 58, 97, or County Road 61 (Alternative C) would have a fraction of a second to notice an OHV crossing under the highway. There are five crossings within the scenic corridors identified:

> In all three scenic routes, the main focus is on vegetation and its condition. User-created OHV trails and staging areas are virtually invisible to the visitor traveling at highway speeds.

1. Highway 97 south where an undercrossing would be constructed to link the Rivers and Walker segment- dependent upon funding sources.
2. An existing snowmobile undercrossing at Crescent Lake Junction to link area businesses and the Junction segment.
3. For Alternative C, near Crescent Creek campground crossing County Road 61 linking the Black Rock Pit play area and staging in the campground.
4. Alternatives C and E have a small perpendicular segment of trail intersecting Highway 58 that provides access to Black Rock Pit from Crescent Creek campground.
5. All action alternatives include a crossing at the junction of Highways 58 and 97 to link the Walker and Rivers segments.

Some fugitive dust may be present as vehicles pass under or over the corridors. This dust is localized with a resident time of approximately 10 seconds and has been determined to be subordinate to the main scenery. Existing staging areas incorporated into the alternative design are recessed off of the main travel

corridors because they have been used as camping areas in which users prefer somewhat of a quieter setting away from traffic associated with the highways. The action alternatives convert these existing areas into more of a controlled setting, some with bathrooms, fire pits, and designated parking.

**Consistency with the Forest Plan**

All activities planned in Alternatives B, C, D, and E are consistent with Goals, Objectives, and Standards and Guidelines in the Deschutes National Forest Plan because in Foreground areas, all activities are designed and located to blend into the natural landscape and are not visually apparent to the casual forest visitor (High Scenic Integrity). Also in Partial Retention, activities remain subordinate to the natural landscape (Medium Scenic Integrity).

In Foreground areas, visible results of the designated trail system and staging areas would not be noticeable to the casual forest visitor.

**Cumulative Effects**

Past, present, and foreseeable actions as related to scenery were considered for the Three Trails OHV project area where travelers are likely to notice change along the main travel routes. Visibility of routes and staging areas and the potential to remove screening associated with vegetation management is the key in assessing scenery. Past projects have been included in this analysis of direct and indirect effects with a finding that routes would be virtually invisible to the traveling public. However, a present project from the BLT Final Environmental Impact Statement and Record of Decision (unit 43 of the Weiser Timber Sale) would overlap the Three Trails OHV project and remove vegetation along Highway 58 using a prescription that is designed to improve and enhance overall stand composition and health, primarily in lodgepole pine. The unit is approximately 200 acres and would essentially leave all advanced regeneration and healthy trees. It has been determined that following implementation, advanced reproduction averaging 6-8 feet tall and retained trees would sufficiently screen the overlapping trail system and riders sufficiently as viewed from Highway 58. Further, a Project Design Feature (Chapter 2) would address location of routes in order to make them subordinate to the surrounding landscape as viewed from scenic travelways.

Rim-Paunina, which is a foreseeable action, focuses on thinning trees and returning a frequent fire regime primarily in ponderosa pine on Walker Rim and adjacent to the southern portion of Highways 58 and 97. This project also has potential to overlap some routes and staging areas in the Three Trails OHV Project, and is likely to be implemented prior to layout of the Three Trails OHV routes. Both projects have incorporated Project Design Features with the objective to subordinate the trail system as viewed from the scenic travelways.

# Education, Enforcement, Safety, and Operational Maintenance Plan

An emphasis would be placed on education, enforcement, safety and operational maintenance as part of the Three Trails OHV Project. The following is a successful model used by the Central Oregon Combined Off-Highway Vehicle Operations (COHVOPS). COHVOPS was first chartered in early 1998, to promote customer service and efficiency in the management of public land with a mission to partner available resources in efficient, cost-effective ways. Their purpose is to provide a high quality OHV program in central Oregon that is centered on consistency, customer service, and resource protection. COHVOPS has the latitude to cross agency boundaries and explore creative new ways of doing business.

## Safety, Education and Law Enforcement

The Safety Education strategy and Law Enforcement plan is based on the three "E" concepts: Engineering, Education, and Enforcement. The benefit of a strong safety education program is that it provides *"Education*" as a means to prevent violations through visibility, information, maps, brochures, and signing. Through education, the intent is to increase compliance, agency visibility, and visitor safety on public lands. This is achieved with on-the-ground education patrols; staffing education booths at trade shows and other OHV related events and expanding youth education programs. Other methods used to increase OHV education and safety is through informational kiosks, quality mapping and signs, and educational materials. Law enforcement actions would likely encourage compliance through education in the first couple years although it is unknown what level of non-compliance may occur initially. Last case scenario if education, monitoring, and enforcement does not succeed in correcting problems, portions of the trail system can be closed using Code of Federal Regulations prohibitions for motor vehicle use (CFR 261.16).

*Safety and Education*

The safety/education program assists in the implementation of an effective monitoring, maintenance, and enforcement program that places strong emphasis on user education, solicits user-ownership of the area, voluntary cooperation, and a self-policing atmosphere. Currently, 65 percent of the staff time combined with Trail Rangers, user groups and other volunteers is spent on the ground conducting Education Patrols. The remaining time is used for staffing education booths, teaching the ATV Rider Course, and providing personnel for presentations and special events. Volunteerism has exceeded 360 person days in central Oregon.

The Trail Ranger program has been successfully employed in central Oregon and consists of Forest Service staff and volunteers. The corps of volunteers is an important aspect of the safety/education program and they are asked to make a minimum individual commitment of 24 hours per year to the program. Initial indications through public outreach on the Three Trails OHV project has determined there are volunteers willing to help patrol staging areas and trails, provide information and maps, answer questions related to trail conditions, and talk about riding safety. Currently, COHVOPS has a bank of volunteer labor commitments from various central Oregon user groups. The collaborative effort with the Three Trails OHV Project has added volunteers through outreach in the communities of Eugene and Klamath Falls. Among tasks that have been negotiated with these groups and individuals for already designated OHV areas include trail grooming, maintenance, and annual log out of trails. They also have a volunteer Sweco (machinery uniquely designed for OHV trail maintenance) operator. Many volunteers donate the use of their personal equipment while performing services. Such donated equipment includes use of vehicles, motorcycles or ATVs, and chainsaws.

As part of a larger program, individual volunteers, Trail Rangers, and user groups assist in staffing educational booths at trade shows and other OHV events. This lends the opportunity to reach thousands of potential visitors and provide information about the trail systems, *Right Rider* ethics and education,

Tread Lightly! principles, OHV Oregon Laws and rules, equipment requirements, and Required to Ride information. The booths at these events are designed to draw in all ages, types and classes of OHV users, individuals that are new to the sport, and the general public that has an interest in OHV use. Whenever possible, the Oregon Parks and Recreation Safety program and trailer is incorporated into the educational booths.

Trail system maps are updated and reprinted as needed for distribution at the various staging areas and trailheads, as well as local vendors and agency offices. Educational materials that are on-hand at display booths come in any number of different forms; including but not limited to pamphlets, brochures, manuals, and souvenirs. Informational kiosks are located at trailheads and other key locations. These structures offer information on interpretive opportunities, fire restrictions, general area regulations, maps, invasive plant control, wildlife, and other important resource topics.

Mapping and signing are essential for updates on the status of trails/riding areas, how to get there, and how to get back. Mapping and signing makes it easier to disperse riders, increase utilization of the trail systems, increase safety, and provide a way to plan daily trips. Maps also provide another opportunity to inform users on regulations, ethics, user safety, and equipment requirements

*Law Enforcement*

The Forest Service has the responsibility of enforcing the laws of the United States including Titles 16, 18 and 21 United States Code (USC) as well as the Code of Federal Regulations (CFRs) promulgated under the authority granted in16 USC §551. Those regulations can be found in CFR, Title 36, Part 261, Subpart A, B and C. Subpart A regulations apply to all National Forest System Lands. Subpart B is Special Orders that apply to specific National Forest System lands such as Regions, Forests, Grasslands, or specific Ranger Districts. Subpart C regulations apply to specific Regions and have gone through the rulemaking process. The CFRs are implemented to address violations that affect National Forest System lands. Violations that affect NFS lands include, but are not limited to, interference with Forest Officers, disorderly conduct, fire, timber, forest products, livestock, fish and wildlife, property, occupancy and use, Forest roads and trails, OHV use, wilderness, and primitive areas.

There are several methods to gain compliance of National Forest System rules and regulations. The primary method to gain voluntary visitor compliance is through proper area engineering coupled with an effective education component. Easily understandable signs, substantial public education and well engineered barriers to prevent trail proliferation are essential components for success. With these components in place it allows law enforcement to focus on a smaller number of “willful violators”.
The first line of enforcement is all Forest Service employees. All Forest Service employees are considered Forest Officers and serve as the eyes and ears for the agency. These employees are required to document and report any incidents they observe involving the violation of the laws of the United States including the CFRs.

The second line of enforcement is Forest Protection Officers (FPOs). FPOs have authority to issue citations for CFR violations committed on National Forest System lands. These violations typically involve littering, resource damage, OHV violations, and area closures. FPOs also gain compliance through public education during field contacts. Most FPOs work seasonally, but there are also many who work under a full-time status for the Forest Service.

The third line of enforcement is Forest Service Law Enforcement Officers (LEOs). LEOs patrol for and respond to calls for service for CFR violations, state law violations, other federal crimes, and investigations that are more serious in nature. LEOs also gain compliance from offenders through warnings and education.

Forest LEOs can also assert their federal and state arrest authority for those violations that warrant it. Along with protecting the National Forest natural resources, LEOs also provide for the safety of forest visitors, Forest Service employees, Forest Service volunteers, and other government agents.

Having an enforcement presence on the ground encourages public awareness of responsible use, increases compliance with OHV rules and regulations[73], and promotes the protection of natural resources within the recreation areas of central Oregon. An increased presence of law enforcement officers at the staging areas, on the trails, in the dispersed riding areas, and with overflights, gains rider buy-in to the rules and regulations, and reduces acts of violence, violations, and other related offenses. Law enforcement officers support trail and riding ethics and promote OHV education, which relates to the safety of the trail users. A law enforcement presence allows for faster response times to accidents, emergencies, search and rescues, and violations.

The goal of a successful enforcement program is demonstrated by a very high rate of user compliance, which is presently the case within the current designated trail systems in central Oregon. To aid in monitoring effectiveness, each patrol officer records hours of patrol time, contacts made, locations of contacts, types of violations, warnings written, and citations issued. This data is entered into a nation-wide database called LEMARS (Law Enforcement Monitoring and Reporting System). This data is then used to determine areas where education patrols or enforcement patrols are most needed and most effective. It also helps indicate where additional signing, information kiosks, and trail maintenance may be needed or required.

Trail Rangers employed by the Forest Service have the authority to issue citations, although the main emphasis is education. Volunteers that patrol as part of the Trail Ranger program are used to enhance the routine enforcement by Forest Protection Officers, Forest Service law enforcement officers, and the County Sheriff Patrols.

Full time law enforcement officers spend approximately five percent of their time conducting OHV compliance patrols. They have the ability to patrol OHV areas on Class I and III ATVs, all other patrols are by vehicle. This includes the intermittent use of aerial patrols throughout the spring and fall. Prineville BLM makes up the overall staffing of patrol officers in central Oregon with one full time and one three quarter time BLM Law Enforcement Rangers. The Forest Service is staffed with six law enforcement officers: three located in Bend, one in Crescent, Sisters, and Prineville. These officers are responsible for law enforcement on the Deschutes and Ochoco National Forests, and the Crooked River National Grassland, which encompass just over 2.5 million acres. These lands extend about 100 miles along the east side of the Cascade Mountains crest and eastward into the Ochoco Mountains. The officer that is stationed at the Crescent Ranger District responds to calls anywhere in central Oregon and vice versa. Also, there are approximately 25 Forest Protection Officers. Although the FPO and LEO presence on the Forest is limited, the Forest receives help from Deschutes County with a cooperative deputy. At this time, there is no cooperative deputy from Klamath County; however there are currently four (and sometimes five) full time Sheriffs that have a primary responsibility to designated motorized trail systems are also eligible for funding opportunities for user education and law enforcement through the Oregon Parks and Recreation's OHV funds that are not available for enforcement of non-designated areas. This source has helped the COVOPS organization to fund four to five full-time Deputy Sheriffs with focused responsibility on designated motorized trail systems.

Currently, law enforcement as it relates to OHV use is increasingly difficult for LEOs and FPOs to address due to the vastness of the affected area, understaffing, and the burden of proof on the Forest Service to substantiate resource damage, if a Notice of Violation is CFR 261.12c or CFR 261.15h. From

[73] Monitoring has shown a high level of compliance on designated trail systems in central Oregon managed by COHVOPS. The referenced monitoring data is available at Crescent Ranger District.

2005-2009 only four law enforcement actions (one Notice of Violation) on the Crescent Ranger District were for this type of violation. There were also 10 for noise (261.15d) and 54 for lack of an ATV operating permit[74].

The Action Alternatives plus the Travel Management Rule would substantially reduce the area where motor vehicles can legally operate by designating a trail system within a 93,016 acre project area. The remaining area would be closed to motorized travel except on Maintenance Level 2-5 roads, or the implied policy "Closed unless Posted Open". The Action Alternatives would allow for a better enforcement management program since the Motor Vehicle Use Map would ensure the public's awareness as to what is open to OHV recreation and what is closed. It would also make the public aware that anything outside the proposed roads, trails, and designated staging areas are closed to OHV use without the need of posting area closures.

The Action Alternatives would also allow for less complicated enforcement efforts by LEOs and FPOs when they encounter OHVs outside the proposed roads, trails, and area. Anyone outside the proposed OHV roads, trails, and area would be in clear violation with regard to possessing a vehicle off the road. The Action Alternatives would make it more difficult for those willing to build unauthorized trails outside the proposed OHV roads, trails, and area. This is due to the fact that they typically use OHVs to carry equipment out to areas where unauthorized trail building is taking place. This in turn makes it easier to track anyone conducting this type of unauthorized activity.

Part of the strategy for Law Enforcement personnel would be to allow the public to gain knowledge of the new rules and system through information provided by law enforcement personnel, OHV volunteers during field contacts, at trailheads and staging areas, and at the Ranger District Office.

Staging areas offer a centralized area for law enforcement personnel to provide compliance emphasis with regard to CFRs and state laws. They also provide a centralized area where equipment checks could be conducted.

[74] Obtained using LEIMARS (Law Enforcement and Investigations Management and Records System)

## Operations and Maintenance

In order to provide a high quality, well maintained trail system, the Three Trails OHV project would endeavor to utilize the assets in the Central Oregon Off-highway Vehicle Operations (COHVOPS) Operations and Maintenance program. Through formation of one OHV team, it provides the most efficient staffing, equipment, and materials necessary to operate and maintain the central Oregon OHV trail systems.

Through consistent operations and maintenance, the trail system in Three Trails OHV trail system would be maintained in a condition where the width, depth, drainage, and control of the OHV riders to keep within the parameter of the designed trail. The maintenance performed is dependent on moisture and weather conditions. The maintenance schedule and priorities may change during the year depending on unusual climatic events, shifts in use patterns, or updated information obtained from condition surveys. Most maintenance would be performed mid-week to avoid conflicts and safety issues with the OHV customers.

COHVOPS currently manages eight designated trail systems with 605 miles of trails, 35 miles of shared use roads, and eight designated OHV play areas. Timely maintenance keeps the integrity of the trials in check by logging out fallen trees, keeping impinging brush from forming, and maintaining proper drainage to confine potential undesired off-site effects. It also keeps moguls from forming, which can potentially be a hazard to trial users. Routine activities include an annual sign maintenance program.

The following are specific details involved in the proposed trail maintenance program:

- **Condition Surveys** – Periodic condition surveys would occur for the trails, play areas, staging areas, and facilities within each of the OHV riding areas to provide an assessment of priority maintenance. The condition of each trail, the number and condition of all trail signs, condition of fencing, road crossings, play areas, staging areas, camping areas, and access roads would be documented.
- **Trail Logout** – Trees that fall across trails create obstacles that must be removed before user-created trails are developed around the blockage. Trail logout takes place as trails open in the spring, after major windstorms, and periodically throughout the year to make certain there are no trees blocking the trails. Much of the logout would be accomplished by volunteers supporting the program.
- **Trail Grooming** – Trail grooming slows the development of trail moguls or whoops, fills holes and ruts, and improves the riding surface of the trails. Regular grooming has many obvious benefits for riders and keeps them confined within the trail system, but it also extends the interval of time before reconstruction becomes necessary. Trail grooming normally occurs during the spring and the fall when there is enough moisture in the ground to solidify the trail tread. Currently, COHVOPS averages 250 miles of trail grooming during a normal year.
- **Trail Reconstruction** – Grooming is an excellent tool to defer trail reconstruction, but when the moguls become too large, it becomes necessary. Trails are generally reconstructed every three to five years, depending on use. Trails at the core of the system may need to be reconstructed annually due to extremely high use levels. Trail reconstruction may also be used to change the design of a trail and create a higher quality riding experience. A winding trail also slows the riders down making the trail safer and decreases the development of moguls. After reconstruction, the trails remain temporarily closed until the grooming is complete and the tread has solidified. Most trial reconstruction in the same timeframe as grooming. Currently, approximately 80 miles of trails are reconstructed by COHVOPS annually.

- **Facility Maintenance** –This includes cleaning and pumping of toilets; site maintenance of staging areas and camp sites, maintenance of kiosks, map boxes and split rail fencing, garbage removal, litter cleanup; and repairs from vandalism.

- **Sign Maintenance** – Signs and accurate maps are one of the key elements in customer service and keeping riders where they are designated to ride. Currently, COHVOPS maintains over 5,000 signs within the existing central Oregon trail systems, staging areas, access roads, and play areas. They are frequently in need of repair or replacement due to damage from the elements, vehicles, or vandalism. Missing, damaged, or vandalized trail signs would be replaced as soon as possible. The priority would be to replace safety signing, such as yield, yield-ahead signs, and shared use road signs.

- **Equipment Maintenance** –Use of specialized equipment requires a good maintenance program. Equipment expected to be used includes chain saws, Swecos, ATVs, and motorcycles as part of the education and enforcement program.

## Operations and Maintenance Guidelines

- An annual trail maintenance plan would be prepared that would outline the trails/areas to be worked on and the recommended treatments. All maintenance performed would be recorded on a maintenance log to facilitate future planning and accounting of work accomplishments.
- Trail condition surveys and monitoring would be performed to identify maintenance needs. Any undue hazards that are identified would be treated as a priority.
- Once heavy maintenance is performed with the Sweco, the trail would be closed until enough moisture is received to firm up the trail tread.
- To improve the flow of the trail and reduce the potential for widening, curves would be super elevated where practical.
- Trail grooming would be performed on high use trails to slow the growth of moguls and maintain a smooth tread. Once moguls have developed to the point that users ride off to the side of the trail, the trail would be scheduled for reconstruction. Generally, trails that have been reconstructed most recently would receive priority for grooming.
- Any off-trail tracks would be raked out or obliterated.
- Dead, inflexible limbs and stubs would be pruned during regular maintenance. To the extent possible, pruned limbs would be cut flush with the trunk.
- During logout, an adequate width and turning radius would be maintained; the cut material would be strategically placed to prevent shortcutting the trail, or to deter any off-trail use.
- When a trail follows a closed road, cut material from logout would be staggered randomly from one side to the other so that an “S” alignment is created. The cuts would not exceed the recommended clearing widths so the trails would not be passable by full-sized vehicles.
- Trees that are leaning over the trail or suspended over the trail may be left in place if they are more than six feet above the trail tread and there is adequate sight distance in both directions to see and react to the potential obstacle.
- Any trail signs that are vandalized would be replaced as soon as practical. Replacing safety and regulatory signs would be a priority.
- Generally, no maintenance would occur at play areas unless unsafe holes or ledges develop. Play areas would be checked regularly for signing or fencing damage and other needs.

- All trailheads, staging areas, and facilities would be maintained to clean and safe conditions, having the appearance being sanitary, well kept, and maintained.
  - Trailheads, staging areas, and camps would be patrolled 2-3 times per week during the primary season. Litter would be picked up, signs replaced, fences repaired, and bollards installed as needed. Vault toilets would be checked and cleaned at least weekly during the prime season and as needed during the shoulder seasons. Toilets would be checked daily during holidays and other peak days. Vaults would be pumped as required.
  - Kiosks would be checked weekly, faded or damaged posters, signs, and maps would be replaced as needed.
  - Map boxes would be stocked weekly, or more often as needed.
  - Entry signs would be checked regularly for vandalism and repaired or replaced as needed.
  - Gravel roads are maintained by the road crew on an annual basis.
  - The trail groomers are utilized to maintain the parking areas and spurs as needed.
  - Vandalized facilities would be repaired or replaced as soon as practical.

The following identifies management practices and operational guidelines for minimizing potential effects to adjacent resources that have been identified for avoidance of motorized use:

- Potential effects to sensitive resources are mitigated by avoidance through trail location, site hardening, use of physical barriers, seasonal closures, and other effective mechanisms.
- Vegetation removal is kept to a minimum. Most maintenance requires only minor trimming of overhead vegetation or removal of fallen trees.
- If monitoring indicates that a decline in user experience or unacceptable numbers of riders are using a trail system, an assessment of the need to implement a method designed to control and/or limit the number of riders would be developed.
- Through consistent operations and maintenance, trails are maintained in a condition where the width, depth, drainage, and control of the riders is adequate to protect adjacent resources; trails are kept within the parameter of the designed trail management objectives; and in a condition that provides for user safety.
- Informational kiosks, located at trailheads and other appropriate locations, are used to provide information on general area regulations, maps, invasive plant prevention, wildlife and resource protection, fire restrictions, and interpretive opportunities.

Trails maps are provided at all trailheads, staging areas, kiosks, and offices. The maps provide information on regulations, signing, ethics, safety, as well as trail locations.

## Public Health and Safety

Safety of the riders is a main consideration when designing, engineering, and maintaining a trail system. Considerations for trail use and design are based on modes of travel, amount of use, rider experience, mixture of uses, geography, topology, soils and weather conditions. Signs, gates, turnouts, surfacing, trail widening, trail realignment, speed limits, clearing, parallel routes for different modes of travel, and allowing only certain modes of travel are all ways to mitigate for safety.

One of the most effective ways to increase rider safety and minimize off-trail travel access is by providing challenging and satisfying OHV riding opportunities. Proper trail flow (curvilinear alignment and undulating grades), circular rather than parabolic curves, and climbing turns (instead of switchbacks) would be employed to encourage riders to stay on the trail. Curvilinear design may help abate driver speed and also may reduce the number of trees needing to be removed during construction. Barriers, signs, and other trail delineators would be employed to reduce rider confusion. Suitable access to vista points and attractions are also included in some of the alternatives to encourage riders to stay on designated routes (Crimmins 2006). User challenge and interest on new trails may be heightened by offering a range of trail difficulty levels (Crimmins 2006). The Forest Service Trails Handbook (FSH 2309.18) describes the construction and maintenance standards for ATV trails, motorcycle trails, and four-wheel drive routes. Construction of new trails would conform to these standards. Roads proposed for conversion to motorized trails would be modified to meet these standards over time. FSH standards help provide for user safety and they help prevent resource damage.

Development of a sign plan is part of Alternatives B, C, D, and E. The objectives of the plan are to (1) describe recreation opportunities including route difficulty levels and indicate appropriate vehicle classes, (2) encourage responsible and ethical behavior, (3) promote resource protection, (4) increase user safety, and (5) inform users about laws and regulations. Comprehensive signing is important for effective OHV management; however, the motor vehicle use map (MVUM) would be the overriding law enforcement instrument for OHV management.

A designated trail system would also incorporate trail rangers (volunteers or paid staff that monitor, educate, and help with compliance) information kiosks, trail maps, and signs. In addition, federal law enforcement officers would enforce the rules and regulations within the project area.

Supplemental analysis would be performed on certain designated mixed-use roads in the analysis area that have been determined to be unsuitable for a mixture of OHVs and highway-legal vehicles because of either their current setting or their designation as roads maintained for passenger car use (on which non-highway-legal vehicle use is prohibited). In particular, this supplemental Engineering Analysis would be performed on portions of Roads 5825, 5830, and 6020 to determine what requirements would be necessary to allow for safe use by a mix of highway-legal and non-highway-legal vehicles. A Project Design Feature is included that posts all shared use routes within the Three Trails OHV Project area with confirmation signing for the presence of OHVs.

Non-designated user-created trail systems near subdivisions and other population centers adjacent to or within the forest boundary would be closed. This would displace some current users who prefer the advantage of being able to drive out their garage right onto an OHV trail. Routes near the subdivisions that have the potential for this additional mixed-use traffic are being considered and reflected in the engineering analyses for designation of motorized mixed use routes.

Increased use of the low-speed native-surfaced Shared Use routes (which would include some four-digit collector roads such as 5834 and portions of 9451 and 9753) would primarily result in an increased need for monitoring those routes to identify and address issues related to user safety and resource protection, although such a need would be necessary on roughly half the miles of road as would be required in Alternative C. These roads are managed as low standard roads intended for high clearance vehicles with no consideration for user speed or convenience.

To improve rider safety the following Project Design Features have been incorporated: 1) building an underpass on Highway 97 south of the junction of Highways 97 and 58 to allow safe OHV passage connecting the Rivers and Walkers riding areas. 2) There would be a railroad crossing provided off the 5825260 spur near Two Rivers North subdivision.

**Public Health**

The Clean Air Act lists 189 hazardous air pollutants to be regulated. Some components of smoke, such as polycyclic aromic hydrocarbines (PAH) are known to be carcinogenic. Probably the most carcinogenic component is benzo-a-pyrene BaP. Other components, such as aldehydes, are acute irritants. In 1994 and 1997,[75] 18 air toxins were assessed relative to the exposure of humans to smoke from prescribed and wildfires.

The five toxins most commonly found in prescribed fire smoke were:

**Particulate matter -** Particulates are the most prevalent air pollutant from fires, and are of the most concern to regulators. Research indicates a correlation between hospitalizations for respiratory problems and high concentrations of fine particulates ($PM_{2.5}$, fine particles that are 2.5 microns in diameter or less). Particulates can carry carcinogens and other toxic compounds. Overexposure to particulates can cause irritation of mucous membranes, decreased lung capacity, and impaired lung function.

**Acrolein -** An aldehyde with a piercing, choking odor. Exposure severely irritates the eyes and upper respiratory tract.

**Formaldehyde -** Low-level exposure can cause irritation of the eyes, nose, and throat. Long-term exposure is associated with nasal cancer.

**Carbon Monoxide -** CO reduces the oxygen carrying capacity of the blood, a reversible effect. Low exposures can cause loss of time, awareness, motor skills, and mental acuity. Also, exposure can lead to heart attack, especially for persons with heart disease. High exposures can lead to death due to lack of oxygen.

**Benzene -** Benzene causes headache, dizziness, nausea and breathing difficulties, as well as being a potent carcinogen. Long-term exposure can cause anemia, liver and kidney damage, and cancer.

A part of the overall strategy, there are other vegetation and fuels treatments projects being considered or proposed that would overlap the Three Trails OHV project area. These projects include Five Buttes, BLT, Crescent Lake WUI, and Rim-Paunina, resulting in approximately 20,300 acres of fuels treatment (reduction of hazardous fuels) throughout the Three Trails OHV project area and surrounding landscape.

[75] Results of an April 1997 conference to review the results of health studies and develop a risk management plan for the protection of fire crews were published by Missoula Technology Development Center in Health Hazards of Smoke, Technical Report 9751-2836-MTDC.

The closest Designated Area to the project area is the city of Bend, Oregon; the communities of Crescent, Chemult, and LaPine are closer to the project area but are not as well populated. The greatest risk of exposure to airborne toxins from prescribed fires or wildfires would be to firefighters and forest workers implementing prescribed burning. It is unlikely the general public would be exposed to toxin levels adverse to human health during implementation of prescribed burning operations in and around the Three Trails OHV project area because of the distance from populated areas and the application of prescriptions designed to lessen the release of particulate matter. People who suffer from breathing ailments may experience some difficulty during periods of prescribed burning, especially during atmospheric conditions that do not favor dispersion of smoke. The signing of project activity areas in addition to notification of trail closures would promote a safe environment for riders and/or forest visitors during implementation of prescribed burning or associated operations dealing with timber/biomass removal from one of the vegetation projects.

The Forest Service voluntarily follows the guidelines assigned by Oregon Smoke Management to limit state-wide exposure on a cumulative basis, in compliance with the Clean Air Act. All project activities carried out by Forest Service and Forest Service contract employees would comply with State and Federal OSHA standards.

Particulate matter can be created by dust from vehicle travel over a dry and unpaved road surface, from engine exhaust, and vehicle emissions. These can also be sources of fine particulate matter that contribute to the greenhouse gases associated with climate change. Fine particulate matter has a possible correlation to health related problems in some people (EPA 2008).

Fugitive dust is created when the soils crust is disturbed or broken and soil particles are released and raised into the air by air currents generated by vehicles (Ouren et al. 2007). Dust dispersal patterns consistently indicate larger particles stay closer to the ground and travel shorter distances, while smaller particles go higher in the air and travel further away from the source (Padgett 2006). Road surface type, speed, and vehicle type all play a part in how much dust is created (Goossens and Buck 2009).

Emissions from OHVs, particularly two-stroke engines, (engines that use a gas and oil mix in the combustion chamber) can also contribute to decreased air quality. That is because two-stroke engines do not completely burn the fuels resulting in increased emissions containing nitrogen oxides ($NO_x$), sulfur dioxide ($SO_x$), carbon monoxide (CO) and ozone ($O_3$). This would be most evident in staging areas where engines are started and warmed up. New engine emission standards set by the EPA for nonroad engines (recreational vehicles, snowmobiles, diesel marine engines) require 100 percent phase-in in 2007 (40CFR 1051). As new engines are designed to meet these criteria and older and less clean engines would be phase out, contributing to a reduction in emissions and an increase in air quality.

Although there may be some localized air quality impairment from vehicle emissions and fugitive dust in areas experiencing a high level of motorized cross-country travel, this is assumed to be minimal because none of the alternatives are very unlikely to change the net amount of motorized use across the Forest, 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.

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## Social and Economic Analysis

Social and economic elements, which are interrelated and interdependent with ecological elements, comprise the human components of the ecosystem.

The implications of resource management decisions for the Three Trails OHV Project to the social and economic values are of interest to the residents, business owners, and users of the area. These people have made their interests known through organized group and personal efforts. Their interests, issues and concerns have helped formulate the purpose and need for action and identify the issues connected with achieving the purpose and need elements discussed in Chapter 1.

This section would focus on:

1. A review of the social and economic conditions of Klamath County, Oregon, using census and other sources of data.
2. A review of key social and economic relations between the communities and the uses and services provided by the Federal lands in the Three Trails OHV analysis area.
3. A discussion about how the alternatives affect conditions, relationships and values of the community members.

**General Social and Economic Features**

The primary area of consideration is Klamath County, Oregon. A small part of the Crescent Ranger District is located in Deschutes County. The Klamath or "Clamitte" tribe of Indians, for which Klamath County was named, has had a presence in the area for 10,000 years. White settlement began in 1846 along the Applegate Trail, which precipitated clashes between the Klamath Indians and the White settlers and culminated in the Modoc War of 1872. The Legislative Assembly created Klamath County on October 17, 1882. Linkville, later known as Klamath Falls, was named the county seat.

More white settlers were drawn to the area in the early 1900s with the coming of the railroad and the heavily taxpayer-subsidized creation of the Klamath Irrigation Project, a federal reclamation project. It drained much of the Lower Klamath Lake and Tule Lake to convert 188,000 acres of lakebed and wetland to irrigated farmland.

**Population**

According to the US Census 2006 estimate, the population of Klamath County was 66,438. The county covers an area of 6,136 square miles: the population density is currently 11 persons per square mile. The population growth of the county compared to the state, according to the Bureau of Economic Analysis Regional Economic Information System (BEA REIS 2006) Table CA30, was 31 percent from 1970 to 2006. County population growth did not keep pace with state and national growth.

Age distribution for the 40-54 age bracket (Baby Boom in 2000) in Klamath County, grew the most from 1990 to 2000. The percentage of young people under age 20 declined slightly, while the percentage of older people 65 years and older increased slightly.

By far, whites are the most numerous ethnic group. Next are Hispanic at 7.8 percent of the population followed by a little over 4 percent American Indian and Alaska Native.

**Economic Conditions**
Historically, Klamath County has devoted its economic base to farming, timber, and wood products manufacturing. Although these industries currently provide a smaller contribution to the county's current economic activity than they once did; they are still important in community identity and local politics.

The largest employer in the area is Sky Lakes Medical Center; however, few or no residents of Crescent or Gilchrist are employed there. In Klamath County, the Medical Center is followed by Klamath County School District and Jeld-Wen, a company that manufactures windows and doors. During the past few years, the county has experienced a housing construction boom. The area is attractive to retirees from more densely populated areas of California. There is a destination resort planned near the end of the Wild and Scenic segment of Crescent Creek near the town of Gilchrist, OR. It would be located on private land and called Crescent Creek Resort. Currently in the land permitting phase with the State of Oregon, the applicant requests approval of a Master Development Plan for 9,100 acre (+) Destination Resort with approximately 2,750 residence/lodging units and recreational amenities in a forestry zone. With the siting of the resort, use of the river would increase dramatically, as residents and visitors learn about the recreation opportunities on the adjacent National Forest at their backdoor. Recreation – including fishing, hunting, and hiking – contribute to the appeal of the area and its economy. Crater Lake National Park, which attracts approximately half a million visitors a year, also contributes to the local economy. The area is also popular for bird watching, particularly at Crescent Creek Campground.

**Employment**
From 2001 to 2006, total employment in Klamath County increased from 32,576 jobs to 35,441 jobs. The principal industrial sectors in Klamath County remain the same. They are government and government enterprises. The second largest is retail trade followed by health care and social assistance. Between 2001 and 2006, government and government enterprises lost a few jobs, while retail trade gained more than 200 jobs. The health care and social assistance sector gained more than 700 jobs. Other important employment sectors in Klamath County are the manufacturing, accommodation, and food services sector, farm employment, and construction. A major change over the five years from 2001 to 2006 was the decline in jobs in the forestry, fishing, and related activities sector. This sector declined by 17 percent to 628 jobs.

**Table 120. Klamath County Employment**

| | **Full and Part-time Employment by Year** | | |
|---|---|---|---|
| | **2001** | **2004** | **2006** |
| Total employment | 32,576 | 33,219 | 35,441 |
| Farm employment | 2,038 | 2,078 | 2,065 |
| Nonfarm employment | 30,538 | 31,141 | 33,376 |
| Forestry, fishing, related activities, other 1/ | ***755*** | ***741*** | ***628*** |
| Mining 1/ | ***14*** | ***30*** | ***78*** |
| Utilities | 92 | 121 | 122 |
| Construction | 1,933 | 1,706 | 2,213 |
| Manufacturing | 2,740 | 2,754 | 2,872 |
| Wholesale trade | 769 | 788 | 919 |
| Retail trade | 3,983 | 3,974 | 4,198 |
| Transportation and warehousing | 1,015 | 972 | 1,060 |
| Finance and insurance | 919 | 1,256 | 869 |
| Real estate and rental and leasing | 1,151 | 1,182 | 1,435 |
| Professional and technical services 1/ | 1,036 | ***1,036*** | 1,073 |

| | Full and Part-time Employment by Year | | |
|---|---|---|---|
| Management of companies and enterprises 1/ | ***1,213*** | ***722*** | ***1,121*** |
| Administrative and waste services 1/ | ***284*** | ***1,047*** | 1,700 |
| Health care and social assistance | 3,216 | 3,777 | 3,998 |
| Accommodation and food services | 2,508 | 2,448 | 2,744 |
| Other services, except public administration | 1,812 | 1,917 | 2,072 |
| Government and government enterprises | 5,547 | 5,561 | 5,451 |

1/ Some undisclosed REIS data are estimated using IMPLAN data. These data are indicated by bold italics.

Source: Regional Economic Information System, Bureau of Economic Analysis (BEA REIS), U.S. Department of Commerce (Table CA25 NAICS).

The poverty rate for Klamath County is higher than that of the state. Approximately 17 percent of individuals had income that was below the poverty line in 2007. The percentage in Oregon as a whole was 12 percent.

From 1970 to 2006, average earnings per job, adjusted for inflation, have fallen from $36,288 in 1970 to $32,470 in 2006. In 2006, average earnings per job in Klamath County, Oregon ($32,470) were lower than the state ($40,818) and the nation ($47,286).

Per capita income, adjusted for inflation, has risen from $19,812 in 1970 to $26,908 in 2006. Average per capita income in the county was $26,908. That is lower than the state average of $33,299 and the national average of $36,714 in 2006.

In the last 36 years, non-labor sources of income grew at an annual rate of 3.6 percent, outpacing labor sources which grew at a 0.7 percent rate. In 2006, 44.0 percent of total personal income was from non-labor sources. These sources include dividends, interest, and rent as well as transfer payments from governments to individuals, such as Medicare, Social Security, unemployment, and disability insurance. From 1970 to 2006, 72.1 percent of new income was from non-labor sources.

The largest components of non-labor income are from dividends, interest, and rent. In 2006, welfare represented 8.4 percent of transfer payments and 2.1 percent of total personal income.

In 2007, the unemployment rate was 7.0 percent compared to 5.2 percent in the state and 4.6 percent in the nation (Figure 35). Since 1990, the unemployment rate varied from a low of 6.7 percent in 2006 to a high of 10.4 percent in 1993. Monthly unemployment rates are higher in the winter compared to the summer.

**Figure 35. Annual Average Unemployment Rate Compared to the State and the Nation**

Source: Regional Economic Information System, Bureau of Economic Analysis (BEA REIS), U.S. Department of Commerce (Table CA25 NAICS).

## Primary Uses of Forest Lands

### Timber Harvest

Timber harvesting has been a key use of forests in Klamath County. Production in the 1980s was nearly half a billion board feet per year. For example, in 1986, a total of 462 million board feet were harvested. Of that, 281 million board feet, about 61 percent, was harvested from Forest Service land. During the 1990s harvest levels declined sharply. In 2006, approximately 152 million board feet were harvested in Klamath County. Of that total, 29 million board feet, or 19 percent, was harvested from Forest Service land.

Klamath Falls has two mills that process logs. One is Thomas Lumber, which produces lumber for Jeld-Wen, the manufacturer of windows and doors; the other produces dimensional lumber. Timber cut from the Crescent and Chemult Ranger Districts is rarely or never sent to the dimensional lumber mill in Klamath Falls. The closest mill to Crescent and Chemult is Interfor Pacific in Gilchrist. Wood from the Crescent and Chemult Ranger Districts is also sent to two mills in John Day, a dimensional mill for pine in Warm Springs, and two mills in White City/Medford and Roseburg. There are some small manufacturing mills that produce windows and doors in Prineville and Redmond. There is also a small molding mill in the town of Crescent that employs about 10 people. It is dependent on byproduct from the local mill.

### Non-timber Forest Products

Matsutake mushrooms are a valuable commercial special forest product that grows on the Crescent and Chemult Ranger Districts. The mushroom harvesting season runs from September to November and the

harvesting community has been vocal in their concerns that disturbance to the soil or activities that open the tree canopy could reduce either matsutake habitat or productivity. Project Design Features for all action alternatives was designed to address these concerns. Chapter 1 displays stakeholder collaboration.

Local businesses enjoy a 'mini boom' with the influx of approximately 1,000 harvesters for the two month harvest season, purchases of miscellaneous consumables and fuel increases. The local community at Crescent Lake Junction also has the opportunity to rent 'buying station' spots to the commercial buyers for the duration of the harvest season.

**Recreation**
Recreation, including fishing, hunting, and hiking, adds to the appeal of the area and its economy. Crater Lake National Park, which has approximately half a million visitors a year, contributes to the local economy (Reference the Recreation section in this chapter).

**Hunting**
Hunting plays a big part in the local economy, based on figures from Oregon Department of Fish and Wildlife and Travel Oregon contracted with Dean Runyan and Associates in 2008 to conduct an economic analysis by county of Fishing, Hunting, Wildlife Viewing, and Shellfishing Recreation in Oregon: 2008 Trip Characteristics and Expenditure Estimates. Survey results showed that participants spent the following amounts on hunting and wildlife viewing in Deschutes, Klamath, and Lake Counties:

| County | Hunting | Wildlife Viewing |
|---|---|---|
| Deschutes | $8,480,000 | $44,291,000 |
| Klamath | $4,214,000 | $14,931,000 |
| Lake | $2,773,000 | $ 4,940,000 |
| Total | $15,467,000 | $64,162,000 |
| State Total Percent | 11.4% | 13% |
| State Total | $136,042,000 | $495,260,000 |

Courtesy of ODFW and Dean Runyan and Associates 2008

In Klamath County, hunting for deer on Walker Rim, both bow and arrow and rifle (eight weeks total), brings a potential economic boost every fall, not only from the hunting license fees but food, gas and other amenities. There are eight campsites at Boundary Springs (a primitive designated camping area) and 13 other dispersed sites along major green dot roads up along the Walker Rim, and each campsite usually average two ATVs. The cost of gas to the vehicle to haul the ATVs and other hunting gear, plus usually a camper or RV for the hunters to sleep in means local gas stations and small stores would benefit. Local motels in Gilchrist, Crescent and Crescent Lake Junction also see an increase in use during the fall hunting season.

Potential effects to big game are discussed further in the Big Game section in this chapter.

**Social and Economic Effects**
The social and economic effects are evaluated using several indicators, including jobs, income, potential effects to big game and matsutake production, and physical and social environmental health (e.g. environmental justice).

The effects of each alternative on social values associated with different lifestyles are estimated from the standpoint of how different components of the local population may perceive the goals, objectives, and management activities associate with each alternative. 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, such as recreation both motorized and non-motorized, 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 forests as ecosystems than they have been previously and is more concerned with having access to decisions about them."

Here in the West, in places where land use has been relatively unrestricted, there is increasing conflict over 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 people living nearby who depend on these lands for their livelihood and recreation. There is particular concern about the loss of traditional uses of the land, such as livestock grazing and off-highway vehicle use. People with these concerns seek a balance to what they consider to be environmental extremism with economic and human concerns.

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 in the 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 social pressures to a way of sharing experiences with family and friends; from casual to organized activities."

The Three Trails OHV Project and the Travel Management Rule are shifting the philosophy that many users on national forest lands have long been accustomed to. Lands that have always been open unless designated closed are soon to be changing their status, under the Travel Management Rule. No longer would they have unrestricted cross-country travel but would be limited to riding within designated off-highway vehicle areas or on designated trails. Some expressed that this is more of the government taking away their rights, while others expressed that this is the government finally stepping up and protecting the natural resources they are responsible for managing for future generations.

From the comments received during scoping on the Three Trails OHV Project proposed action, both motor vehicle and non-motor vehicle use proponents believe that both uses are appropriate on public lands; however the amount of each use and where it occurs are at issue. Public comments described the following as important to maintain or attain the values from national forest lands. These values became significant and non-significant issues.

- Motor vehicle recreation opportunities
- Non-motorized recreation opportunities
- Potential user interactions or conflicts
- Resource protection
- Protection of wildlife and habitat
- Access
- Economics: cost and tourism
- Implementation and administration

Motor vehicle users indicated that wilderness areas, roadless areas, and Oregon Cascade Recreation Areas (OCRA) provided adequate non-motorized recreation opportunities, while non-motorized users believe that there are too many roads on national forest lands now, and increasing the number of OHVs and their increased capacity to go more places has put natural resources at risk and increased incompatibility between both user groups. An example of this incompatibility is access for hunting and viewing of elk. Many users find OHV access improves their elk hunting or viewing while other users believe that OHV access negatively impacts their elk hunting or viewing experience.

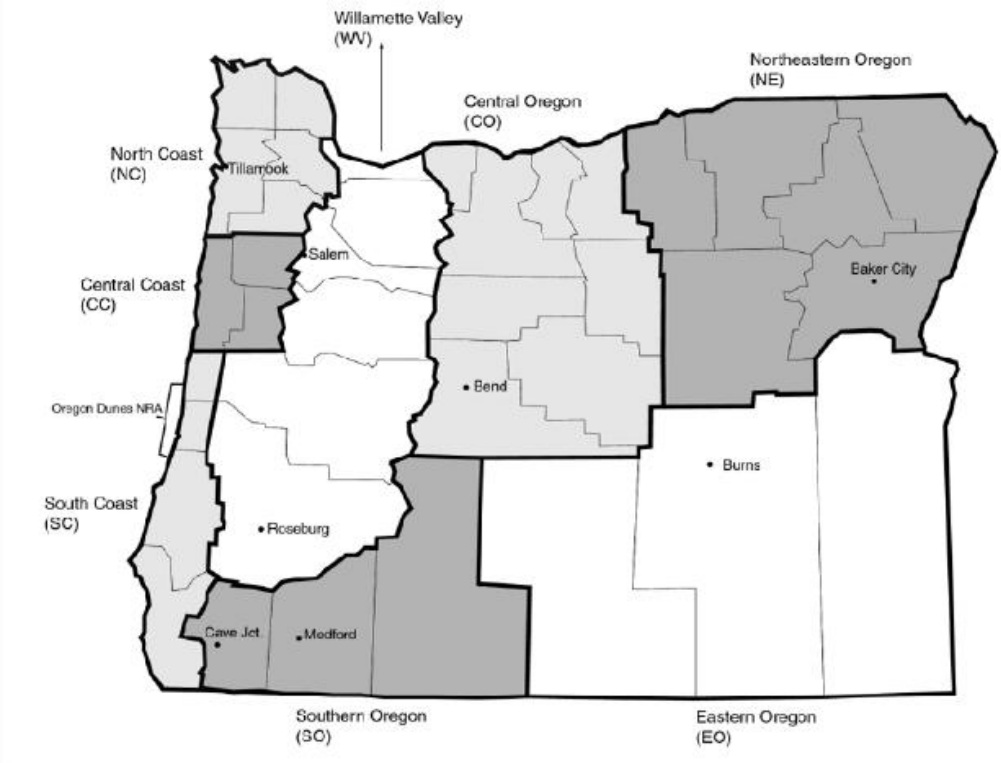
Both motor vehicle and non-motorized user groups indicated that they made choices to live near the national forest because being able to recreate in, or enjoy the serenity of, national forest lands was important to themselves, their families and their lifestyles. Two Rivers North, a private subdivision, with a mix of full-time residents and summer recreation residences surrounded by national forest lands is such a community. Some bought houses there as a place to go and get away from the noise and enjoy the peace and quiet of being surrounded by forests. Others bought because they wanted to be able to ride their ATV's or dirt bikes out of the garage and onto National Forest lands or up into Muttonchop pit to play. In many cases it is third generation riders now learning on these very lands.

Recreational residences such as those found along the shores of Crescent and Odell Lakes are defined by their scenic amenities and recreational opportunities (rural recreation and residential, as defined in the Deschutes LRMP). Local service-oriented businesses are the major economic driver in these communities, including restaurants, resorts, and sporting goods.

In contrast, the communities of Gilchrest, Crescent, and Crescent Lake have historically relied upon logging as the primary economic driver. These communities are unincorporated and are considered rural industrial (as defined in the Deschutes LRMP). Effective leadership has been emerging in recent years, in part, because of the population shift from absentee to full-time residents. Thanks to the development of local Community Action Teams, most with local organizations as members, these communities now have the ability to come together twice a month and are developing multiple subcommittees to focus on emerging local issues such as OHV use. Many of the locals ride themselves, some for sport, some to ride for pleasure, and others to go visit the neighbors.

This project includes contributions to local and regional economies. Socially, it starts at the local level where community input helped design the trail system and volunteer workers would help to build it. This pride in 'ownership' in helping to create an OHV trail system that responds to riders experience and desires would pull riders from other areas to utilize the new system (an estimated 2.5 to 5.6 percent increase in riders per year). Economically, it would benefit the small communities of Crescent, Gilchrist, and Crescent Lake that are growing more dependent on the revenue from outside recreationists. A well thought out and maintained trail system for OHVs would boost summer community revenue.

A study was done by Oregon State University, Cascade Campus (Lindberg 2009), on OHV 'Rider Demographics and Preferences'. The areas are divided into the following regions:




Based on survey results the number of Oregon residents who ride are:

| Oregon OHV permits by class and owner residence | | | |
|---|---|---|---|
| | **In-state** | **Out-of-state** | **Total** |
| **Class I (ATVs)** | 84,832 | 18,010 | 102,842 |
| **Class II (4-wheel drives)** | 24,988 | 5,264 | 30,252 |
| **Class III (Motorcycles)** | 28,985 | 5,205 | 34,190 |
| **Total** | 138,805 | 28,479 | 167,284 |

The Lindberg (2009) analysis in *The Economic Impacts of Off-Highway Vehicle (OHV) Recreation in Oregon* shows that regionally the sport is growing in popularity. In the nine years between 1999-2008, the number of households that own recreational OHVs has doubled (28,635 to 68,202 with Southern Oregon (Klamath, Jackson, and Josephine counties) accounting for 14 percent (9,311) of the households in the state of Oregon that own OHVs. The rider base in Northern Klamath County is from groups out of the Willamette valley (Roseburg to Albany) and Klamath Falls, OR that must travel to desired rider areas. Riders from the Willamette valley average 0.5 trips to the Southern Oregon region each year with an estimated 14,500 trips (Lindberg 2009). The resultant economic impact to this area is 32.2 million dollars in just output alone (food, fuel, lodging etc). Labor income adds another 8.5 million resulting in 312 new jobs to support this growing sport. The closest OHV retail shop is 45 miles away from the project area yet with ever-changing technology, sport shops that sell, upgrade, or repair OHVs would see a gain in their customer base as well.

Trends of recreational use on the forest are increasing (see Recreation section), so the overall effects on communities surrounding the forest are expected to remain stable or to increase under any alternative.

Volunteer activity to help maintain roads and trails throughout the forest would continue under any alternative. Volunteer groups are an important resource in management of any OHV designated trail system, with hundreds of hours of labor as well as capital being invested each year. Because volunteer work is not contracted and can change year to year, it is difficult to include exact cost savings by alternative associated with this work. Volunteer activity is acknowledged as an important piece of forest management and is assumed to be stable for all alternatives.

Alternatives B-E were designed to avoid the most productive matsutake mushroom sites, based on historical data from the harvesters, Forest Service contracted sugarstick (*Allotropa)* surveys, and the Alliance of Forest Workers and Harvesters. The area west of the 5834 road between Crescent Lake and Two Rivers North subdivision was also identified by the harvesters and designated trails were excluded from this area. Although some potential matsutake mushroom habitat would be affected when new trails are constructed due to compaction or removal of soils (this could remove the fungal mycelia) it would be very small compared to the overall project area. The Three Trails OHV project would have no noticeable change to the overall matsutake harvest.

Alternatives B-E also provides a separation of uses between the motorized community and the non-motorized community potentially providing a higher quality experience for the non-motorized visitor.

## Air 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 ($PM_{2.5}$ and $PM_{10}$), ozone, and sulfur dioxide.

State Implementation Plans (SIPs) 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 (EPA) how it would 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 of specific national or regional natural, scenic, or historic values." Class I airsheds 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 of Class I airsheds allows only very small increments of new pollution above existing air pollution levels, Class I airsheds have the highest air quality protection standards, in part, because visibility was identified as an important value while Class II airsheds have a moderate level of protection. Airsheds within the Three Trails OHV project area are described below.

## Class 1 Airshed

Class I airsheds are protected by the Prevention of Significant Deterioration (PSD) program and include national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value. Diamond Peak Wilderness and Mount Thielsen Wilderness are Class I airsheds (OAR 340-204-0050). They are also considered a "smoke sensitive area." Diamond Peak Wilderness is immediately adjacent to the project area in the Junction segment. Mt. Thielsen Wilderness is approximately five miles west of the Rivers segment.

## Class 2 Airshed

Attainment areas that are neither industrialized nor meet the specific requirements for classification as Class I areas. They are protected by the PSD program.

The Three Trails OHV planning area is a Class 2 airshed. Approximately 6,000 people live in the surrounding small town communities such as Sunriver, LaPine, Crescent, Gilchrist, and Crescent Lake Junction; however a percentage of the populations live in the wildland/urban interface surrounding these towns.

## Designated Area

Those areas identified as principal population centers or other areas of requiring protection under state or federal air quality laws or regulations.

Bend is classified as a "Designated Area" by the Oregon Smoke Management Report. The Three Trails OHV Project area is located approximately 51 miles southwest of Bend, Oregon.

To date, the urban and industrial centers adjacent to the Deschutes National Forest 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 National Forest, 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 lightweight soil particles or "dust" resulting from vehicle travel on unpaved surfaces (also known as fugitive dust) 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).

## Background

### *Fugitive Dust*

"Fugitive dust" is the term used when the soils crust is disturbed or broken and soil particles are released and raised into the air by air currents generated by vehicles (Ouren et al. 2007).

Soil disturbance and migration are items to be considered in any setting where motor vehicle travel is off hardened surface roads. These soil particles, created when the crust is disturbed, are considered particulate matter. Particulate matter is a mixture of small liquid droplets and microscopic solid particles that can be formed or emitted directly into the air (including dust, dirt, smoke and soot) The haze associated with air pollution is caused when these tiny particles scatter or absorb visible light (McCarthy et al. 2006; EPA 2010). The EPA (2009) defines the following sizes of particulate matter:

- Ultrafine particles generally defined as those less than 0.1 microns.

- $PM_{2.5}$, also known as fine fraction particles (generally defined as those particles with an aerodynamic diameter of 2.5 microns or less) usually 1/30$^{th}$ the diameter of a hair.

- $PM_{10}$ (generally defined as all particles equal to and less than 10 microns in aerodynamic diameter; particles larger than this are not generally deposited in the lung).

The Clean Air Act directs the EPA to set standards for particulate matter in the form of primary and secondary standards (Table 121). Primary standards set limits on the amount and size of particulate matter that could be injurious to human health, while secondary standards set public welfare limits (damage to crops, animals, visibility impairment protection). These pollutants are currently under review by the EPA to determine what are appropriate levels to reduce potential impacts on human health.

***Although health studies have shown a correlation between high particulate concentrations and adverse health effects, there were no definitive studies that identified which pollutants are responsible for the health effects (McCarthy et al. 2006).***

McCarthy et al. (2006) describe the dust plume raised by passing vehicles as $PM_{10}$ whereas the emissions created by engine combustion are usually $PM_{2.5}$. The smaller size of the $PM_{2.5}$ particles allows for easy ingestion into human lungs and has been linked to health issues, such as asthma and strokes (EPA 2003). Road surface type, speed, and vehicle type all play a part in how much dust is created (Goossens and Buck 2009).
Consistent dispersal patterns indicate that larger particles travel shorter distances and stay relatively close to the ground while smaller particles go higher into the air and travel further away from the source (Padgett 2006). Wind direction, velocity, and canopy cover are factors in dust dispersal patterns and distance. Riders generally do not ride on hot summer days due to the dry and dusty conditions. Optimum riding is typically in the slightly cooler and wetter spring months and in the fall.

The more open the trail terrain with adequate air circulation the faster the dust particles dispersed and conversely, if the riding area was under heavy canopy with poor air circulation dust particles hang in the air for longer amounts of time (Meadows et al. 2008).

### *Emissions*

Emissions from OHVs, particularly two-stroke engines (engines that use a gas and oil mixture in the combustion chamber), can also contribute to decreased air quality. This is because two-stroke engines do not completely burn fuels resulting in increased emissions containing nitrogen oxides ($NO_x$), sulfur dioxide ($SO_x$), carbon monoxide (CO) and ozone ($O_3$). Research has shown that a small two-stroke engine (e.g. chainsaw, which is considerably smaller than a standard two-stroke OHV engine) running for two hours emits the same amount of hydrocarbons as driving 10 fuel-efficient cars for 250 miles each (http://www/arb/ca/gov/msprog/offroad/sm_en_fs.pdf). Pollutants emitted from exhaust can create varying impacts of vegetation.

The U.S. Environmental Protection Agency (EPA), as directed by the Clean Air Act, set national air quality standards for six common pollutants, also referred to as "criteria pollutants." These pollutants, carbon monoxide (CO), lead (Pb), nitrogen dioxide ($N_2$), Ozone ($O_3$), particulate matter (PM), and sulfur dioxide ($SO_2$), damage crops, reduce visibility, combine with other pollutants to form wet and dry acids (acid rain), and prevent heat from escaping into space thus contributing to the increasing concentrations of greenhouse gases that are considered responsible for climate change. Weather plays a part in the formation of some pollutants like ozone. Hotter, drier weather means higher ozone levels (EPA 2008), but the reduction of nitrogen oxide ($NO_x$) emissions reduces ozone levels.
These standards, known as National Ambient Air Quality Standards (NAAQS) consist of two types:

- *primary standards* to protect public health with an adequate margin of safety, including the health of sensitive populations such as asthmatics, children, and the elderly; and
- *secondary standards* to protect public welfare from adverse effects, including visibility impairment and effects on the environment (e.g., vegetation, soils, water, and wildlife).

**Table 121. Criteria Pollutants, Standards, and Review Status**

| Pollutant | Primary Standard(s) | Secondary Standard(s) | Status of Review |
|---|---|---|---|
| Ozone | 0.075 ppm (8-hour) | Same as Primary | Review completed 2008; the previous 0.08 ppm standard remains in effect |
| Lead | 0.15 μg/m$^3$ (3-month) | Same as Primary | Review completed 2008; the previous 1.5 μg/m$^3$ standard remains in effect |
| $NO_2$ | 0.053 ppm (annual) | Same as Primary | Primary standard review to be completed 2009; secondary standard review of $SO_2$ and $NO_2$ to be completed 2010 |
| $SO_2$ | 0.03 ppm (annual) 0.14 ppm (24-hour) | 0.5 ppm (3-hour) | Primary standard review to be completed 2010; secondary standard review of $SO_2$ and $NO_2$ to be completed 2010 |
| $PM_{2.5}$ | 15 μg/m$^3$ (annual) 35 μg/m3 (24-hour) | Same as Primary | To be completed 2011 |
| $PM_{10}$ | 150 μg/m$^3$ (24-hour) | Same as Primary | |
| CO | 9 ppm (8-hour) 35 ppm (1-hour) | None; no evidence of adverse welfare effects at current ambient levels | To be completed 2011 |

Units of measure are parts per million (ppm) or micrograms per cubic meter of air (μg/m$^3$). For more information about the standards, visit http://www.epa.gov/air/criteria.html (EPA2008).

Table 121 shows the criteria pollutants and their current allowable limits. These limits are currently under review by the EPA to determine if the levels set in the 1990s are still appropriate or if more stringent measures are needed to reduce the potential impacts on greenhouse gases and human health. Previously, just registered vehicle engines (passenger cars and trucks) were tested and had exhaust emissions criteria set. Historically nonroad engines (recreational vehicles, diesel marine engines, and snowmobiles, etc.) were not required to have emissions standards. The EPA started implementing emissions standard requirements for these type engines (off-highway motorcycles and ATVs) in 2006 with 100 percent phase-in in 2007 (see 40CFR 1051). As new engines are designed to meet these criteria, older and less clean OHVs would be phased out over the next five to ten years.

**Direct and Indirect Effects**

**Alternative A – No Action**

Under the No Action Alternative, fugitive dust is present and a result of cross-country travel along user-created trails and existing motorized travel on established roads. When the Travel Management Rule is implemented with motorized travel on designated routes the dust would be localized close to the designated trails within the trail system.

**Alternatives B through E**

The action alternatives affect where motorized 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 motorized cross-country travel. 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 Forest, 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.

The alternatives 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 B through E, motorized cross-country travel would be limited, starts associated with motorized use would be more accessible to suppression resources and potentially more rapidly extinguished, thereby reducing emissions. However, this effect on air quality from human-caused wildfire that could be attributed to starts from OHVs within the designated trail system area 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.

In Alternatives B-E in the Junction segment near the Sno-park, staging areas, and more concentrated loops in Alternative D, the opportunity for riders to encounter fugitive dust and associated dust particles with potential to affect human health would be the greatest. Although riders tend to utilize the trail systems during the seasons when dust can be avoided[76], the potential for exposure to dust during the core summer season is the greatest. Motor vehicle travel on unpaved or native surface roads would produce dust but most would settle back out quickly and close to the trail. Some of the lighter particles would travel higher in the air and farther from the trail, but given the open nature of the trail design and air circulation, these would settle out in relatively short distances. Presently, this increased effect is assumed to be minimal as the dry summer months often discourages users when dusty conditions are likely.

For all alternatives there may be some localized temporary air quality impairments from vehicle emissions and areas prone to dust. This would be particularly evident in staging area where engines are started and warming up. However, from an airshed perspective, the Three Trails OHV area is 50 miles from the nearest area designated as potentially air quality impaired (Bend, Oregon). Any localized impairment would be diluted to a scale that would be impractical to measure. A projected 2.5 to 5.6 percent early increase in riders would not change this condition.

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.

**Cumulative Effects**

For all of the Alternatives, smoke and smoke drift from prescribed maintenance burns would have the potential to impact the Three Trails OHV area. There is the potential for portions of the trail system to be closed on burn days due to reduced visibility from smoke and any possible health concerns. The prevailing winds are out of the southwest and normally would push the smoke east away from the Wilderness areas (Mt Thielsen and Diamond Peak) and from population centers like Bend.

[76] 2009, communication with Vicki Ramming, COHVOPS Program Director

Implementation of the Travel Management Rule across the Forest would reduce fugitive dust by restricting motorized cross county travel. Rim-Paunina and BLT are ongoing forest thinning projects in the Rivers and Walker segments of the project area. These overlapping projects could potentially reduce the time the dust is in the air by opening stands, thus allowing for increased air circulation and settling the dust more quickly. Fugitive dust and its effects would remain localized and does not change the disclosures for human health or water quality.

Potential cumulative effects include a prescribed burning program that overlaps the project area, and a foreseeable action of 13,000 acres of prescribed fire in the vicinity of Walker Rim (Rim-Paunina project). Although it is acknowledged that prescribed burning releases common criteria pollutants, such as CO, the overlap of effects cannot be expressed as an aggregate.

# Other Disclosures

## Forest Plan Amendments

There are four site-specific amendments to the Deschutes National Forest Land and Resource Management Plan (Forest Plan) as amended common to all action alternatives for the Three Trails Off-Highway Vehicle (OHV) Project. The project area straddles the Northwest Forest Plan line and includes a wide range of Management Areas which include proposed amendments to the Intensive Recreation (MA-11), Old Growth (MA-15) management areas, as well as the Key Elk (Appendix 16, Habitat Area).

**Proposed Amendments**

The following identifies the apparent need for site specific amendments to the Forest Plan, followed by a section that explains the proposed change and need for that change.

**1. & 2. Designation of Motorized Recreation within Intensive Recreation**

**1).** Within the area of the Junction Sno-Park and adjacent lands (345 acres) surrounding the Crescent Lake Landing Strip to the north of the private land at Crescent Lake Junction (T23 S, R6 E, S36 and T24 S, R6 E, S1) the following 1990 *Deschutes National Forest Land and Resource Management Plan* Standard and Guideline for Intensive Recreation applies to the actions being proposed: M11- 40 (p. 4 - 138) "off-highway vehicles will normally not be encouraged in the Management Area, especially in areas where recreation use is concentrated." Instead, in all alternatives, the project proposes a site specific Forest Plan amendment to authorize Class I and III off-highway vehicle use by designating trails radiating from an existing Sno-Park as a staging area.

**2).** Also within the area of the Junction Sno-Park and adjacent lands (345 acres) surrounding the Crescent Lake Landing Strip to the north of the private land at Crescent Lake Junction (T23 S, R61/2 E, S36 and T24 S, R61/2 E, S1) the following 1990 *Deschutes National Forest Land and Resource Management Plan* Standard and Guideline for Intensive Recreation applies to the actions being proposed: M11-15 (p. 4 -137) "new trails constructed in this Management Area will emphasize walking, bicycle riding, and hiking opportunities." Instead, in all alternatives, the project proposes a site specific forest plan amendment to authorize Class I and III off-highway vehicle use by designating trails and an existing Sno-Park as a day use staging area.

**Need for Amendments and the Change Being Proposed**

The Three Trails OHV Project is consistent with the 2005 Travel Management Rules by designating motorized routes appropriate for OHVs to operate. This is supplemented by the 1990 Deschutes National Forest Standards and Guidelines TS-1 (p. 4 -72) which states "Adequate access to and within the Forest will be provided and will include travel by foot, horse, aircraft, watercraft, and motorized vehicles of all types" and TR-19 (p. 4-33) that states "in areas of the forest where there are extensive motor vehicle closures, a better public service will be provided by designating trails or areas that OHVs can operate legally."

There has been overwhelming support from stakeholders, including the Crescent Lake Community, to link up to the proposed trail system with the local businesses on both sides of the highway. The Crescent Lake Junction Sno-Park is the only area suitable for staging as there are no other accessible large parking areas nearby and it overlaps the Intensive Recreation allocation. Also, there is only one opportunity for OHVs to safely cross under Highway 58, at the snowmobile undercrossing, to access Crescent Lake Junction businesses located on the east side of the highway. Forest Plan allocations that encourage motorized vehicle operation and private lands also considerably limit the opportunities. The entire OHV trail system proposed at Crescent Lake is bordered by designated Wilderness to the west, private land to the south and surrounding the businesses, and the Davis Late-Successional Reserve to the north and east,

with Riparian Reserves throughout. Finally, there are impediments such as major paved roads where non-highway legal OHVs cannot operate and the Burlington-Northern railroad tracks. What remains are a very limited subset of public lands that are designated for Intensive Recreation (Administratively Withdrawn and Matrix) that are available for designating motorized trails.

The proposed change to the Forest Plan is to designate a staging area at the Crescent Lake Sno-Park, associated 8+ miles of user-created trails, and an informal play area in the Intensive Recreation Management Area as a feature common to all alternatives.

Extensive winter and summertime motorized and unregulated use is already occurring in the Crescent Lake Junction area, including in the Intensive Recreation allocation.

By allowing and designating motorized use within the Intensive Recreation allocation, a "turn key" staging area with a parking area, bathroom, and shelter could be utilized in the summer when it receives little to no use. Nearby businesses provide the overnight accommodations. Also, existing trails for snowmobiles could also be utilized without further disturbance of resources, thus limiting the amount of new trails that would need to be constructed. TR-21 (p. 4-33) supports this action: 'in addition to winter use of OHVs the Forest will provide additional opportunities for summer use of OHVs and other OHVs such as motorcycles.'

**3. Muttonchop Butte Old Growth Management Area**

Within the area of Muttonchop Butte (T25 S, R7E, S35) the following 1990 *Deschutes National Forest Land and Resource Management Plan* Standard and Guideline for Old Growth applies to the actions being proposed: M15 -1 (p. 4 -149) "concentrated human activity is not compatible in this Management Area, but dispersed recreation is generally acceptable." Instead, in Alternatives B, C, and E the project proposes a site specific forest plan amendment to designate a trail system and play area that essentially concentrates use within the Muttonchop Pit in the Muttonchop Old Growth Management Area (Figure 37).

**Need for Amendments and the Change Being Proposed**

Muttonchop Butte is a Designated Old Growth area totaling 361 acres, which is comprised mostly of mixed conifer (dry) Plant Association Group (PAG) and was established for the focal species goshawk and American marten. Elk use the top of the butte on a seasonal basis. The surrounding Management Area is allocated to General Forest lands. Currently, Muttonchop Pit which overlaps the designated Old Growth area is an unofficial OHV "play area" near the Two Rivers North subdivision that receives extensive motorized vehicle use. In addition to the suitable habitat removed by the Muttonchop Pit, approximately 80 acres on the south side of the butte has experienced a stand replacement wildfire.

In all action alternatives, the project proposes to move the entire Old Growth area to an area closer to the Oregon Cascades Recreation Area to allow continued use of the Muttonchop Pit as an OHV play area, and to provide a large block of mixed conifer habitat for the focal species.

The proposed amendment would move the Old Growth area in its entirety to replace Matrix (would become Administrative Withdrawal (AWD) under the NWFP) lands to better serve the focal species. The Muttonchop Butte Pit and the stand replacement wildfires would revert to General Forest land while the remaining portion of the Butte, equal and above 5,000 feet in elevation, would be allocated to Scenic Views, Partial Retention (background) for mixed conifer where no OHV trails are designated. There would be no net change in total acres, but there would be a change in acreage allocations.

The proposal would serve multiple purposes. It allows an existing use to continue under Alternatives B, C, and E with Project Design Features that consider noise to the nearby community of Two Rivers North

subdivision. It also would provide homeowners that live in the subdivision and forest visitors with scenery of the highest butte in the vicinity.

**4. Hemlock Key Elk Area**

The Proposed Action and Alternative C would designate a motorized trail system area that overlaps the Hemlock Key Elk Habitat Area (Appendix 16-6) near the Two Rivers North subdivision. This would bring the Standard and Guideline WL-45 (p. 4-56) into relevance: 'Where management would encourage public use of travel ways outside the area if a conflict with elk use occurs, and elk habitat improvements must be compatible with recreation and visual objectives.' Instead, in all action alternatives the project proposes a site specific forest plan amendment to adjust the boundaries of the Key Elk habitat into more favorable foraging habitat to reduce conflicts with elk use (Figure 37).

**Need for Amendments and the Change Being Proposed**

The Hemlock Key Elk area encompasses 2,511 acres and is comprised of lodgepole pine PAG with riparian areas interspersed throughout. It is adjacent to the Two Rivers North subdivision (T25 S, R7 E, S8, 9, 10, 11, and 12). It is very important for elk calving, thermal and hiding cover and is bordered to the west with similar habitat with a low density of roads due to riparian resources. Currently, the portion that borders the subdivision to the south is developing an extensive user-created OHV trail system. All action alternatives would designate trails within the area, rehabilitate others, and replace a portion of the Key Elk where trails are designated by expanding the boundary and replacing habitat to the west (T25 S, R7 E, S2, 3, 4, 9, 10, and 11). The proposed change would increase the stringer meadows available for foraging and calving. The change would also reduce the road densities: WL-46 "Open road densities should not exceed an overall average between 0.5-1.5 miles per square mile within each key area, unless impacts on elk can be avoided, or the proposed project would result in a net benefit to elk habitat."

**Table 122. Road Densities within the Existing and Proposed Hemlock Key Elk Area**

| Hemlock Key Elk Area | Acres | Total Open Roads | Density Total FS Roads mi/mi² | Density FS Open Roads mi/mi² | Total FS "Open Motorized" (non-level 1 + User defined routes) mi/mi² |
|---|---|---|---|---|---|
| Existing KEA | 2,511 | 8.23 | 3.85 | 2.1 | 3.43 |
| Proposed KEA | 2,511 | 2.76 | 2.16 | 0.7 | 0.70-0.81 |

As displayed in Table 122, the road density for the existing Hemlock Key Elk Area exceeds the Forest Plan recommendation of 0.5 -1.5 miles per square mile of land. This is due to two major collector roads (5825 and 5830) that provide primary access to a considerable amount of National Forest system land. They also bisect the relatively small Key Elk Area contributing to the high open road density. With the proposed Key Elk Area, the 5830 road is now totally outside the boundary, thus reducing the road density to range between 0.70-0.81 if an action alternative is selected.

The proposed Forest Plan amendment would shift the Hemlock Key Elk area to the north thus moving the overlay for the proposed Key Elk area entirely over General Forest in the Deschutes National Forest Land and Resource Management Plan (Figure 36 and Figure 37). The existing Key Elk area has approximately 1/3 of its acreage under the Northwest Forest Plan Matrix allocations and 2/3 under General Forest of the Deschutes National Forest Land and Resource Management Plan. Land allocations in the new area would stay General Forest in the Deschutes Land and Resource Management Plan, and Riparian Reserve-allocated lands in the Northwest Forest Plan as the Key Elk area is an overlay to the existing land

allocations. The previous location of the Key Elk area would remain General Forest in the Deschutes Land and Resource Management Plan and Riparian Reserves, and Matrix in the Northwest Forest Plan. The following factors would be used to evaluate change to the Deschutes National Forest Land and Resource Management Plan Environmental Impact Statement: timing, location and size, goals, objectives and outputs, and management prescriptions. There are four site-specific amendments, two are proposed for the designation of Motorized Recreation within Intensive Recreation Allocation (MA-11), one is the Muttonchop Butte Old Growth Management Area (MA-15), and the last is Hemlock Key Elk Area (Appendix 16, Habitat Area).

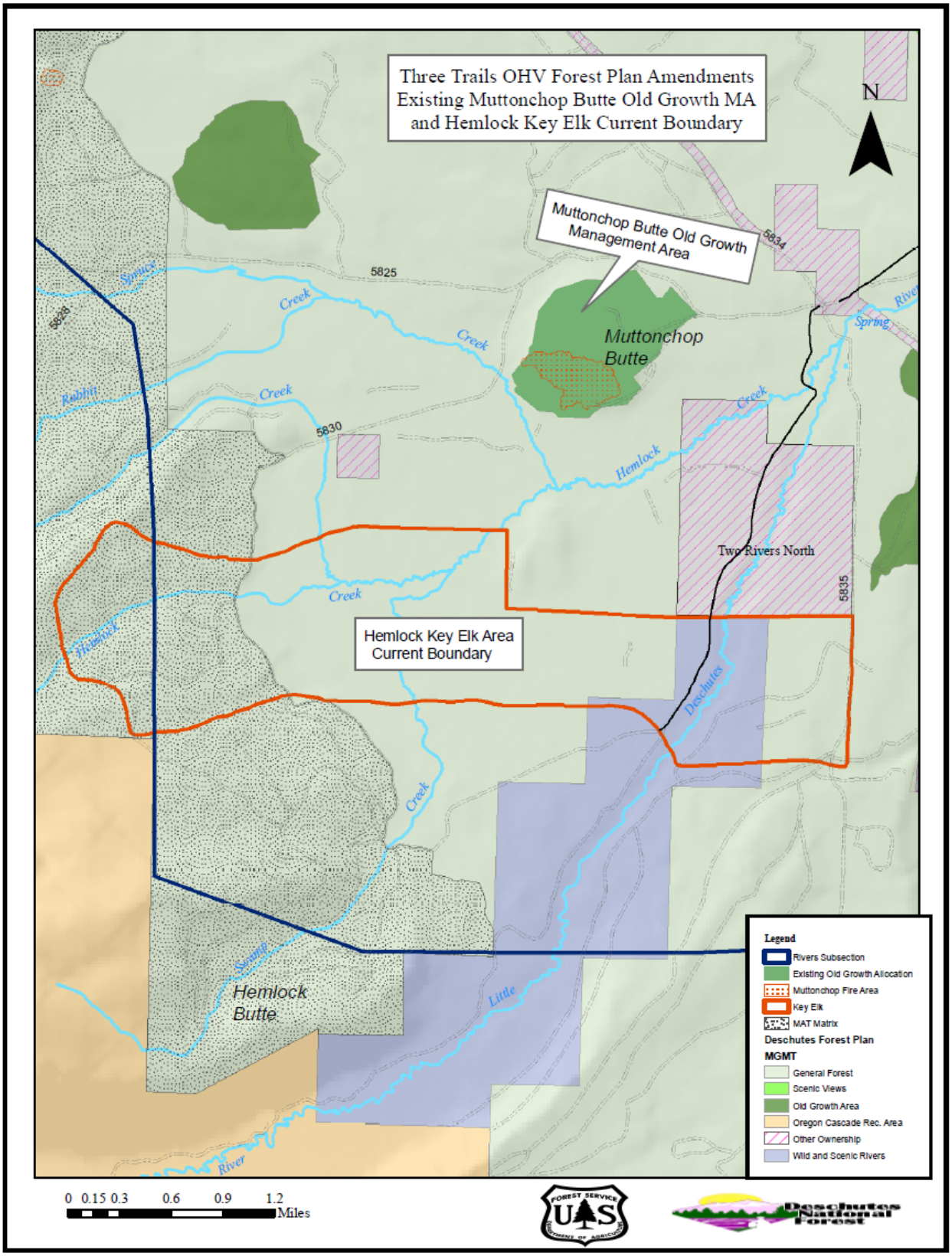



**Figure 36. Existing Conditions for Forest Plan Amendments**

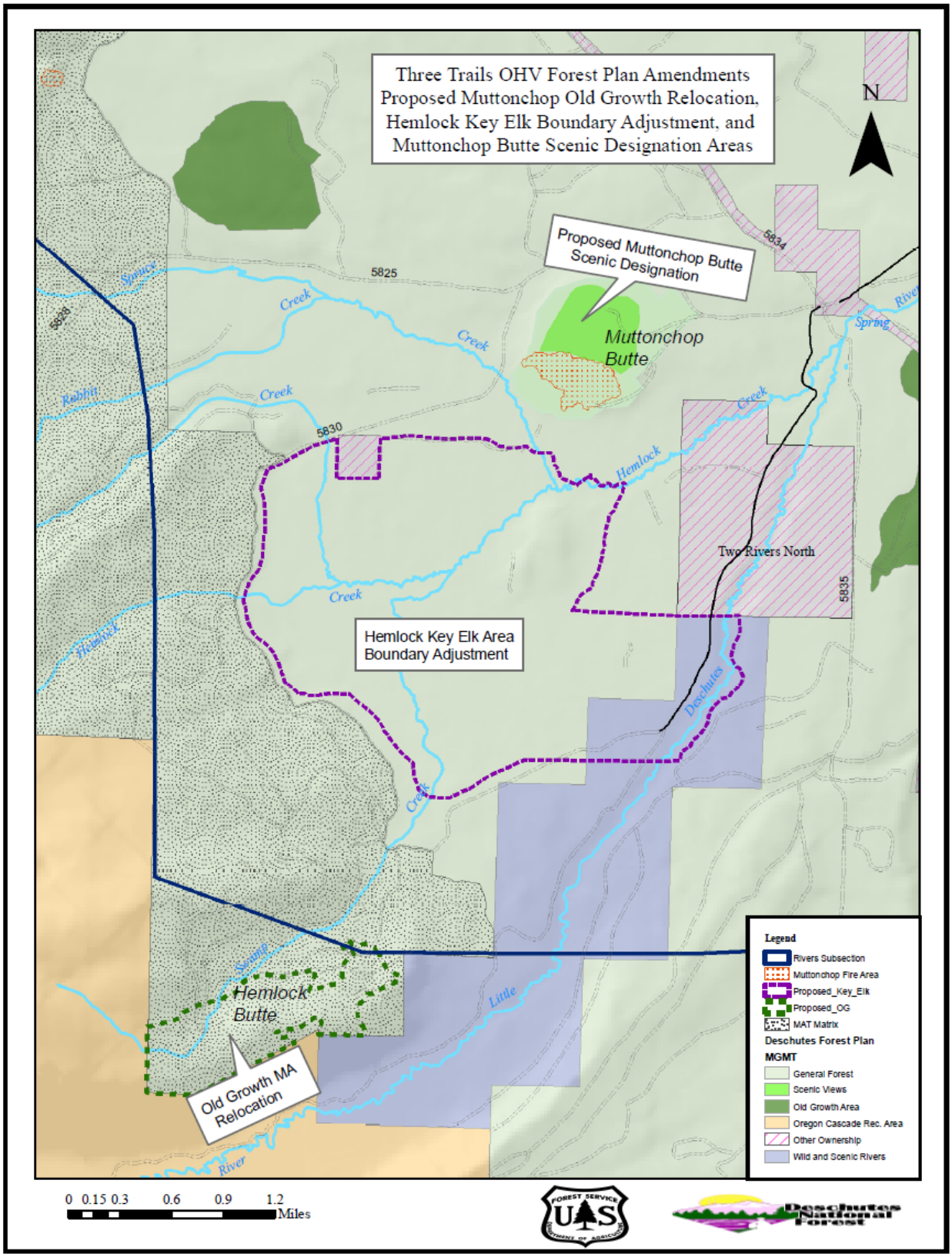



**Figure 37. Proposed Forest Plan Amendment Changes**

## For the Determination of Significance

**Designation of Motorized Recreation within Intensive Recreation Allocation:**

***Timing:*** The Forest Service Planning Handbook (1909.12, 5.32) indicates that a change is less likely to result in a significant plan amendment if the change is likely to take place after the plan period (the first decade). These two plan amendments would take place in the 21st year of the Forest Plan, would take place immediately and is specific to this project.

***Location and size:*** The two proposed amendments are within the Junction Sno-Park and adjacent lands (approximately 345 acres) surrounding the Crescent Lake Landing Strip (T23S, R6, S36 and T24S, R6, S1). This is very small in contrast to 1.6 million acres of the Deschutes National Forest.

***Goals, Objectives and Outputs:*** The proposed change to motorized recreation within the Intensive Recreation Allocation to allow OHV use in areas where recreation use is concentrated. Although the current use is for winter recreation, the change to include the designated trail system for summer use would not alter the long-term relationship between levels of goods and services projected by the Land and Resource Management Plan.

***Management Prescriptions:*** The proposed change to motorized recreation within the Intensive Recreation Allocation standards and guidelines would not change the desired future condition for land and resources from that contemplated by the existing management direction in the Land and Resource Management Plan in the short-term. It only encourages a very small segment of motorized use where it is currently allowed for recreation, among other purposes.

## Muttonchop Butte Old Growth Management Area Relocation

***Timing:*** The Forest Service Planning Handbook (1909.12, 5.32) indicates that a change is less likely to result in a significant plan amendment if the change is likely to take place after the plan period (the first decade). This plan amendment would take place in the 21st year of the Forest Plan, would take place immediately and is specific to this project.

***Location and size:*** The amendment is for the 361 acre Old Growth management area located on Muttonchop Butte to be relocated on 361 acres near Hemlock Butte.

***Goals, Objectives and Outputs:*** The proposed relocation of the 361 acres of Old Growth management area would be consistent with the goals and objectives for Old Growth management by better serving focal species (goshawk and marten). The relocation would provide a larger block of mixed conifer habitat with less fragmentation and more solitude. The current Muttonchop Butte Old Growth area serves as a very busy play area in a mineral pit traversed by trails, plus adjacency to a busy subdivision (Two Rivers North).

The remaining portion of the Muttonchop Butte, equal and above 5,000 feet in elevation, would be allocated to Scenic Views, Partial Retention (background). This would not alter the long-term relationship between goods and services projected by the by the Land and Resource Management Plan. This is because the Old Growth area would replace matrix lands (General Forest Management Area) and Muttonchop Butte would revert to General Forest and Scenic Views with the same acres. Both Management Areas allow programmable timber harvest to occur. There would not be any change in timber outputs over what might be available if the project was designed without the proposed amendment.

***Management Prescriptions:*** The proposed revised Old Growth management and Scenic Views standards and guidelines would not change the desired future condition for the land and resources from that contemplated by the existing management direction in the Land and Resource Management Plan in the short-term. It would only have a net change of 80 acres on the top of Muttonchop Butte as it changes to a

scenery allocation (Partial Retention). The remaining 281 acres of General Forest and 361 acres of National Forest System lands within the Old Growth Management allocation would not change.

### Hemlock Key Elk Area Boundary Modification

***Timing:*** The Forest Service Planning Handbook (1909.12, 5.32) indicates that a change is less likely to result in a significant plan amendment if the change is likely to take place after the plan period (the first decade). This plan amendment would take place in the 21st year of the Forest Plan, would take place immediately and is specific to this project.

***Location and size:*** The proposed amendment would modify the boundary of the Hemlock Key Elk area to include better habitat in the form of stringer meadows, more solitude, and less road density which are important for calving and foraging. The total amount of acres contained within the Key Elk area would remain the same at 2,511.

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***Goals, Objectives and Output:*** The proposed revised Key Elk boundary would not alter the long-term relationship between levels of goods and services projected by the Land and Resource Management Plan, Appendix 16. This amendment would not change management allocations where programmable timber harvest could occur. There would not be any change in timber outputs over what might be available if the project was designed without the proposed amendment.

***Management Prescriptions:*** The proposed revised Key Elk area would not change management prescriptions. The area would stay 2/3rds General Forest under the Land and Resource Management Plan and1/3rd Riparian Reserves under the Northwest Forest Plan. These would not change the desired future condition for land and resources from that contemplated by the existing management direction in the Land and Resource Management Plan.

## 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).

The Multiple Use- Sustained Yield Act of 1960 requires the Forest Service to manage National Forest System lands for multiple uses (including timber, recreation, fish and wildlife, range, and watershed). All renewable resources are to be managed in such a way that they are there for future generations. 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 A) and as modified by Alternatives B through E.

Alternative A would allow the most motorized OHV access and thus the highest level short-term uses of natural and depletable forest resources of the five alternatives considered in detail. It would also result in the greatest potential effect to long-term productivity by dedicating the most area to a non-vegetative condition with least consideration of resources, such as water. The relationship between uses and long-term productivity as it relates to OHV use and resources such as aquatics, botanical, and wildlife is disclosed primarily in Chapter 3 as it describes effects of OHV routes on those resources.

## Unavoidable Adverse Effects

Beneficial and adverse effects on the human environment that might result from implementation of the Action Alternatives, which are 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).

Several adverse effects, including some that are minimal and/or short term were identified during the analysis. Adverse effects are associated with all alternatives, including the No Action and the Action Alternatives. Resource protection measures or mitigations were identified for each adverse effect associated with an Action Alternative as a means to lessen or eliminate such effects on specific resources. See the section titles "Resource Protection Measures" in Chapter 2 of this EIS. Resource areas determined to have potential adverse effects (resulting for any of the alternatives- including the No Action and the Action Alternatives) are documented within the appropriate Environmental Consequences section of each resource in Chapter 3.

***Wildlife***

Reference discussions in Chapter 3 under "Wildlife" for disclosure of effects for Threatened and Endangered species, Management Indicator Species, Regional Forester Sensitive species, Birds of Conservation Concern, Rare and Uncommon, and Big Game. Specifically, the designation of a motorized trail system could potentially alter the effectiveness of mule deer and elk summer range, calving/fawning areas, and migration corridors. The disclosures of those effects are found in the Big Game section of Chapter 3.

***Special Concern Plants***

Matsutake mushrooms are very prevalent in parts of the designated riding area. Soil disturbance and /or compaction could possibly reduce active mycorrhizal connections on the designated trails. There is also the possibility that reducing the canopy cover when the trails are created could play a role in reducing the active mycorrhizal connections. Trails would be laid out and constructed utilizing Project Design Features (Chapter 2) and the operational maintenance section (in this Chapter) to minimize OHV impacts to the known mushroom production areas within the Three Trails OHV project area.

***Invasive Species Plants***

Invasive plants sources come from existing sources already within the Three Trails OHV project area and outside of the National Forest, and cannot, therefore, be completely mitigated with any action confined to Forest Service authority. Project Design Features designed to reduce the introduction and spread of invasive weeds either within or into the Three Trails OHV project area are listed in Chapter 2

***Wild and Scenic Rivers***

Alternative C has a provision for a Little Deschutes River crossing to the southeast of Two Rivers North subdivision. There maybe some short-term negative effects when a user-created crossing is removed but subsequent rehabilitation would improve riparian and stream quality and increase the level of scenic integrity. (Refer to Aquatics and Recreation sections in this Chapter).

***Cultural Resources***

Some trails adopted into the system traverse eligible sites for the National Register. Some artifacts can be damaged or lost. Measures are in place to recover data, protect, or further avoid loss of site integrity.

## 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 development and use of trails and staging areas for OHV use is considered irretrievable commitment of land to a non-vegetative state until such time that the trail system is abandon and the disturbed sites are returned back to productive capacity.

The proposed actions would designate some mineral material sources (play pits) 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 is primarily for mineral material sources, and is secondarily being made available for motorized use with this decision.

## 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)

Current estimates of OHV users is reliable using anecdotal data from riders themselves, agency and law enforcement personnel, resort owners and counting motor vehicles carrying OHV units at known parking areas where the user-created trails are located. Assumptions on number of riders over time on the Three Trails OHV system is based on the number of riders using the area now, State of Oregon data, and anecdotal information from a similar adjacent designated trail system on the Willamette National Forest. What is not known is how implementation of the Travel Management Rule would affect the origin of riders in the area. Although there are no designated motorized trails on the Crescent Ranger District, there are several in central Oregon and on surrounding National Forests. The mode of access to the Three Trails OHV system, whether riders travel from other areas in an automobile, by connecting routes between forests, or locally is unknown.

What is also not known, is whether the overall amount of OHV use locally or regionally 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.

The Forest's gravel and native surface road system connects to lands administered by the Bureau of Land Management along the western boundary of the Forest and the newly acquired State Forest lands. The number of connected miles open to OHVs on other ownership in this vicinity is considerable, but not known precisely. The exact number of miles of connected roads would not affect the conclusions made in this analysis.

OHV motorized access opportunities in the Three Trails OHV project area, 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

Managing for motor vehicle uses on the on the Deschutes National Forest and promoting recreation use in general, under all the Action 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 Three Trails OHV project area is considered the affected environment. However, it is also regional in scope as the numbers of vehicles that drive on state and local highways pass through the project area and the encompassing Deschutes National Forest as they travel to other destinations, commute, or vacation in the region. Vehicles drive here to access sites or drive on Forest Roads to access recreation opportunities. There are motor vehicles (OHVs, motorcycles, RVs, SUVs, etc.) that also use the Forest Roads, trails, and areas.

The Deschutes National Forest and the other national forests and public lands in the area attract many visitors every year and almost all use a motor vehicle. The amount of energy use associated with this travel has increased. Likewise, the numbers of highway vehicles and recreational motor vehicles that use the forest have been increasing, although there is no quantifiable estimate of the numbers of these vehicles. Energy-consuming activities directly or indirectly connected with recreational use of the Three Trails OHV project area include: motor vehicle traffic to access forest staging areas, scenic viewpoints, drive for pleasure on Forest Roads, and recreational motor vehicle use within the planning area in the Deschutes National Forest. It would also include the additional consumption of fossil fuels and human labor that would be expended for the use of vehicles transporting the Forest workers, volunteer labor, heavy equipment, chainsaws, and trucks required to build the designated trail system.

The proposed actions in the EIS would include reducing the miles of roads available to all types of motor vehicles and designate a trail system where OHVs can ride. This change is unlikely to affect the energy consumption within the area, whether that use would be displaced to other areas, or with the designation and phasing in of the Three Trails OHV area that riders would remain. Therefore, the effects on energy consumption resulting from these possible changes in use patterns cannot be reasonably predicted. There are no irregular energy requirements involved in implementation of any action alternatives.

## 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.

**Part 212-Travel Management**
**Subpart A- Administration of the Forest Trasnportation System**

*212.5(b) Identification of the Road System*
The responsible official has identified the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest Lands. The Interdiscplinary Team and Responsible Official assessed the project on a route-by-route basis. This document is the roads analysis for the Three Trails OHV project area. Through an interdisciplinary process and numerous public forums with interested and affected citizens, a minimum system was identified that meets applicable statutory and regulatory requirements; as well as reflecting long-term funding expectations. This system was analyzed at the appropriate scale and is reflected in the identified routes and road closures in each alternative that responds to the proposed action and its key issues. An appropriate discussion for each resource identifies the potential adverse and beneficial environmental effects associated with route designation, closure and decommissioning, and maintenance.

**Subpart B- Designation of Roads, Trails, and Areas for Motor Vehicle Use**

*212.55 (a) and (b)Criteria for Designation of Roads, Trails and Areas*
*(1)Damage to soil, watershed, vegetation, and other forest resources*
Chapter 3 of this document displays the effects in detail to specific resources. In summary:

*Soil:* Activities associated with route designation (including new trail construction) and staging areas with have an overall beneficial effect to the soil resource by placing the trail in a more ecologically suitable locations, allowing natural and management-induced processes to lower the overall footprint of detrimental soil conditions within the project area. Additional detrimental soil conditions as a result of creation of new trail to provide the experience the keeps riders on trails, to make logical route connections and to avoid areas of sensitive resources is limited in scope from 60-84 miles dependent upon the alternative selected. This would be offset by the 56-95 miles of user-created trails and parking areas that would restore soil properties to background levels.

*Watershed:* The overall goal of the trail system is to pull motorized access largely away from aquatic resources. All action alternatives would be an improvement over the existing condition for road/trail densities within the riparian reserve by reducing route densities within the riparian reserve areas where they have potential to affect shade, sediment/water delivery and/or riparian vegetation. Eleven to 18 miles of trails within the reserve would be rehabilitated and restored to proper vegetative condition. Because of the lack of proximity of motorized trail development to perennial streams, well drained soils and lack of connectivity to perennial streams, the action alternatives would have no effect to fisheries or their aquatic habitat.

*Vegetation:* Although the analysis concluded the trail system and road closures may have little effect to vegetation management in the project area, it would potentially increase costs by 25 percent in some circumstances because of the reduction of motor vehicle access for cars and trucks. Also, due to the Project Design Features and the nature of locating new trail construction along areas where forest management has recently occurred, removal of trees would be the exception rather than the standard.

*Cultural Resources:* Following guidelines in a 2003 Regional Programmatic Agreement (PA) among USDA-Forest Service, the Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Office (SHPO), a finding of "*No Adverse Effect*" (No Historic Properties Affected) was determined under Stipulation III (B)5 of the Programmatic Agreement. The Forest finds that there are historic properties but the undertaking would have no adverse effect on them as defined by 36 CFR 800.16(i). Any information potential that would otherwise be lost would be documented and reported to the SHPO. This finding is based on Project Design Features and mitigation measures that have been incorporated to determine the eligibility of unevaluated sites prior to trail construction. This would be accomplished through a series of treatment, data collection, and trail rehabilitation measures to document potentially character defining features of the site. For those sites that may be eligible and are already being traversed from user-created trails through or adjacent to the site, Mitigation Measures would include site protection of the remaining portion adjacent to the route, data recovery, and/or avoidance. For those sites that are evaluated and are not found eligible, they do not require protection.

*(2)Harassment of Wildlife and significant disruption of wildlife habitats:* Chapter 3 discloses the effects of motorized use on wildlife and their individual habitats. Key Issue #2 specifically responds to the designation of a motorized trail system that could potentially alter effectiveness of mule deer and elk summer range, calving/fawning areas, and migration corridors.

*(3) Conflicts between motor vehicle use and existing or proposed recreational uses of the National Forest System lands or neighboring Federal Lands:* There is no documented evidence of conflicts between

motor vehicle uses and other recreational uses on the Crescent Ranger District. The assumption is that the Ranger District is not as visited as nearby Ranger Districts, thereby there is ample room for most activities. Designation of a motorized trail system would further separate uses and provide areas for quiet recreation. Reference Chapter 3 for a discussion on the types of uses that occur on the Ranger District and how they are affected by this project.

(4) *Conflict among different classes of motor vehicle uses on National Forest System lands or neighboring Federal lands:* There is no documented evidence of conflicts among different classes of motor vehicles within the project area or neighboring areas. The Three Trails OHV Project would offer opportunities for all three classes of vehicles (ATVs, Jeeps and 4-Wheel Drive vehicles, Motorcycles).

*(5) Compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factor*s: A Key Issue and one alternative was developed to address what some commenters who live adjacent to the project area believe is an annoyance from sound. One alternative closes a very popular play area in a mineral pit (Muttonchop) adjacent to the Two Rivers North Subdivision. Two alternatives move the closest trails away from residences, and all alternatives close and rehabilitate numerous redundant and unnecessary user-created trails that radiate out of populated areas as part of their design. A site-specific study was conducted to determine acres and percent of private land with residences from which sounds of OHVs might be audible. Also, Project Design Features were used to limit sound to specific hours in the Muttonchop Pit, as well as retaining vegetation that can dampen noise. In the Air Quality analysis, emissions from motor vehicles are disclosed. They tend to be localized and most apparent at staging areas, which are located away from populated areas.

*Public Safety:* The analysis disclosed fugitive dust as a potential to affect health, although it would be localized and temporary. Trail construction would be engineered for curvilinear design to abate driver speed. Barriers, signs, and other trail delineators would be employed to reduce rider confusion. In addition, an undercrossing for Highway 97 would provide a link the Rivers and Walker segments dependent upon funding. Increased use of the low-speed native-surfaced shared use routes (which would include some four-digit collector roads such as 5834 and portions of 9451 and 9753) would primarily result in an increased need for monitoring those routes to identify and address issues related to user safety and resource protection, although such a need would be necessary on roughly half the miles of road as would be required in Alternative C. These roads are managed as low standard roads intended for high clearance vehicles with no consideration for user speed or convenience.

*Provision of Recreational Opportunities:* As a result of implementation of the Travel Management Rule, this project develops a trail system and staging areas specifically for OHV enthusiasts and to provide a riding experience they have requested. This proposal would provide over 100 miles of interlinking trails that would vary in skill level and density to match the terrain and to provide an opportunity for beginner through advanced. The analysis also discloses the balance of motorized and non-motorized recreational opportunities, including the potential affect of noise on quiet recreation such as hiking in wilderness and nearby OCRA. Designation of a motorized trail system benefits the non-motorized user as it effectively separates uses.

*Access Needs:* As part of the interdisciplinary process, access to private lands was maintained and the representative of the largest adjacent landowner weighed in on the process. Road closures were well coordinated to provide fire suppression access and other administrative endeavors such as future vegetative management.

Section 504 of the Rehabilitation Act of 1973 says that no qualified individual 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. In conformance with section 504, wheelchairs or mobility devices are welcome on all NFS lands that are open to foot travel and they are specifically exempted from definition as a motor vehicle in section 212.1 of Travel Management Rule (36CFR 212.1). There is no legal requirement to allow persons 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. This concern has already been decided by law.

*Conflicts among Uses of National Forest System Lands:* Chapter 3 of the EIS has a robust display of the tradeoffs associated with designation of a motorized trail system. For each resource area, there are potential conflicts as it is the nature of multiple use in the National Forest system. Key Issues drove alternatives to address the most notable conflicts. These issues include motorized use and its affect on big game habitat effectiveness, annoying noise to an adjacent community, and incompatibility between equestrians and OHV riders. For other conflicts among uses such as potential incursion into adjacent sensitive plant populations, cultural sites eligible for the National Register, or wet areas, structures were designed into the alternatives to restrict movement off of a trail system.

*The Need for Maintenance and Administration of Roads, Trails, and Areas that would arise if the Uses under Consideration are designated; and The Availability of Resources for that Maintenance and Administration:* The analysis includes a Safety, Education, Enforcement, Maintenance, and Monitoring Plan that has been successfully used throughout central Oregon on many other designated trail systems. The mission of COHVOPS is to provide consistent, quality off-highway vehicle recreation opportunities that are focused on customer service and resource protection. COHVOPS manages the central Oregon OHV trail systems for the Deschutes and Ochoco National Forests and the Prineville BLM. The team implements existing OHV management plans, identifies future needs, recommends actions to management, and assists in future OHV planning efforts. COHVOPS is funded through a combination of direct support from the Forest Service, the BLM, and grant funding from the State of Oregon derived from the ATV Allocation Funds derived from the ATV Permit program and a portion of gas tax revenue.

*212.55(c) Specific Criteria for Designation of Roads*
*(1) Speed, volume and composition on roads; and (2) Compatibility of vehicle class with road geometry and road surfacing:* As part of implementation of the Travel Management Rule on the Deschutes National Forest, motorized mixed use analysis has been performed to establish the suitability of allowing motorized mixed use on roads in the context of their current setting in terms of alignment, width, typical user speed, and presence or absence of traffic control devices. Supplemental analysis would be performed on certain designated motorized mixed-use roads in the Analysis Area that have been determined to be unsuitable for a mixture of non-highway legal and highway-legal vehicles because of either their current setting or their designation as roads maintained for passenger car use (on which non-highway-legal vehicle use is prohibited). In particular, this supplemental Engineering Analysis would be performed on portions of Roads 5825, 5830, and 6020 to determine what mitigations would be necessary to reduce the crash probability and severity on these motorized mixed use roads to an acceptable level. It was disclosed that designation of routes would lead to additional monitoring and maintenance on some shared use roads. A Project Design Feature is included that post all shared use routes within the Three Trails OHV Project area with confirmation signing for the presence of OHVs.

No valid existing rights would be affected by the action alternatives. There has been no change or designation of motorized use in wilderness or primitive areas per CFR 212.6(b).

**National 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. The regulations in this subpart set forth a process for developing, adopting,

and revising land and resource management plans for the national Forest System as required by the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended (hereafter, RPA). These regulations prescribe how land and resource management planning is conducted on national Forest System lands. The resulting plans shall provide for multiple use and sustained yield of goods and services from the national Forest System in a way that maximizes the long-term net public benefits in an environmentally sound manner.

The Three Trails OHV project followed the 1982 planning rule in the Three Trails OHV project and specificially in the proposed amendment of the Deschutes National Forest Land and Resource Management Plan.

## Forest Plan Consistency- Deschutes National Forest

**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 would prepare and periodically update a Forest Travel Plan which would identify areas, roads, and trails which are open or closed." (Deschutes National Forest Land and Resource Management Plan (LRMP) p. 4-33, TR-8).

The Motor Vehicle Use Map (MVUM) published after the release of the Record of Decision for the Travel Management Rule would function as the new Travel Map for the Deschutes National Forests. Separate trail system maps would be published after the Record of Decision has been signed for the Three Trails OHV project.

### 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.

The purposes of this Act are to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered and threatened species, and to take such steps as may be appropriate to achieve the purpose of the treaties and conventions set forth in subsection (a) of this section." The Act also states "It is further declared to be the policy of Congress that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act."

Alternatives B, C, D, and E would reduce the overall amount of open roads and motorized OHV use would be confined to a designated trail system. Alternatives B, C, D and E would result in a determination of **"May Effect, Not Likely to Adversely Affect"** the northern spotted owl and northern spotted owl critical habitat. Alternatives B, C, D, and E would have **"No Impact"** on the Oregon spotted frog. Alternatives B, C, D, and E would result in a determination of **"Beneficial Impact"** for the Pacific fisher.

### 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.

Action alternatives follow State of Oregon requirements in accordance with the Clean Water Act for protection of waters. Application of Best Management Practices (BMPs) are selected and designed on site-specific conditions for waters potentially affected in the Three Trails OHV analysis area. The interdisciplinary team has reviewed and incorporated applicable BMP water quality objectives in the design of alternatives and their mitigation measures. Standards and Guidelines for the Northwest Forest Plan (Aquatic Conservation Strategy) and the Inland Native Fish Strategy where developed (in part) to maintain and restore aquatic ecosystems for dependent species (Chapter 3, Fisheries and Water Quality). These standards and guidelines afford the same or greater protection of stream courses as direction found in the 1988 USDA publication *General Water Quality – Best Management Practices*.

Under Section 319 of the 1987 Clean Water Act Amendments, states are required to determine those waters that would 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.

The Little Deschutes River is listed on the Oregon Department of Environmental Quality's (DEQ) 2002 303(d) list as "Water Quality Limited" for elevated summer stream temperatures from river mile 54 to river mile 78 (http://www.deq.state.or.us/wq/WQLData/SubBasinList02.asp).

Crescent Creek corridor is also listed as water quality limited. None of the action alternatives would affect 303(d) parameters. The 303(d) listing is mainly due to impoundment and flows released from the dam. Water quality standards cannot be met without restoring streamflows. Due to the remote nature of a considerable segment of Crescent Creek, there are very few user-created trails or dispersed camps that have potential to affect these parameters.

All activities within the Three Trails OHV project area would not change the 303(d) parameters for which the Little Deschutes River or Crescent Creek are listed. Reference the Fisheries and Aquatic Resource section for more detail.

## Survey and Manage

Compliance with the *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (Forest Service et al. 2001) ("2001 ROD"). This project complies with the applicable species survey requirements and management provisions in the 2001 ROD; specifically:

- Based on the level of surveys previously conducted, no motorized trails would access areas of permanent surface moisture. Implementation of any Three Trails OHV action alternatives would have **"No Impact"** to the Crater Lake tightcoil snail.

- Great gray owl surveys were conducted in the Three Trails OHV analysis area in 2007 and 2008 with three visits completed each year. There were no detections of the species.

- There are four segments of trail segments that fall within the Northwest Forest Plan area. These sites have been visited and based upon the definition in the 2001 ROD, they are not classified as old growth.

- From the prefield review, the following have known sites within the project area: *Bryoria tortusa, Buxbaumia viridis, Cantharelles subalpinus, Gomphus bonari, Nivatogastrium nubigen, Ramaria rubrievanescens,* and *Rhizopgon truncatus.* These species do not require pre-disturbance surveys, but require management of known sites. In all action alternatives, all known sites would be avoided.

## Executive Orders

### 11644 of February 8, 1972
### Use of Off-road Vehicles on the Public Lands

**Sec. 3.** *Zones of Use.* (a) Each respective agency head shall develop and issue regulations and administrative instructions, within six months of the date of this order, to provide for administrative designation of the specific areas and trails on public lands on which the use of off-road vehicles may be permitted, and areas in which the use of off-road vehicles may not be permitted, and set a date by which such designation of all public lands shall be completed. Those regulations shall direct that the designation of such areas and trails will be based upon the protection of the resources of the public lands, promotion of the safety of all users of those lands, and minimization of conflicts among the various uses of those lands. The regulations shall further require that the designation of such areas and trails shall be in accordance with the following--

(1) Areas and trails shall be located to minimize damage to soil, watershed, vegetation, or other resources of the public lands.

*Chapter 3 of this document displays the effects in detail to these specific resources. Also, see response to the Travel Management Rule CFR 255(a) and (b) in this section.*

(2) Areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats.

*Chapter 3 discloses the effects of motorized use on wildlife and their individual habitats. Key Issue #2 specifically responds to the designation of a motorized trail system that could potentially alter effectiveness of mule deer and elk summer range, calving/fawning areas, and migration corridors. Alternatives D and E respond to this Key Issue.*

(3) Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.

*There is no documented evidence of conflicts between motor vehicle uses and other recreational uses on the Crescent Ranger District. The assumption is that the Ranger District is not as visited as nearby Ranger Districts, thereby there is ample room for most activities. Designation of a motorized trail system would further separate uses and provide areas for quiet recreation. Reference Chapter 3 for a discussion on the types of uses that occur on the Ranger District and how they are affected by this project, including noise. The Three Trails OHV Project would offer opportunities for all three classes of vehicles (ATVs, Jeeps and 4-Wheel Drive vehicles, Motorcycles).*

(4) Areas and trails shall not be located in officially designated Wilderness Areas or Primitive Areas. Areas and trails shall be located in areas of the National Park system, Natural Areas, or National Wildlife Refuges and Game Ranges only if the respective agency head determines that off-road vehicle use in such locations will not adversely affect their natural, aesthetic, or scenic values.

*There are no trails located in Wilderness, Inventoried Roadless, or Potential Wilderness Areas. See the Recreation section in Chapter 3 for more details. Chapter 3 also addresses Scenery.*

(b) The respective agency head shall ensure adequate opportunity for public participation in the promulgation of such regulations and in the designation of areas and trails under this section.
*The public participation process is outlined in Chapter 1 of this document.*

(c) The limitations on off-road vehicle use imposed under this section shall not apply to official use.
*Maintenance Level 1 roads would remain closed to the public; however administrative use is maintained.*

### 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 A, where motorized access would be allowed in areas currently open to cross-country travel and allowed without changed conditions for motorized access for dispersed camping.

**Aquatic Biota:** Alternative A could result in an increase in impacts from motorized access within floodplain areas where floodplain areas are currently open to cross-country travel and where motorized access for dispersed camping is not prohibited. Alternatives B through E would result in a decrease of impacts within floodplain areas through the elimination of cross-country travel. Thus, all alternatives ultimately comply with the intent of Executive Order 11988.

All action alternatives pull motorized access away from riparian resources by reducing miles of trail from 13 down to a range of one to three miles, dependant upon the alternative. It also closes from one to five miles of Maintenance Level 2 roads within riparian resources. Project Design Features were designed to elevate tread or avoid construction altogether if possible. Thus all action alternatives would result in a decrease of impacts within floodplains, wetland, and riparian areas by prohibiting cross-country travel. Thus, all alternatives comply with the intent of Executive Order 11990 and USDA Departmental Regulation 9500-3. See discussions related to this topic in Hydrology, Fisheries, and Soils resource sections in Chapter 3 for more information.

### 13186 of January 10, 2001, and the Migratory Bird Treaty Act
#### The Migratory Bird Treaty Act of 1918

The purpose of this Act is to establish an international framework for the protection and conservation of migratory birds. The Act makes it illegal, unless permitted by regulations, to “pursue, hunt, take, capture, deliver for shipment, ship, cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, including in this Convention…for the protection of migratory birds…or any part, nest, or egg of any such bird” (16USC 703). The original 1918 statute implemented the 1916 Convention between the United States and Great Britain (for Canada). Later amendments implemented treaties between the Unites States and Mexico, Japan, and the Soviet Union (now Russia).

### 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).

The Three Trails OHV project area is not expected to result in any additive effects to the Golden Eagle because they are not known to nest in the project area and habitat is limited.

For the Bald Eagle, because there would be no removal of nest trees or potential nest trees, all motorized routes are greater than ½ mile from the known nests, and that BEMAs would not be entered with new trail construction, the determination is "No Impact" to the bald eagle or their habitat. Because no negative effects are expected, there would also be no cumulative effects with project implementation.

For a more detailed analysis see Wildlife- TES and MIS sections in Chapter 3.

### 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 EIS 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 Three Trails OHV project. These other agencies have been kept abreast of these proposed actions. The Deschutes National Forest currently has in place various cooperative seasonal motorized use closures, including winter range motorized closure areas and the so-called "Green Dot" hunting season road closures. Alternatives C incorporates a seasonal closure period for the spring fawning/calving season on Walker Rim. Alternatives D and E have Project Design Features that limits OHV trails in big game migration corridors.

### 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.

In order to identify and address environmental justice concerns, the EO states that each agency shall analyze the environmental effects, including human health, economic, and social effects of Federal actions, including effects on minority populations, low-income populations, and native Americans as part of the NEPA process.

Two distinct populations fall into the categories identified by EO 12898. One population is the harvesters, most of whom are members of the Asian minority. In Environmental Justice analyses, Census data is often used to illustrate the percentage of the population that belongs to an ethnic minority in the

study area. Data usually comes from sources similar to those presented in the Social and Economic section.

Although most of the matsutake harvesters are members of the Southeast Asia minority, they are not counted in Census data for the study area, because they spend much of the year in places such as Olympia, Richland, and Tacoma, Washington. Others spend their time in Stockton, California. Some come from as far away as Lynn and Wooster, Massachusetts, and Richmond, Virginia. Therefore, quantitative data on the ethnic composition of the harvester community is not available. However, there is strong anecdotal, qualitative data showing that a majority of the harvesters are Southeast Asian.

The other population in the study area that falls into the category identified by EO 12898 is the group of low-income, permanent residents of Klamath County who are mostly White and considered a low-income population. The poverty rate for Klamath County is 2 percent higher than that of the state. Approximately 17 percent of individuals had income that was below the poverty line in 2007. The percentage in Oregon as a whole was 12 percent.

The Three Trails OHV Project and its affect on matsutake production has the potential to affect harvesters from both low income and minority populations. Development of the Three Trails OHV Project has been conducted under Departmental Regulation 5600-2, December 15, 1997, and the Council on Environmental Quality's Environmental Justice – Guidance Under the National Environmental Policy Act. The proposed action, its purpose and need and potential effects have been clearly described, and as mentioned above, scoping under the National Environmental Policy Act employed a variety of approaches to involve citizens, including those identified by the Executive Order, in the planning process. This included on-going consultation with members of the Asian harvester community.

Providing for effective participation requires innovative approaches. Because mushroom harvesters are of several different Asian ethnic and linguistic backgrounds, signs informing harvesters of meetings were posted in several different languages. Field rangers also informed harvesters of meetings. Translators also assisted with communication at the public scoping meetings that were held at the mushroom camp, before and during harvest season, prior to the release of the Three Trails OHV proposed action and again after site specific actions were presented to the public. These translators helped overcome not only the linguistic, but also the cultural and institutional barriers that otherwise may have interfered with their participation in the NEPA process. In addition, public meeting were often held late in the evenings after the harvesters had finished their long days of work. The harvesters indicated areas of high matsutake mushroom potential (based on historical knowledge). This, in addition to botanical surveys, allowed planners to avoid placing trails in the most productive and preferred mushroom harvesting sites. This includes the area west of the 5834 road between Crescent Lake and Two Rivers North subdivision. Also, the trail system was designed to avoid the immediate proximity of the mushroom camp to maintain the social setting and picking areas that are within walking distance of the camp.

Although some potential matsutake mushroom habitat would be affected when new trails are constructed due to compaction which affects fungal mycelia) it would be very small compared to the overall project area. The Three Trails OHV project would have no noticeable change to the overall matsutake harvest.

As a result of 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 Three Trails OHV planning process in order to reveal any such negative effects that may unfairly and inequitably impact beneficiaries regarding program development, administration, and delivery. 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.

The project alternatives, given the size of potential social and economic effects, are not likely to result in civil rights impacts to Forest Service employees or customers of its program.

### Persons with Disabilities

Some comments received during the Three Trails OHV 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 has been conducted to ensure that they apply equally to all groups. Therefore, the Three Trails OHV 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.

### Prime Farmland, Rangeland, and Forest Land

The Secretary of Agriculture issued memorandum 1827 which is intended to protect prime farm lands and rangelands. The Three Trails OHV analysis area does not contain any prime farmlands or rangelands. Prime Forest Land, as defined in the memorandum, is not applicable to lands within the National Forest System.

# Chapter 4. Consultation and Coordination

## Preparers and Contributors

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

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# Distribution of the Environmental Impact Statement

**Environmental Impact Statement**

The Forest Service consulted with or received project comments from individuals, agencies, tribes, and non-Forest Service persons during the development of the Environmental Impact Statement.

**Federal Agencies**

U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

**State Government**

Oregon Department of Fish and Wildlife

**Tribes**

Burns Paiute Tribe
Confederated Tribes of Warm Springs
The Klamath Tribes

**Organizations**

Alliance of Forest Workers and Harvesters
American Hiking Society
Cascadia Timberlands, LLC.
Cascadia Wildlands Project
Central Oregon CombinedOff-Highway Vehicle Operations
Central Oregon Motorcycle and ATV Club
Crescent Gilchrist Community Action Team
Crescent Lake Community Action Team
Deschutes County 4-Wheelers
East Cascades Chapter- Back Country Horsemen
Emerald Trail Riders
G & G Cycle-KMT
Klamath Basin OHV Club
League of Wilderness Defenders- Blue Mountain Biodiversity Project
Northwest Quadriders
Ochoco Trail Riders
Oregon Chapter, Sierra Club
Oregon Equestrian Trails and Back Country Horseman
Oregon Hunters Association
Oregon Motor Cycle Riders Association
Oregon Natural Desert Association
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The following requested to receive a copy (hardcopy or CDROM) of the Environmental Impact Statement.

**Federal Agencies**
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

**State Government**
Oregon Department of Fish and Wildlife

**Tribes**
Burns Paiute Tribe
Confederated Tribes of Warm Springs
The Klamath Tribes

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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 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 would provide flow of information that may indicate the need to change a curse of action. Scientific findings and the needs of society may also indicate the need to adapt resource management to the new information.

**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 vehicles for national defense purposes; Law enforcement response to violations of the 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).

**Advanced Regeneration** - Small trees, usually less than one inch in diameter, that are growing under mature trees prior to planned harvest activities.

**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 designated 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 ATV trail is often used to discuss a motorized trail that can be used for motorcycles also.

*Class I ATV (quads, 3-wheelers)*

- Vehicles 50-inch wide or less and,
- Dry weight of 800 pounds or less
- Has a saddle or seat
- Travels on 3 or more tires

*Class II ATV (jeeps, sand rails, SUVs, etc)*

- Vehicles wider than 50 inches and
- Dry weight more than 800 pounds

*Class III ATV (motorcycles)*

- Vehicles on two tires
- Dry weight less than 600 pounds

The Forest Service does not classify as ATV's the new 'golf cart' sized light off-road utility vehicles as they usually have a wider track and overall length than ATV's.

**Alternative**- One of several policies, plans or projects proposed for the decision-making.

**Aquatic Ecosystem-**The stream channel, lake or estuary bed, water, biotic communities and the habitat features that occur within.

**Archaeological**- A term used to describe any cultural resources deposited on or in soil strata from past human activities. 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).

**Bald Eagle Management Areas (BEMAs)-** Areas managed under the Deschutes National Forest land and Resource Management Plan for protection of the threatened northern bald eagle. BEMAs provide nesting and roosting habitat for the species.

**Best Management Practices (BMP)**- Practices designed to prevent or reduce water pollution. Also referred to as Soil and Water Conservation Practices (SWCPs).

**Big Game**- Those species of large mammals normally managed for sport hunting.

**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.

**Biota-** The plant and animal life of a particular region.

**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.\

**Canopy**- the upper most spreading branchy layer of a forest.

**Canopy Base Height**- The height above the ground of the first canopy layer where the density of the crown mass within the layer is high enough to support vertical movement of a fire. Low canopy base heights have been shown to initiate crown fire behavior.

**Capability**- The potential of an area of land to produce resources, supply goods and services and to allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends on 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.

**Chain**- A standard measurement for rate of fire spread (approximately 66')

**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 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 Roads**- 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 Maintenance Level I road.

**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).

**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.

**Concentrated Use –** The Forest Plan page 4-135 under Intensive Recreation defines concentrated use as: "Generally, high concentrations of visitors will occur around developments."

**Condition Classes**- A function of the degree of departure from historical fire regimes. Condition Class I is within or near historical conditions; Class III is significantly altered from historical regimes.

**Connectivity (of habitats)-** The linkage of similar but separated vegetation stands by patches, corridors or 'stepping stone' of like vegetation. This term can also refer to the degree to which similar habitats are linked.

**Corridor-** Elements of the landscape that connect similar areas. Streamside vegetation may create a corridor of willows and hardwoods between meadows where wildlife feed.

**Council of Environmental Quality (CEQ)-** The Council issues regulations binding all federal agencies, to implement the procedural provisions of the national Environmental Quality Act (NEPA). The regulations address the administration of the NEPA process, including the 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.

**Cross-country Travel**- Travel over terrain not on designated roads and/or trails.

**Cryic**- Soils in this temperature regime have a mean annual temperature higher than 0°C but lower than 8°C.

**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.

**Cumulative Effects or Impacts-** The impact on the environment that results from 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 individual minor but collectively significant actions taking place over a period of time.

**Draft Environmental Impact Statement (DEIS) -** 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.

**Desirable species**- Any species of plant or animal which is considered to be compatible with meeting management goals and objectives.

**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. The Forest Plan on page G-4 defines developed recreation: "Recreation use that occurs within a site or facility specifically established and constructed for public recreation purposes. Activities commonly included are camping, picnicking, resort use, downhill skiing, but also include parking areas, trailheads, boat launching sites, etc.

**Difficulty Level** - The degree of challenge a trail presents to an average user's physical ability and skill, based on trail condition and route location factors such as alignment, steepness of grades, gain and loss of elevation, and amount and kind of natural barriers that must be crossed, and which may temporarily change due to weather. (FSM 2353.05):

a. Easiest. A trail requiring limited physical ability and skill to travel.

b. More Difficult. A trail requiring some physical ability and skill to travel.

c. Most Difficult. A trail requiring a high degree of physical ability and skill to travel.

**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 underdeveloped, so long as they meet the general posted rules for site protection. The term dispersed recreation usually implies lower visitor use densities. Dispersed recreation may be motorized or non-motorized and that is defined in the Forest Plan on page 4-4: "Activities which disperse recreation throughout the forest include Nordic skiing, river rafting, mountain bicycling, and off-highwau use." Page G-4 of the Forest Plan defines dispersed recreation as "Recreation use outside of developed recreation site, ranging from scenic driving to backpacking."

**Disturbance**- Events that such as a forest fire or insect infestation that alters stand structure composition or function of an ecosystem.

**Diurnal** – Active during the daytime, resting at night.

**Dual Sport**-Class III (motorcycle) ATV specificially designed to be street legal and used off road.

**Early Seral**- Plants which inhabit a disturbed site within the first few years subsequent to the disturbance.

**Ecosystem**- An arrangement of living and nonliving 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.

**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.

**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 office that an emergency exists.

**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 plant or animal species.

**Engineering Analysis-** An analysis and evaluation conducted by a qualified engineer or under the supervision of a qualified engineer of a NFS road, road segment or road being considered for mixed motorized use. The analysis and evaluation may include recommended mitigation measures. The analysis may simply be simply documentation of engineering judgment or maybe a more complex engineering report that includes many factors related to mixed motorized use.

**Environmental Analysis**- An analysis of alternative actions and their predictable long and short-term effects. Environmental analysis include physical, biological, social and economic factors.

**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) of 1969 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 for Environmental Quality (CEQ) guidelines and directives of the agency responsible for the project proposal.

**Extended Attack**- When a fire has not been contained by the initial attack resources dispatched to the fire, would not have been contained within the management objectives that are established for that zone or area, and have not been contained within the first operational period.

**Extirpated**- Local extinction.

**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.
**Fugitive Dust-** Dust generated from open sources is termed 'fugitive' because it is not discharged to the atmosphere in a confined flow stream.

**Fire Management-** All activities required for the protection of resources from fire and the use of fire to meet land management goals and objectives.

**Fire regime**- A function of the historical frequency of fire and the degree of severity of those fires.

**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.

**Forb**- A broadleaf plant that has little or no woody material in it.

**Forest Road or Trail-** A road or trail wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.

**Forest Supervisor**- The official responsible for administering National Forest lands on an administrative unit, usually consisting of one or more Ranger Districts which comprise the National Forest. The Forest Supervisor reports to the Regional Forester.

**Fuels**- Vegetative matter, dead or alive, that burns in a fire. It is broadly categorized by the following categories:

- Surface or ground fuels are within a foot of the ground.
- Ladder fuels exist when you have a continuous vertical arrangement of fuel that easily allows fire to go from ground level into the tree canopy.
- Crown fuels are the tree limbs and leaves that can burn with enough heat and/or wind.
- Live fuels are the green (live) herbs and shrubs.

**Fuel Models-** Fuel models are a tool used to standardize discussion of fuel conditions on a landscape. Fuel conditions, defined by quantity and arrangement, have been categorized into 40 standard descriptive fuel models (Scott and Burgan 2005).

**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, pruning, chipping, crushing, mastication, piling and burning).

**Game Species-** Any species of wildlife or fish that is harvested according to prescribed limits and seasons.

**Geographical Information Systems (GIS)-** GIS is a computer technology that uses a geographic information system as an analytic framework for managing and integrating date, solving a problem or understanding a past, present or future situation. (http://www.gis.com/whatisgis/index.html, 2006)

**Habitat-** The area where a plant or animal lives and grows under natural conditions.

**Habitat Capacity**- The ability of a land area or plant community to support a given species of wildlife.

**Hiding Cover-** The vegetation that would 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 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. Usually greater clearance than a standard passenger vehicle.

**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 operating licensing.

**Historic Property**- Any prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion in, the National Register for 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 for Historic Places criteria.

**Hydric Soils**- Soils indicative of wetland area, 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.

**Hydrology**- The science of 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.

**Hypolimnion-** is the dense, bottom layer of water in a thermally-stratified lake. It is the layer that lies below the thermocline. Typically the hypolimnion is the coldest layer of a lake in summer, and the warmest layer during winter. Being at depth, it is isolated from surface wind-mixing during summer, and usually receives insufficient irradiance (light) for photosynthesis to occur.

**Hyporheic**- is a region beneath and lateral to a streambed, where there is mixing of shallow groundwater and surface water. The flow dynamics and behavior in this zone (termed **hyporheic flow**) is recognized to be important for surface water/groundwater interactions, as well as fish spawning, among other processes.

**Hypoxic**- reduced dissolved oxygen content of a body of water detrimental to aerobic organisms

**Initial Attack**- The fire suppression effort that takes place as soon as possible following a wildland fire report.

**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 received 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.

**Inventories Roadless Area**- (West of the 100$^{th}$ meridian). An area which meets the statutory definition of wilderness, does not contain improved roads maintained for travel by standard passenger type vehicle and meets one or more of the following criteria:

1. Contains 5,000 acres or more
2. Contains less than 5,000 acres but:
    a. Due to physiography or vegetation, is manageable in a natural condition
    b. Is a self-contained ecosystem such as an island
    c. 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 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 I changed, the timber production can be resumed. The production lost is irretrievable, but the action is not irreversible.

**Irreversible-** Applies primarily to the use of non-renewable 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 Assessment (EA) or Environmental Impact Statement (EIS).

**Ladder Fuels** - Fuels that provide vertical continuity between the ground fuels and tree crowns, thus creating a pathway for the surface fire to move into the overstory tree crowns.

**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 or 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 estimate general population trends.

**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 times they are closed to vehicular traffic. The closure period must exceed one year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and 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 maintenance 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 maybe open and suitable for non-motorized uses.

**Maintenance Level 2-** Assigned to roads open for se 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 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 maybe employed for certain class 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 surface. However, some roads maybe single lane. Some roads maybe paved and/or dust abated. The most appropriate traffic management strategy is 'encourage'. However, 'prohibit' strategy may be 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 maybe aggregate surfaced and dust abated. The most appropriate traffic management strategy is 'encourage'.

**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.

**Mitigation Measures-** Modifications of actions taken to:

1. Avoid impacts by not taking a certain action or parts of an action,
2. Minimize impacts by limiting the degree or magnitude of the action and its implementation;
3. Rectify impacts by repairing, rehabilitating or restoring the affected environment;
4. Reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or,
5. Compensate for impacts by replacing or providing substitute resources or environments.

**Mixed Use –** Roads on which both highway legal and non-highway legal vehicles are operating.

**Monitoring**- A process of collecting information to evaluate if objectives and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.

**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 batter-powered, that is designed solely for use by a mobility-impaired person for locomotion, and that is suitable for use in an indoor pedestrian area.

**Motor vehicle use map (MVUM)-** A map reflecting designated roads, trails, and areas on an administrative unit or a Ranger District of the National Forest System.

**Motorized Mixed Use**- Designation of a national Forest System (NFS) road for use by both highway-legal and non-highway legal motor vehicles (FSM Engineering 7700-30).

**Motorized Trail**-A route over 50 inches in width or a route over 50 inches wide that is identified and managed as a trail.

**National Environmental Policy Act (NEPA)-** An Act passed in 1969 to declare a national policy that encourages productive and enjoyable harmony between humankind and the environment, promotes efforts that prevent or eliminate damage to the environment and biosphere, stimulates the health and welfare of humanity, enriches the understanding of the ecological systems and natural resources important to the nation, establishes a Council on Environmental Quality.

**National Forest Management Act**- A law passed in 1976as an amendment to the Forest and Rangeland Renewable Resources Planning Act, requiring preparation of Forest Plans and the preparation of regulations to guide that development.

**National Forest System-** All National Forest land reserved or withdrawn from the public domain of the U.S.; all National Forest lands acquired through purchase, exchange, donation or other means; the national Grasslands and land utilization projects administered under Title III of the Bankhead-Jones Farm Tenant Act; and all other lands. Waters, interests therein that are administered by the Forest Service or are designated for administration though the Forest Service as part of the system (36 CFR 212.1).

**National Forest System Road-** A forest road other than a road which has been authorized by a legally documented right-of-way held by State, county or other local public road authority.

**National Historic Preservation Act**- Legislation intended to preserve historical and archaeological sites in the United States of America. Signed into law October 15, 1966.

**National Survey on Recreation and the Environment (NSRE) -** Part of the National Recreation Survey (NRS) program that was started in 1960

**National Forest Visitor Use Monitoring (NUVM) -** A permanent, ongoing sampling system which measures national forest visitor demographics, experiences, preferences and impressions. A stratified random sample is done for 25% of the national Forest system each year according to a national research protocol. NVUM responds to the need to better understand the use and importance, satisfaction with, national forest recreation opportunities.

**National Register of Historic Places**- A register of districts, sites, buildings, structures and objects significant in American history, architecture, archaeology and culture. The register was established by the National Historic Preservation Act of 1966 and is maintained by the Secretary of the Interior.

**Native Species**- With respect to a particular ecosystem, a species that other than as a result of introduction, historically occurred or currently occurs in that ecosystem (Executive Order 13122, 2/3/99).

**Non-Motorized Travel**- Modes of travel include hiking, equestrian and mountain bikes and exclude all motorized use.

**Noxious Weeds (Invasive species)**- Non-native plants listed by the State that generally have either economic or ecosystem impacts, or are poisonous to wildlife and/or livestock. They aggressively invade disturbed areas such as fires, road slides, landslides and construction areas.

**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.

**Off-road Vehicle (ORV) -** Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, snow, ice or other natural terrain.

**Operation Permit** - Sticker placed on an OHV that allows access to public lands in designated areas in the State of Oregon.

**Outstandingly Remarkable Values (ORV) -** A characteristic of rivers or sections of rivers in the national Wild and Scenic River System. In order for a river to be included in the system, it must possess at least one 'outstandingly remarkable' value, such as scenic, recreational, geologic, fish, wildlife, historic, cultural or other similar features. ORV's are values or opportunities in a river corridor which are directly related to the river and which are rare, unique or exemplary from a regional or national perspective.

**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.

**Perennial -** A plant species having a life span of more than two years.

**Percentile Weather-** The weather conditions that can be expected of X% of days during the fire season. The standard percents are Low (0%-15%), Moderate (16%-89%), High (90%- 96%) and Extreme (97% +). So low percentile weather is the average suite of weather conditions that would occur less than 15% of the time.

**Play Area –** limited area allowing for cross-country travel.

**Prescribed Fire -** Fire which is planned and used as a tool to meet specific management objectives.

**Problem Fire-** problem fires are wildfires that, because of extreme fire behavior, present a high risk to human safety and loss of forest resources

**Project Design Criteria (PDC)-** A set of required, implementation design criteria applied to projects to ensure that the project is done according to environmental standards ad adverse effects are within the scope of those predicted in this environmental impact statement.

**Proposed Species**- Any plant or animal species that is proposed by the Fish and Wildlife Service or NOAA Fisheries in the *Federal Register* notice to be listed as threatened or endangered.

**Ranger District-** An administrative subdivision of a national forest, supervised by a district ranger who reports to the forest supervisor.

**Recreation Opportunity Spectrum (ROS)-** A framework for stratifying and defining classes of outdoor recreation based on environments, activities and experience opportunities. The settings, activities and opportunities for obtaining experiences are arranged along a continuum or spectrum divided into seven classes: primitive, Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Roaded Natural, Roaded Modified, Rural and Urban.

**Recreational Rivers-** A classification within the national Wild and Scenic River System. Recreational rivers are those rivers, or sections of rivers, that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

**Reserved Rights-** Rights tribes kept, or reserved during the treaty-making out of a greater number of rights they already owned.

**Resolved Issue**- Significant issues identified by the public that have been fully mitigated during the development of alternatives or project design criteria.

**Restoration**- Ecological restoration is the process of assisting the recovery and management of ecological integrity. Ecological integrity includes a critical range of variability in biodiversity ecological processes and structures, regional and historical context and sustainable cultural practices.

**Revegetation**- The re-establishment of plants on a site. The term does not imply native or nonnative; does not imply that the site can ever support any other types of plants or species and is not at all concerned with how the site 'functions' as an ecosystem.

**Rill -** A narrow and shallow incision into soil resulting from erosion by overland flow that has been focused into a thin thread by soil surface roughness.

**Right-of-Way**- An accurately located strip of land with defined width, beginning of point and point of ending. It is the area within which the user has the 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**- A geographic area containing an aquatic ecosystem and adjacent upland areas that directly affect it.

**Riparian Reserves**- Areas along live and intermittent streams, wetlands, ponds, lakes and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis. Riparian Reserves are important to the terrestrial ecosystem as well, serving as dispersal habitat for certain terrestrial species.

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

**Road Maintenance**- Maintaining or keeping an existing constructed road in an acceptable condition so as to continue to provide acceptable service and achieve its expected life (FSM 7712.3).

**Road Maintenance Objective-** defines the intended purpose of an individual road based on management area direction and access management objectives, Road management objectives contain design criteria, operations criteria and maintenance criteria (FSH 7709.55 Sec 33- Transportation Planning Handbook).

**Rock Crawler** – Class II ATV (jeeps, other 4-wheel drive vehicles) specifically designed to climb over rocks and boulders.

**Saddle Time**- Total time spend riding by an OHV recreationist- usually in one day.

**Scenic-** Of or relating to landscape scenery; pertaining to natural or natural-appearing scenery; constituting or affording pleasant views of natural landscape attributes or positive cultural elements.

**Scenic Integrity-** State of naturalness, or conversely, the state of disturbance created by human activities or alteration. Integrity is stated in degrees of deviation from existing landscape character in a National Forest.

**Scenic Quality**- the essential attributes of landscape that when viewed by people elicit psychological and physiological benefits to individuals and society as a whole.

**Scenic River-** A classification within the national Wild and Scenic River System. Scenic rivers are those rivers, or sections of rivers, that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible by roads.

**Seasonal Closures-** A route or area closed part of the year. The season of closure is defined by the reason for the closure (e.g. winter range, snow etc.).

**Sediment**- Any material carried in suspension by water that would ultimately settle to the bottom. Sediment has two main sources: from the channel area itself and from disturbed sites.

**Sensitive Species-** Species identified by the Regional Forester for which population variability is a concern, as evidenced by significant current or predicted downward trend in population numbers or density; or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

**Seral Stages**- Seral stages describe the phase of development of a plant community. Early seral species are those species you would expect to find on a site soon after a major disturbance, like fire. These are species such as pines, Douglas-fir, snowbrush, fireweed etc. They are generally shade intolerant species. Late seral are the species under a fully developed vegetative canopy, such as true firs, prince's pine, lichens etc.

**Shared use-** Shared use roads are those roads on which both highway legal and non-highway legal vehicles are operating and have been specifically identified and designated in the Three Trails OHV trail system.

**Silviculture**- The theory and practice of directing forest establishment, composition and growth for the production of forest resources to meet specific management objectives.

**Site**- A specific location where management activity is considered, planned or operating.

**Site preparation**- The removing or rearranging of vegetation or woody debris to meet specific management objectives. Most often it is used to describe the process(s) used to expose mineral soil areas suitable for planting or seeding desirable species of plants.

**State Historic Preservation Office-** Established in 1967 to manage and administer programs for the protection of the state's historic and cultural resources.

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

**Trail Definitions by Width** –

*Single track motorcycle trail*- width of 6-24 inches

*ATV Trail* – width of 50 inches or less

*Jeep Trail* – width of 80 inches or less

**Trail Difficulty Level-** The degree of challenge a trail presents to an average user's physical ability and skill, based on trail condition and route location factors such as alignment, steepness of grades, gain and elevation, and amount and kind of natural barriers that must be crossed, and which may temporarily change due to weather.

a. Easiest: A trail requiring limited physical ability and skill to travel.
b. More Difficult: A trail requiring some physical ability and skill to travel.
c. Most Difficult: A trail requiring a high degree of physical ability and skill to travel.

**Travel Management Rule of 11/2/2005 (36 CFR parts 212, 251, 261 and 295)-** Regulations that directs each national forest in the country to designate roads, trails and areas that would be open to motor vehicle use by vehicle class. The result of this process would be a standardized map which designates roads and trails that are open to motorized use. After a map is produced all other areas are closed to motorized use. The map would be updated annually. (*Referred to as the Final Travel Management Rule).*

**Tribe-** term used to designate a federally-recognized group of American Indians and their governing body. Tribes may be comprised of one or more Band.

**Tribal and Treaty Rights-** Native American treaty or other rights or interests recognized by treaties, statutes, laws, executive orders, or other government action, or federal court decisions.

**Treaty-** A contract or compact between nations. It is an agreement that is binding upon nations that sign the treaty.

**Unauthorized Road or Trail-** A road or trail that is not a Forest System road or trail or a temporary road or trail and that is not included in a Forest Transportation Atlas (36 CFR 212.1). The term 'unclassified' was used in some of the earlier project file documentation that predated the Travel Management Rule.

**Undesignated Road or Trail-** Roads and trails that have not yet gone through site-specific travel planning to determine if they should be open, closed or restricted to motorized vehicle use, or roads and trails that have gone through travel planning and determined that motorized vehicle use is not appropriate and is not allowed.

**U.S. Fish and Wildlife Service (USFWS)-** The federal agency that is the listing authority for species other than marine mammals and anadromous fish under the ESA.

**U.S. Forest Service (USDA FS or USFS)-** The federal agency responsible for management of the nation's National Forest lands.

**Underburn-** Using prescribed fire under the canopy of an existing stand of trees.

**Ustic**- A soil moisture regime in which moisture is limited but is present at a time when conditions are suitable for plant growth.

**Viability-** Ability of a wildlife or plant population to maintain sufficient size to persist over time in spite of normal fluctuations in numbers**,** usually expressed as a probability of maintaining a specific population for a specified period.

**Viable Population**- A wildlife or plant population that contains an adequate number of reproductive individuals appropriately distributed on a planning area to ensure long-term existence of the species.

**Viewshed**- Total visible area from a single observer position, or total visible area from multiple observer positions. Viewsheds are accumulated seen-areas from highways, trails, campgrounds, towns, cities or other viewer locations. Examples are: corridor, feature or basin Viewsheds.

**Visual Quality Objective**- A desired level of excellence based on physical and sociological characteristics of an area. Refers to the degree of acceptable alteration of the characteristic landscape.

**Watershed-** A land area that contributes all its water to one drainage system, basin, stream or river. Watersheds can be described at multiple levels.

**Wetland-** An area that is regularly saturated by surface or ground water and subsequently is characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions. Examples include: swamps, bogs, fens, marshes and estuaries.

**Wild and Scenic River System-** The Wild and Scenic Rivers Act of 1968 established a system of selected rivers in the United States, which possess outstanding remarkable values, to be preserved in a free-flowing condition. Within the national system of rivers, three classifications define the general character of designated rivers: Wild, Scenic and Recreational. Classifications reflect levels of development and natural conditions along a stretch of river. Classifications are used to help develop management goals for the river.

**Wilderness-** Areas designated by Congressional action under the 1964 Wilderness Act. Wilderness is defined as undeveloped federal land retaining its primeval character and influence without permanent improvements or human habitation. Wilderness areas are protected and managed to preserve their natural conditions, which generally appear to have been affected primarily by the forces of nature with the imprint of human activity substantially unnoticeable; have outstanding opportunities for solitude or for a primitive and confined type of recreation; including at least 5,000 acres, or are of sufficient size to make practical their preservation, enjoyment, and use in an unimpaired condition; and may contain features of scientific, educational, scenic, or historical value as well as ecological and geologic interest.

**Wildland Fire-** Any non-structure fire that occurs in the wildland. There are three types of wildland fire: wildfire, wildland fire use and prescribed fire.

**Wildfire**- An unplanned, unwanted wildland fire, including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland ire where the objective is to put the fire out.

**Winter Range-** A range, usually at lower elevation, used by migratory deer and elk during the winter months; usually better defined and smaller than summer range.

**Woody Debris**- Dead pieces of woody vegetation such as stems, limbs or leaves which are on a site.

**Xeric-** A soil moisture regime in which soil is dry for 45 or more consecutive days in the 4 months following the summer solstice, and moist for 45 or more consecutive days in the 4 months following the winter solstice.

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# Appendices

# Appendix A – Other Disclosures

**The American Antiquities Act of 1906**
This Act makes it illegal to appropriate, excavate, injure, or destroy any historic or prehistoric ruin or monument or any object of antiquity, situated on lands owned by the Government of the United States, without permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated.

**The National Historic Preservation Act of 1966, as amended**
This Act requires Federal agencies to consult with American Indian Tribes, State, and local groups before nonrenewable cultural resources, such as archaeological and historic structures, are damaged or are destroyed. Section 106 of this Act requires Federal agencies to review the effects proposed projects may have on the cultural resources of the analysis area.

Following guidelines in a 2003 Regional Programmatic Agreement among USDA-Forest Service, the Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Office (SHPO), a finding of "*No Adverse Effect*" (No Historic Properties affected) was determined under stipulation III(B)5 of the Programmatic Agreement.

**The National Environmental Policy Act (NEPA) of 1969, as amended**
The purposes of this Act are "To declare a national policy which would encourage productive and enjoyable harmony between man and his environment, to promote efforts which would prevent or eliminate damaged to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nations; and to establish a Council on Environmental Quality" (42 U.S.C. Sec. 4321). The law further states "it is the continuing policy of the Federal Government, in cooperation, to use 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 the present and future generations of Americans. This law essentially pertains to public participation, environmental analysis, and documentation.

The Three Trails OHV project followed the format and content requirements of environmental analysis and documentation. The entire process of preparing this environmental impact statement was undertaken to comply with NEPA. Cumulative effects were assessed and displayed where they occur in the manner most informative and logical to display. Also, the depth of analysis was tailored to the degree of effect. Therefore, a brief discussion is most useful to decision makers and the public to reduce paperwork and the accumulation of extraneous background data and to emphasize real environmental issues and alternatives (CEQ, 1500.2b). In many instances within this analysis, past and present activities, including timber sales, were included in the existing condition. Foreseeable actions were also addressed if there was a proposed action and if it is in the public domain.

**The National Forest Management Act (NFMA)**
The regulations in this subpart set forth a process for developing, adopting, and revising land and resource management plans for the National Forest System as required by the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended (hereafter, RPA). These regulations prescribe how land and resource management planning is to be conducted on National Forest System lands. The resulting plans shall provide for multiple use and sustained yield of goods and services from the National Forest System in a way that maximizes long term net public benefits in an environmentally sound manner

The Three Trails OHV Project followed the 1982 planning rule in the Three Trails OHV project and specifically in the proposed amendments of the Deschutes National Forest Land and Resource Management Plan.

**The Clean Air Act, as amended in 1990**
The purposes of this Act are "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population; to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution; to provide technical and financial assistance to state and local governments in connection with the development and execution of their air pollution prevention and control programs; and to encourage and assist the development and operation of regional air pollution prevention and control programs."

**Forest Order 12962 (Aquatic systems and recreational fisheries)**
This 1995 order's purpose is to conserve, restore, and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide. It requires federal agencies to evaluate the effects of federally funded actions on aquatic systems and document those effects relative to the purpose of this order. Reference Aquatic Resources, Chapter 3 for more detail.

**Executive Order 13112 (Invasive species)**
This 1999 order requires Federal agencies whose actions may affect the status of invasive species to identify those actions and within budgetary limits: "(i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species… (iii) monitor invasive species populations… (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded;…(vi) promote public education on invasive species… and (3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species… unless, pursuant to guidelines that it has prescribed, the agency had determined and made public… that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm would be taken in conjunction with the actions."

There is a moderate to high risk for spreading or introducing noxious weeds for all action alternatives in this project. The risk is proportional to the area of ground disturbance and miles of roads used in each action alternative. Highest risk is for Alternative A, followed by Alternative E, Alternative B, Alternative D and Alternative C. Weeds are already present in the analysis area, particularly along Highways 58 and 97, County Roads 46, 60, and 61, but do not overlap activity units. The Region 6 Invasive Plant Final Environmental Impact Statement (FEIS) Record of Decision (ROD) (USDA Forest Service 2005) adopted Standards and Guidelines that would be followed (Chapter 3, Invasive Plants).

**Executive Order 13443 (Hunting opportunities)**
Executive Order 13443 was signed by President Bush on August 13, 2007 and is intended to enhance hunting opportunities on federal public lands. The stated purpose of the Executive Order is to "…direct federal agencies that have programs and activities that have a measureable effect on public land management, outdoor recreation, and wildlife management, including the department of the Interior and the Department of Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitats." Hunting opportunities are disclosed in Chapter 3, Recreation and Wildlife- Big Game.

# Management Direction

## Deschutes National Forest Land and Resource Management Plan

The 1990 Deschutes National Forest Land and Resource Management Plan (Forest Plan), as amended, guides all natural resource management activities and provides standards and guidelines for the Deschutes National Forest. The standards and guidelines apply where the amendment (Northwest Forest Plan) provides no particular guidance or where the Forest Plan provides more restrictive direction than that found in the amendment.

The following Forest Plan Management Areas are found in the project area: Intensive Recreation, Old Growth Management, General Forest, Scenic Views and Wild and Scenic Rivers (see Figure 38).

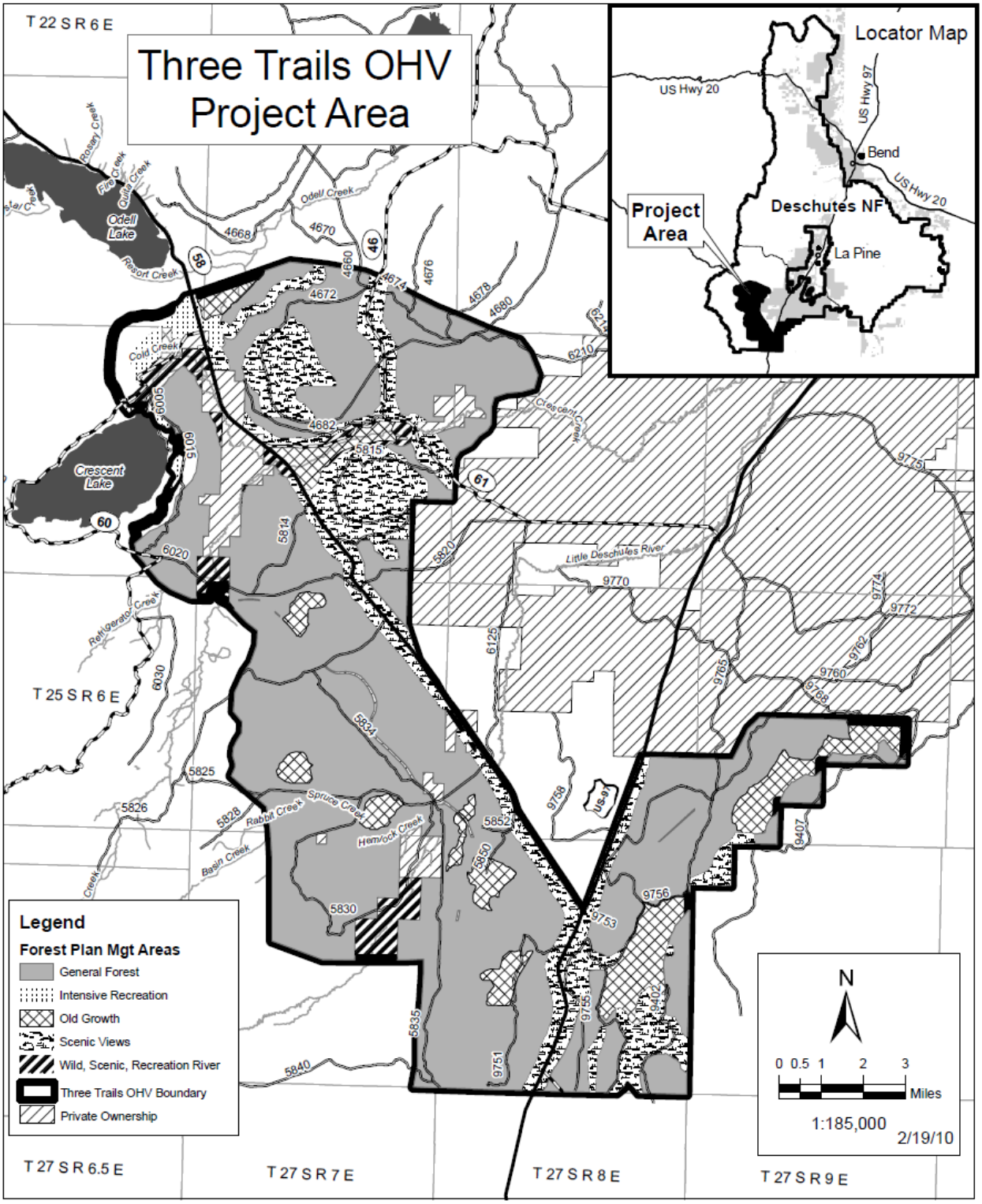


**Figure 38. Deschutes National Forest Land and Resource Management Plan Allocations within the Three Trails OHV Project Area**

***M15: Old Growth (7,666 acres)*** – The goal of this Management Area (MA) is to provide naturally evolved old growth forest ecosystems for the following purposes: habitat for plant and animal species associated with old growth forest ecosystems; representations of landscape ecology; public enjoyment of large, old-tree environments; and the needs of the public from an aesthetic spiritual sense. There are eight designated Old Growth areas within the project area.

There are no trails proposed within each Old Growth Management Areas (OGMA) in Three Trails OHV project area. The designated trail system, if traversing any of the OGMAs, would be confined to existing roads and used only as a connector route. Deschutes LRMP (M15-3) states that 'concentrated use by off-highway vehicles and snowmobiles will not be permitted but incidental use of OHVs and snowmobiles will generally be permitted.'

Three hundred sixty one (361) acres of designated Old Growth on Muttonchop Butte is being moved to an area closer to the Oregon Cascades Natural Area under a Forest Plan Amendment. This would serve to provide a large block of mixed conifer for focal species. See the Forest Plan Amendment section in Chapter 3 for more details.

***M8: General Forest (59,685 acres)*** – This MA emphasizes timber production while providing forage production, visual quality, wildlife habitat, and recreational opportunities for public use and enjoyment. While adhering to the Eastside Screens and Matrix lands (described further in this document), these are the areas of the Forest Plan where a broad spectrum of goods and services would be available to contribute to the local and regional economic well-being.

***M9: Scenic Views (15,521 acres)*** – The goal of Scenic Views management areas is to provide high quality scenery that represents the natural character of Central Oregon. Landscapes seen from selected travel routes and use areas would be managed to maintain or enhance their appearance. To the casual observer, results of activities either would not be evident, or would be visually subordinate to the natural landscape.

All activities planned in Alternatives B, C, D, and E are consistent with Goals, Objectives, and Standards and Guidelines in the Deschutes National Forest Plan because in Foreground areas, all activities are designed and located to blend into the natural landscape and are not visually apparent to the casual forest visitor (High Scenic Integrity). Also in Partial Retention, activities remain subordinate to the natural landscape (Medium Scenic Integrity). Although there would be some select designated trails near the highway and one underpass just south of the junction between Highway 58 and 97, all trails are perpendicular to the areas as viewed from the traveling public. Also, the construction and designation of staging areas would follow M9-2 'parking facilities, structures and other recreational facilities will normally be placed where there are not visible from significant viewer locations." For more information, reference the Scenic Quality section in Chapter 3.

***M17: Wild and Scenic Rivers (2,904 acres)*** – The primary objectives for managing waterways that are components of the National Wild and Scenic Rivers System would be to protect the outstandingly remarkable values identified for each and for maintaining the free-flowing nature of the river. Within the analysis area, the Little Deschutes River, Big Marsh Creek, and Crescent Creek are designated as Wild and Scenic. Management Plans have been completed for the Little Deschutes River and Big Marsh Creek and both are classified as Recreational Rivers. The management plan for Crescent Creek is currently being completed. Reference the Recreation section in Chapter 3 for a disclosure on how the activities in the Three Trails OHV project area consistent with each of the three Wild and Scenic River's Outstandingly Remarkable Values.

***M11: Intensive Recreation (1,097 acres)*** – The goal of this management area is to provide opportunities for participation in a broad range of outdoor activities. These activities would often require support facilities and often, but not always, involve a widespread use of motorized vehicles and boats. The Three Trails OHV area would have a designated area near Crescent Lake Junction, specifically Junction Sno-Park and access via a shared-use road to Simax group campground.

There are two Forest Plan Amendments for allowing summertime motorized use of a 345 acre area to the north of the private lands at Crescent Lake Junction and would include the Junction Sno-Park. This proposed change to the Forest Plan is to designate a staging area at Junction Sno-Park, associated 8+ miles of user-created trails for use by Class I and Class III (ATVs and motorcycles). This proposed change would also allow access to a safe underpass crossing of Highway 58, utilize existing snowmobile trails without further disturbance of resources, thus limiting the amount of new trail constructed, and it would provide additional opportunities for summer use of OHVs.

***Key Elk Area*** (2,516 acres) – Although not a specific management area designation, elk are found in certain key habitat areas, within which management would provide conditions needed to support certain numbers of summering and wintering elk. The Hemlock and Maklaks Key Elk Areas overlap the analysis boundary. Standards and Guidelines address recreation, road, and vegetation management. There is a Forest Plan Amendment to adjust the boundary of the existing Hemlock Key Elk area to include better habitat in the form of stringer meadows, which are important for calving and foraging. The total amount of acres contained within the Key Elk area would remain the same at 2,511.

***Management Indicator Species*** – This is not a specific management area; however, the Deschutes LRMP identifies a group of wildlife species as management indicator species (MIS). These species were selected because their welfare could be used as an indicator of other species dependent upon similar habitat conditions. The species selected for the Deschutes National Forest include the redtail hawk, golden eagle, osprey, peregrine falcon, northern bald eagle, northern spotted owl, northern goshawk, coopers hawk, sharp-shinned hawk, three-toed woodpecker, American marten, osprey, woodpeckers, great gray owl, great blue heron, waterfowl, wolverine, elk, mule deer, western big-eared bat, species associated with logs and down woody debris, and species associated with various plant communities and successional stages. Reference the MIS section in Chapter 3 for a detailed analysis.

***Unroaded*** – The analysis area does not contain any Inventoried Roadless Areas. The western boundary of activity abuts the Oregon Cascades Recreation Area, which may be considered unroaded for large portions. Reference Chapter 3 (Recreation) for a discussion on the effect to unroaded areas.

***Other Ownership (4,726 acres)*** – Consisting of private landowners scattered throughout the Three Trails OHV project area. There are no designated trails on private lands.

***Wilderness (848 acres)*** – This is not a specific management area; however, the Deschutes LRMP identifies in Appendix A all the Wildernesses in the Deschutes National Forest. Although the planning area overlaps a portion of the Diamond Peak Wilderness, there are no designated trails in the Wilderness. There are no designated trails in the Diamond Peak or Mt. Thielsen Wilderness areas. Reference Chapter 3, Recreation, for a discussion on effects to Wilderness values.

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## Northwest Forest Plan

Approximately one third (32,044 acres) of the Three Trails OHV project area is within the Northwest Forest Plan allocations. Of the three subunits, Junction, Rivers, and Walker, Junction contains the most land area managed under the Northwest Forest Plan. Rivers subunit has matrix lands along the western boundary but there are no designated trails in this part of the analysis area. Walker Rim subunit has no Northwest Forest Plan allocations. The purpose of the Northwest Forest Plan is for management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl. The following Northwest Forest Plan land allocations are found in the analysis area: Administratively Withdrawn Areas, Late Successional Reserve, Congressionally Withdrawn, and Matrix.

The following Figure 39 can be used to reference Northwest Forest Plan allocations within the project area.

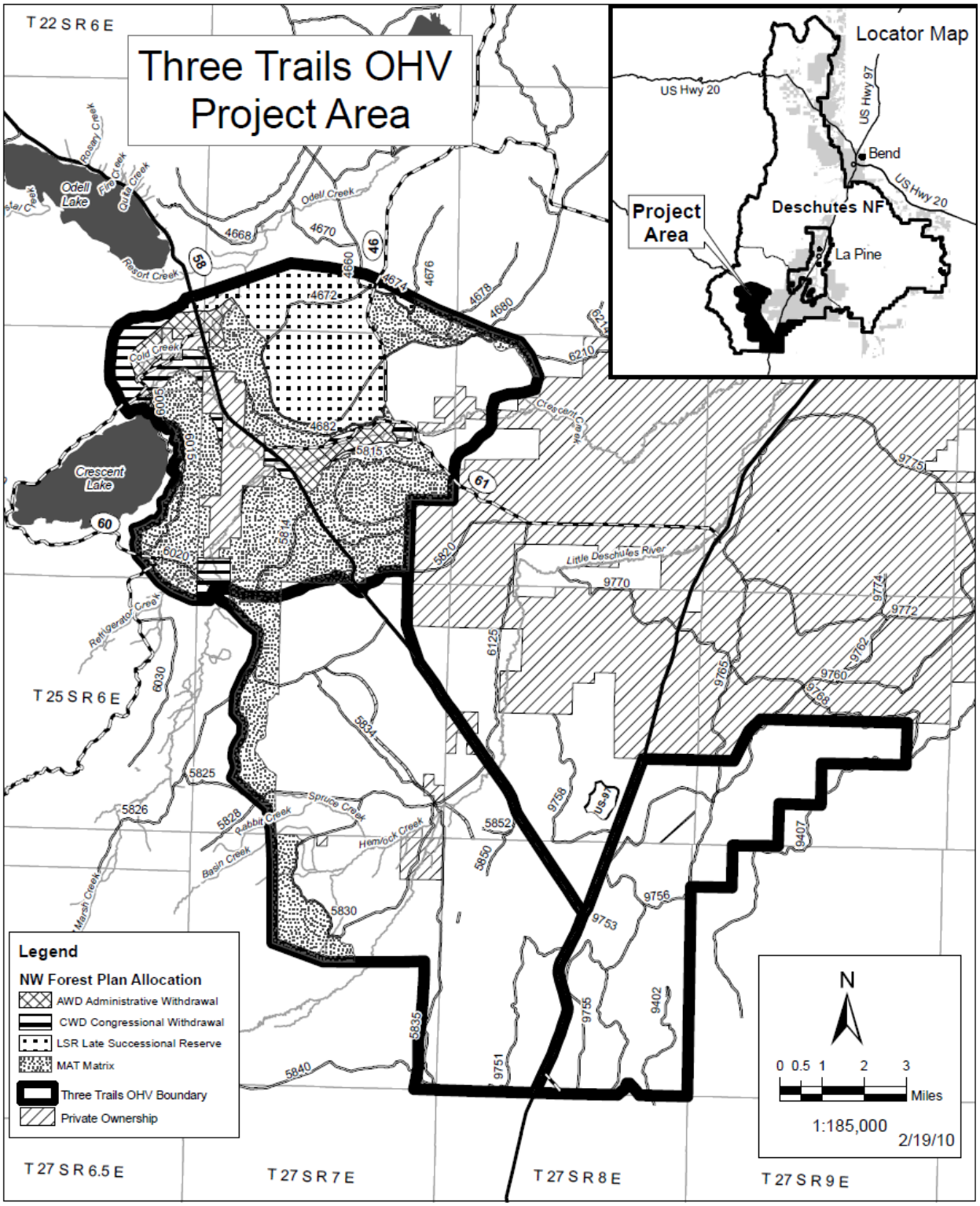


**Figure 39. Northwest Forest Plan Land Allocations within the Three Trails OHV Project Area**

***Matrix (20,043 acres)*** – Although there would be very little vegetation affected by the trail building and maintenance activities, most timber harvest and silvicultural activities were specified to occur within these lands where suitable (ROD, C-39).

***Congressionally Reserved (2,606 acres)*** – These areas maintain management direction of the Deschutes Forest Plan. They include lands with congressional designations that normally preclude scheduled timber harvest. In this analysis area, this allocation overlays the Diamond Peak Wilderness and Wild and Scenic Rivers (Chapter 3).

***Administratively Withdrawn Areas (2,078 acres) -*** These areas are identified in current Forest Plans where the management emphasis is on recreation and visual areas, back country, and other areas. The land area around Crescent Lake (including the lake itself) is the only area on the Three Trails OHV project area whose management direction is Administratively Withdrawn (ROD, C-29).

***Late-Successional Reserves (7,317 acres)*** – The objective of the Late-Successional Reserves is to protect and enhance conditions of late-successional and old-growth forest ecosystems and which serve as habitat for late-successional and old-growth related species like the northern spotted owl (ROD, C-9). There are no designated trails within the late-successional reserve, but existing shared-use roads would be used for connectivity.

***Riparian Reserve (6,433 acres)*** – As part of the Northwest Forest Plan's Aquatic Conservation Strategy and Inland Native Fish Strategy (east of the Northwest Forest Plan), Riparian Reserves are lands along streams and unstable and potentially unstable areas where special standards and guidelines direct land use. The objective is to restore and maintain the health of watersheds and the aquatic ecosystems they contain. Riparian Reserves overlap the Management Allocations listed above and on private lands. There are 4,361 acres of Riparian Reserves/Riparian Habitat Conservation Areas on Forest Service lands and 2,072 acres on private lands within the Three Trails OHV analysis area.

"The intent is to ensure that a decision maker must find that the proposed management activity is consistent with the Aquatic Conservation Strategy objectives. In order to make the finding that a project or management action 'meets' or 'does not prevent attainment' of the Aquatic Conservation Strategy objectives, 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 or management action maintains the existing condition or moves it within the range of natural variability" (1994 ROD, Attachment B, p. B-10).

The existing condition discussion, including biological and physical components of the riparian condition, is found in soil quality, hydrology, and fisheries sections in Chapter 3 of this FEIS. These components are closely associated with the vegetative condition. Additional discussion on the Transportation system, Best Management Practices, and effects on Riparian Reserves is also found in Chapter 3 and Appendix B).

# Appendix B - Best Management Practices

These Best Management Practices (BMPs) are the closest match for the roads and designated trails and would be used to design proposed activity area in the Three Trails OHV project area. These best management practices have been used in similar projects

1. Select and design BMPs based on site-specific conditions, technical and economic feasibility, and water quality standards for those waters potentially impacted.

2. Implement and enforce BMPs.
3. Monitor BMPs to ensure correct application and effectiveness as designed in attaining water quality standards.
4. Mitigate to minimize impacts caused by activities when BMP's do not perform as expected.
5. Adjust BMP's when there is evidence that beneficial uses are not protected and water quality standards are not achieved. Evaluate the adequacy of water quality criteria for assuring protection of beneficial uses. Recommend adjustments to water quality standards as appropriate."

**Road System Best Management Practices:**

R-1 Title: Guidelines for the Location and Design of Roads.

Objective: To located and design roads with minimal resource damage.

R-2 Title: Erosion Control Plan.

Objective: To limit and mitigate erosion and sedimentation through effective planning prior to initiation of road constructions activities and through effective contract administration during construction.

R-3 Title: Timing of Construction Activities.

Objection: To minimize erosion by conducting road construction operation during minimal runoff periods.

R-6 Title: Dispersion of Subsurface Drainage Associated with Roads.

Objective: To minimize the possibilities of roadbed and cut or fill slope failure and subsequent production of sediment:

R-9 Title: Timely Erosion Control Measures on Uncompleted Roads and Stream Crossing.

Objective: To minimize erosion of and sedimentation from disturbed ground on incomplete projects.

R-13 Title: Diversion of Flow around Construction Sites.

Objective: (1) To ensure all stream diversion are carefully planned, (2) to minimize downstream sedimentation, (3) to restore stream channels to their natural grade, condition, and alignment as soon as possible.

R-14 Title: Bridge and Culvert Installation and Protection of Fisheries.

Objective: To minimize sedimentation and turbidity resulting from excavation for in-channel structures.

R-18 Title: Maintenance of Roads.

Objective: To maintain roads in a manner which provides for water quality protection by controlling the placement of waste material, keeping drainage facilities open, and by repairing ruts and failures to reduce sedimentation and erosion.

# Appendix C – RESPONSE TO COMMENTS

## Content Analysis Process

The following is a summary of public comments received by the Crescent Ranger District regarding the Draft Environmental Impact Statement (DEIS) for the Three Trails OHV Project. The DEIS was made available for a 45-day comment period, under the provisions of the National Environmental Policy Act (40 CFR 1500-1508) and Notice, Comment, and Appeal Procedures for National Forest System Projects and Activities (36 CFR 215).

Content analysis is a method for analyzing public comment. This process strives to identify all relevant issues represented by the public. The intent is to represent the public's viewpoints and concerns as fairly as possible, and to present those concerns in such a way as to assist the Interdisciplinary Team to effectively respond to them. It is important to recognize that the consideration of public comment is not a vote-counting process in which the outcome is determined by the majority opinion. Relative depth of feeling and interest among the public can serve to provide a general context for decision-making. However, it is the appropriateness, specificity, and factual accuracy of comment content that serves to provide the basis for modifications to planning documents and decisions.

Comments were received from 40 different parties (respondents) in 26 letters (responses). A total of 201 comments were contained in these letters. Comments were received at a public meeting held October 21, 2010 as well as through the mail and email. All but 2 respondents reside in Oregon and 17 letters were received from various interested organizations and groups. Of those, 3 are federal government agencies whose letters are contained in this document. All responses (letters) were received within the comment period which was from October 1, 2010 to November 15, 2010.

## List of Respondents

| Date Recvd. | Letter # | Name | Organization | City/State | # of Comments |
|---|---|---|---|---|---|
| 10/20/10 | 1 | George Law | Individual | Albany, OR | 4 |
| 10/14/10 | 2 | The Warrens | Individuals | Oregon City, OR | 5 |
| 10/13/10 | 3 | Misha Williams | Individual | Bend, OR | 4 |
| 11/05/10 | 4 | Kent Barnes | COMAC | Redmond, OR | 2 |
| 10/21/10 | 5 | Jared Achepohl | Emerald Trail Riders | Eugene, OR | 1 |
| 10/21/10 | 6 | Duane W. Mogstad | Walker Rim Riders | Eugene, OR | 2 |
| 10/21/10 | 7 | Randy Rasmussen | American Hiking Soc. | Corvallis, OR | 2 |
| 10/21/10 | 8 | Joni Mogstad | Walker Rim Riders | Eugene, OR | 4 |
| 10/21/10 | 9 | Rick Wobbe | Emerald Trail Riders | Eugene, OR | 1 |
| 11/08/10 | 10 | Reid Sherwin et al (6 people) | Four Runners of Klamath Falls | Klamath Falls, OR | 5 |
| 10/21/10 | 11 | John Zigler | Deschutes County 4 Wheelers | La Pine. OR | 2 |
| 11/10/10 | 12 | Preston A. Sleeger | US Dept. of Interior | Portland, OR | 0 |
| 11/10/10 | 13 | Mark Zertanna | Individual | Hillsboro, OR | 7 |
| 11/12/10 | 14 | Glen Ardt | OR. Dept. of Fish & Wildlife | Bend, OR | 12 |
| 11/13/10 | 15 | Larry Ulrich | Ochoco Trail Riders | Bend, OR | 1 |

| Date Recvd. | Letter # | Name | Organization | City/State | # of Comments |
|---|---|---|---|---|---|
| 11/14/10 | 16 | Ron Grace | Individual | unknown | 1 |
| 11/15/10 | 17 | Curtis Dorn | Ochoco Trail Riders | | 1 |
| 11/15/10 | 18 | Peter Mayer | Individual | | 1 |
| 11/09/10 | 19 | Randy Drakes | Deschutes County 4 Wheelers | Bend, OR | 39 |
| 11/15/10 | 20 | Ryan Moeggenberg | Back Country Horsemen | Bend, OR | 2 |
| 11/15/10 | 21 | Kenna Hoyser | Oregon Equestrian Trails | Powell Butte OR | 2 |
| 11/15/10 | 22 | Ben F. Sunderland | Individual | Walterville, OR | 3 |
| 11/15/10 | 23 | Pat Marquis | Equestrian | Terrebonne, OR | 3 |
| 11/15/10 | 24 | Dan Fouts | Equestrian | Prineville, OR | 2 |
| 11/15/10 | 25 | Randy Rasmussen<br>Asante Riverwind<br>Ben Gordon<br>Marilyn Miller<br>Karen Coulter<br>Shannon Wilson<br><br>Doug Heiken<br>Sarah Peters<br>Forrest McCarthy | Cascadia Wildlands<br>Gaia Ki<br>Bend Back Country Alliance<br>Juniper Group Sierra Club<br>LOWD-Blue Mts.Biodiversity<br>LOWD-Cascadia's Ecosystem Advocates<br>Oregon Wild<br>Wildlands CPR<br>Winter Wildlands Alliance | Corvallis, OR<br>Bend, OR<br>Bend, OR<br>Bend, OR<br>Fossil, OR<br>Eugene, OR<br><br>Eugene, OR<br>Eugene, OR<br>Boise, ID | 90 |
| 11/22/10 | 26 | Christine B. Reichgott | US Environmental Protection Agency | Seattle, WA | 5 |

| Letter #1 | George D. Law |
|---|---|
| 1-1 | ***Alternative C would help disperse the users over a larger area than the others helping to reduce the environmental impact.***<br><br>Response: No response is necessary |
| 1-2 | ***I see that the Sno Park near Crescent Junction is listed as day use only. Why not have it for camping also? It is already established (no cost). It is close to a store, gas station, and restaurant and otherwise not used much during the spring, summer and fall.***<br><br>Response: This was considered as an alternative considered but eliminated from detailed analysis (DEIS, page 61). There is a lack of facilities to support summertime overnight operations; however several overnight camping opportunities nearby, including private facilities at Crescent Lake Junction would provide more than adequate amenities for the Junction area. |
| 1-3 | ***For years we have been camping near the Little Deschutes River, south of the train tracks, east of the river, near where road 5835 bends and heads south. Will that campsite be moved leaving only a foot trail to the river?***<br><br>Response: At this time, the camping area the commenter has identified is not included in the proposed activities for any action alternative. However, given the adaptive management desired for the area, it is |

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| | likely that campsite would be moved in the future if it has potential to affect water quality. Also, as a reasonably foreseeable action, the implementation of the Travel Management Rule, it is likely motorized access would change. |
| **1-4** | ***A season of May through October was mentioned. Some good weather years we are able to get over there during March or April. I would hope that would not be stopped.***<br><br>Response: A Project Design Feature was included for all action alternatives that would provide for a general season of use from May through October in order to "maintain soil quality and to ensure maintenance of a quality trail riding experience for the users a general season of use would normally be from May 01- Oct 31 (DEIS, page 54)." This would be a site specific condition assessed at the start and end of each season of use based on snow levels and trail conditions. To lengthen or shorten this time would be the District Ranger's determination and communicated to the public through the central Oregon website, posting at staging areas, and personal contact. |
| **Letter #2** | **The Warrens** |
| **2-1** | ***I…offer that Alternative B is the best selection for the following reasons: We own property within the Two Rivers North subdivision and enjoy ATV activity within that area.***<br><br>Response: No response is necessary. |
| **2-2** | ***I…offer that Alternative B is the best selection for the following reasons: …We are also hunters and realize that there are needs to enhance habitat for big game.***<br><br>Response: No response is necessary |
| **2-3** | ***I…offer that Alternative B is the best selection for the following reasons: …We do not agree with ATV users creating their own trails and crossing the Little Deschutes River and support alternative crossings that are not within the current TRN road district.***<br><br>Response: No response is necessary |
| **2-4** | ***I…offer that Alternative B is the best selection for the following reasons:…We see the benefit of offering 2 crossings for HWY 97 and the railroad to reduce the likelihood of an injury accident.***<br><br>Response: All Action Alternatives incorporate an underpass (utilized by both OHVs and wildlife) for Highway 97 south of the Highway 97/58 junction, as well as a railroad crossing south of the 5825 road. An existing underpass for Highway 58 at Crescent Lake Junction is incorporated into a shared use route; however a second underpass for Highway 97 is not planned at this time (DEIS Alternatives Chap 2 and Table 8 pg 64). The costs for such undercrossings are expensive and funding the one underpass is all the Forest Service and its partners can afford. |
| **2-5** | ***I…offer that Alternative B is the best selection for the following reasons: …We strongly oppose the closing of the current access to Muttonchop Butte and believe the noise dampening [sic] effect would not be noticeable.*** |

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| | Response: The Responsible Official will select an alternative after reviewing public comment and the analysis of effects. |
| **Letter #3** | **Misha Williams** |
| **3-1** | ***After reviewing the DEIS…I was concerned that the spread of noxious and invasive weeks (sic) was not addressed as well as it could be. Specifically the plan outlines areas of current infestations and steps to control weeds once they have spread to an area, but does not adequately outline steps to prevent their introduction to new areas by OHV use.***<br><br>Response: Pages 55 and 56 of the DEIS incorporate preventative steps to prevent introduction of invasive plants such as equipment cleaning and certified weed-free materials. In addition, page 59 includes monitoring of the entire trail system. |
| **3-2** | ***I would like to see the plan include provision for ongoing education and prevention [regarding invasive plants]. This could be partially accomplished by creating education stations and signage at trailheads and staging areas. Pictures of noxious/invasive species and a brochure box on noxious weed identification could be utilized as well as steps outlining what OHV users could and should do to prevent unintended introduction or spread of these unwanted species to an area and how to report sightings of new areas of infestation. Outreach education could also be done with OHV rider groups.***<br><br>Response: Page 414 of the DEIS acknowledges education and signing at the staging areas as an important tool that would be utilized as a prevention strategy for potential introduction and spread of invasive plants. Typically, field rangers and OHV personnel use information materials (as suggested) in their education efforts. Education material for the prevention of invasive plants is also part of the packet with trail system Motor Vehicle Use Maps distributed online and in Forest Service offices. The Forest Service works closely with local weed boards, Oregon Department of Agriculture, and other private, state and federal agencies to present a unified approach to weed prevention. The suggestion to outreach with OHV rider groups is excellent and would be incorporated into the program. |
| **3-3** | ***…area of concern I have is the roads to be used as trails near Diamond Peaks. …the 4672 road appears to be the road that would be used as a trail. However, some OHV riders currently use our subdivision's privately maintained roads to access 4672-900(?) where it connects with Royce Pine Road. This road is considered to be an important alternate escape route in the event of wildfire…and I don't want to see it closed to vehicle use. I would like to see signs placed at this junction to advise OHV riders that if they utilize this road…they are entering a private subdivision/private roads where OHV use is prohibited. ..a gate could be erected at this location to prevent access except in the event of emergency (keys in possession of CCF&EMS/Sheriff's Dept. and Walker Range).***<br><br>Response: Forest Service Road 4672 is part of the proposed OHV route and the 900 spur is not. However, the 4672-900 would continue to be open to motorized vehicles. The Forest service works closely with the Walker Range Fire Patrol Association, which is the agency with the primary responsibility for fire prevention and control on private lands within the Three Trail OHV project area. There are no plans to close road 4672-900 or any other coordinated alternative escape route at this time. The Forest Service can only regulate access onto public lands. In addition, all gating for emergency access should be coordinated through the Walker Range Fire Patrol Association. |

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| **3-4** | ***There is another access point to forest roads at the end of Lake Vista Way. It is very steep and eroded and crosses private property at this location. It is currently used by OHVs in summer and snow machines in winter to access nearby forest roads in the area. I would like to recommend that this access point be blocked off as well and/or signs placed…***<br><br>Response: As in the previous response, the Forest Service can only regulate access onto public lands. |
| **Letter #4** | **Kent Barnes** |
| **4-1** | ***If the decision is to stay with Alternative E, I would only have a few concerns….<u>Lack of Camping areas</u>. …you only have two camping areas. Boundary springs and Simax group camp. As this system is developed, I feel that the number of trail users from farther away will increase and this will require the need for more camping facilities. One alternative may be to allow overnight camping at the Crescent Lake snow park for RVs; no tent camping and no camp fires. …Other alternatives would be to enlarge the Boundary springs campground or develop another campground on the south near Highway 97.***<br><br>Response: At this time, there would be no campground expansions considered in the proposed activities associated with this project because it is outside the scope of this analysis. However, other opportunities are available. Table 25 on page 93 of the DEIS describes the amenities associated with a fully developed staging area: campsites, parking areas, and toilets. Table 29 of the DEIS on page 99 lists Rivers North as a fully developed camping area, along with Simax Beach as an existing camping area. However, visitors can trailer their vehicles to numerous campgrounds surrounding the lakes in the Crescent Lake Junction area, Crescent Creek, or utilize nearby private RV parks in the Junction segment (page 61, DEIS). |
| **4-2** | ***If the decision is to stay with Alternative E, I would only have a few concerns….<u>Total number of miles</u>…Alternative E has 142 miles of engineered trails. Please do not drop below that. …another National Forest stated the preferred alternative stated 360 plus miles and Record of Decision came out with only 146 miles.***<br><br>Response: Other than slight on-the-ground adjustments to the trail during layout/implementation to place the trail in the proper location while avoiding sensitive areas, mileage would remain close to that stated in the DEIS. The designated trail system would be implemented in segments as funding and logistical support allows. |
| **Letter #5** | **Jared Achepohl** |
| **5-1** | ***I would appreciate more emphasis on single track. There needs to be a balance for all OHV classes. …The long loop south of Two Rivers should be partitioned and expanded to provide loop choices. The area north of the Rivers North stage could be dedicated to Class III only (map provided).***<br><br>Response: THe DEIS has the following on page 88: OHV users are a diverse group with varying desires and expectations. Not all vehicle classes perform the same on any given terrain or trail layout (Crimmins 2006). Some user separation would enhance specific rider experiences. On the other hand, providing separate trails for different vehicle classes can be expensive, cause resentment, be difficult to enforce, and limit opportunities for communication and cooperation (FHWA 1994). |

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| | The separation of classes of vehicles was made of particular concern for some four-wheel, ATV and motorcycle riders as they expressed their preferences during Three Trails OHV project public meetings. Some motorcycle enthusiasts want only single-track trails (6 - 24 inches wide). Maintaining trails for this experience means excluding four-wheel ATVs. On the other hand, it is common for a family or group of friends to visit the Forest with more than one vehicle class in tow. Such a group usually would prefer routes open to more than one vehicle class.<br><br>Alternative E offers 19 miles exclusively for Class III vehicles, including the 10 mile loop and around Little Odell Butte. Also, this alternative offers approximately 100 miles of trail for Class 1 vehicles for which Class III users can ride. This does not preclude more Class III trail in the future with appropriate NEPA. |
| **Letter #6** | **Duane W. Mogstad** |
| **6-1** | ***Alternative A should be used because it has road numbers and a person can tell where they are most of the time. …Any of the other alternatives are going to be too confusing and will cause some people to not [be] able to see our back woods and appreciate the environment that we are supposedly saving for future generations.***<br><br>Response: All action alternatives would include a site-specific trail map that would show motorized routes and route numbers (page 413, DEIS). This approach is consistent with maps developed through the COHVOPS for other designated motorized trail systems in central Oregon such as the East Fort Rock, Henderson, and Millican Valley Trail systems. These maps also show the roads that are open to other motorized use and are not a part of the designated trail system, and include information such as how to prevent introduction of invasive plants, operator responsibilities, trail etiquette, and examples of trail signing. These maps have been used for many years throughout central Oregon and have been very successful with riders. The Deschutes National Forest will also be publishing an annual Motor Vehicle Use Map following completion of the Final Environmental Impact Statement and Record of Decision for the Travel Management Project in accordance with 35 CFR 212. This map will show all of the roads and motorized trails open to the public according to the class of vehicle (highway legal vehicle or non-highway legal vehicles), size of vehicle permitted on motorized trails, and season of use the roads and trails are available. |
| **6-2** | ***Alternative B would be the next preferred if it was allowed to camp in the staging area; need more room to camp though. If not, there needs to be more access to existing camping.***<br><br>Response: Alternative B has three designated staging areas that allow overnight camping at Rivers Midway, Rivers South, and Walker Midway (DEIS Chap 2 Table 6 page 63; and Chapter 3 Recreation Table 25 page 93). In addition, riders can trailer their vehicles and camp at any existing developed camping areas and several private RV parks at Crescent Lake and Crescent Lake Campground. If monitoring determines camping opportunities need expanding or additional access is needed, then the appropriate analysis and public involvement would be required. |
| **Letter # 7** | **Randy Rasmussen** |
| **7-1** | ***The proposed open road (ML2) running east-west just south of Two Rivers to the Little Deschutes River presents a problem in that: It is within the Wild and Scenic River boundary.*** |

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| | Response: Off-Highway Vehicle trails are allowed in Wild and Scenic Rivers under certain circumstances and are consistent with the Little Deschutes Wild and Scenic River Plan. All action alternatives are designed to protect the Outstandingly Remarkable Values. The Little Deschutes River is classified as "Recreational" under the Wild and Scenic River Act. Standards and guidelines in the Big Marsh Creek and Little Deschutes River *Wild and Scenic Rivers Management Plan* allows for 'Motorized use, by Class I, II, and III ATVs, and restricts them to roads and trails designated for ATVs and/or snowmobiles' (page 14). The Deschutes Land and Resource Management Plan M17-5 for Recreational rivers states; "Motorized travel on land or water may be permitted, prohibited, or restricted. Controls will usually be similar to surrounding lands and waters" (page 4-158). The plan also states under M17-6: "Opportunities for OHV use on other than system roads will not be provided in areas of concentrated recreation use or where sensitive resource values would be adversely affected. Future planning will define areas where OHV use may be used and the necessary management requirements for their use within the river corridors." An extensive analysis of the effects to Wild and Scenic River values can be found on page 81 of the Recreation section in the DEIS. |
| **7-2** | ***The proposed open road (ML2) running east-west just south of Two Rivers to the Little Deschutes River presents a problem in that: …It will bring motorized uses to the river's edge and make it tempting for dirt bikes and ATVs to attempt to ford the river.***<br><br>Response: Table 101 of page 343 displays a significant reduction for all action alternatives in roads and trails open for motorized travel within the riparian areas for both rivers. Also restoration activities for those places that are most affected by motorized activities would be restored by activities that direct use away from water, place barriers where appropriate, and plant vegetation in denuded areas. Regarding the ability to enforce unlawful behavior, the Action Alternatives facilitate far less complicated enforcement efforts by officers when they encounter OHVs in a place that is clearly not authorized. All action alternatives include a very detailed education, enforcement, safety, and operational plan (DEIS, page 416), which includes a sense of commitment and ownership by the riders. This integrated model has served central Oregon well and has proven successful on several destination trail systems within the Central Oregon Off-Highway Vehicle Operations area. Where enforcement has been difficult in the past because of cross-country travel and complicated and inconsistent rules, now users have uniform and consistent direction where they can and cannot ride. Being in the wrong place is cause for law enforcement action. |
| **Letter #8** | **Joni Mogstad** |
| **8-1** | ***Make sure the" dead ends" are really loops.***<br><br>Response: There were some minor errors on the Alternative E map regarding "dead ends" whereas the other action alternatives correctly displayed the loops. This errata change does not change the effects displayed as it is less than one half percent of the total route miles displayed for Alternative E and the Interdisciplinary Team had the correct Geographical Information System layer for their analysis. The FEIS will display this correction. |
| **8-2** | ***Make sure there are sanitary facilities and water sources at each staging area.***<br><br>Response: Fully developed and semi-developed staging areas would have sanitary facilities (DEIS Chapter 3 Recreation and Table 25 page 93). Providing water for each staging area was considered but |

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| | eliminated from detailed analysis due to the cost associated with implementation and maintenance of such a system. |
| **8-3** | ***Keep looking for "Jeep" challenges.***<br><br>Response: While roads maintained for high clearance vehicles would be available to all OHV classes, the southern area would have developed trails for the Class II user. Although preferred Class II terrain is very limited on the Crescent Ranger District due to the relatively flat topography mostly absent of geographical obstacles, there are opportunities to work with the Class II users and design the available trail system to provide challenges within the prism of the roads and trails that were analyzed. |
| **8-4** | ***It is important to have connectivity to other road and trail systems. Try to encourage cooperation with the Fremont/Winema Forests on connectivity.***<br><br>Response: The Fremont/Winema and Crescent Ranger District staffs have been working together on coordinating on existing connections. |
| **Letter #9** | **Rick Webbe** |
| **9-1** | ***Alternative E looks very promising. With a few tweaks, it would be a very livable proposal. Add some of the Alternative C Walker Class I and III mileage to Alternative E. More Class III single track connectors would help alleviate congestion on the loops proposed; not as concentrated as Alternative D.***<br><br>Response: Monitoring will be an element of this decision. If it determined more trail is needed to alleviate congestion, then the appropriate analysis and public involvement would be initiated. Minor changes may be needed during implementation to better meet on-site conditions. At that time, the Responsible Official will determine whether and what kind of further NEPA action is required, considering the criteria for whether to supplement an existing Environmental Impact Statement in 40 CFR 1502.9(c) and FSH 1909.15, sec. 18, and in particular, whether the proposed change is a substantial change to the intent of Alternative E, and whether the change is relevant to environmental concerns. Connected or interrelated proposed changes regarding particular areas or specific activities will be considered together in making this determination. The cumulative impacts of these changes will also be considered. |
| **Letter #10** | **Four Runners of Klamath Fall, Trail Committee** |
| **10-1** | ***We strongly prefer Alternative C with the modifications discussed in these comments. As users of Class II trails within the OHV community, we require the roads must be obliterated and reconstructed with the following trail elements: native trail surface; slopes over 30%; obstacles such as rocks, logs, ledges, mud and/or snow; trail filters; narrow trail corridors; sharp turns and curves; loops and destinations; play areas; cattle guards; and water bars. The design parameters for an OHV Class II trail are presented in the Forest Service Handbook 2309.18. Chapter 20, 23.23. Based upon OHV Class II user preferences a Class II trail is the most desirable and would be considered a "More Difficult" trail.***<br><br>Response: Although preferred Class II terrain is very limited on the Crescent Ranger District due to the relatively flat topography mostly absent of geographic obstacles, there are opportunities to work with the Class II users and design the available trail system to provide challenges within the prism of the |

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| | roads and trails that were analyzed. Several Class II users at the public meetings have acknowledged this situation. |
| **10-2** | ***We strongly prefer Alternative C with the modifications discussed in these comments. …NEPA requires accurate and expert site-specific and cumulative impacts analysis. The impact of all trail users, motorized and non-motorized should be equally considered…….If these proposed trails will be open to both motorized and non-motorized users, then all of the impacts must be analyzed in the DEIS, not just those associated with the motorized users.***<br><br>Response: The DEIS/FEIS analyzes the effects of uses of the designated trail system on both motorized and non-motorized trail users in accordance with NEPA regulations. (Ref Chap 3, Recreation). The designated motorized trail system would be open to hikers, mountain bikers, and equestrians if they choose to use the trails.<br><br>There is no documented evidence of conflicts between motor vehicle uses and other recreational uses on the Crescent Ranger District. The assumption is that the Ranger District is not as visited as nearby Ranger Districts, thereby there is ample room for most activities. Designation of a motorized trail system would further separate uses and provide areas for quiet recreation. Reference Chapter 3 for a discussion on the types of uses that occur on the Ranger District and how they are affected by this project (DEIS, page 448). A considerable portion of the analysis is dedicated to non-motorized experiences and the analysis determined both types of recreation benefit from designated motorized trails. The analysis also assumes the greatest potential for conflict exists on the Metolius-Windigo trail in the Junction segment. A key issue and Project Design Features were developed to respond to the shared use of the Metolius-Windigo trail. |
| **10-3** | ***We strongly prefer Alternative C with the modifications discussed in these comments. …In order to be a factually based document, Class II trail mileage must be broken out each and every time that OHV trail mileage is given, as the miles are not equal.***<br><br>Response: It is acknowledged that the Class II trail miles are not equal. Class II opportunities are most clearly specified by alternative in Table 4, page 63 of the DEIS. Tables 26 and 27 on pages 96 and 97 also assign values by class of vehicles. Further in the recreation section is an analysis of effects to the Class II user. An appropriate level of detail is provided for the subject matter discussed. |
| **10-4** | ***We strongly prefer Alternative C with the modifications discussed in these comments. …Unrestricted cross country travel is currently legal in most areas of the forest. Although Maintenance Level 1(ML 1) roads are not considered "open", they are legal for use under the current status of "unrestricted cross country travel". OHV enthusiasts often use these ML 1 roads because they provide a desirable experience without causing resource damage and their use does not increase the mileage of user-created trails. The phrase "non-authorized use from motorized travel (primarily OHVs)" inaccurately infers unlawful behavior.***<br><br>Response: This definition has been corrected in the FEIS, page 135. There is resource damage occurring on the roads attributable to OHV use which constitutes unauthorized use. It is a violation of CFR CFR 261.12c or CFR 261.15h.<br><br>The commenter has mischaracterized the nature of how cross-country travel is currently allowed on the Deschutes National Forest. This is most accurately captured in the Deschutes and Ochoco Travel |

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| | Management Project Draft Environmental Impact Statement, Chapter 2. In summary, there is a mixture of prohibitions and restrictions across the forest. However, even where cross-country travel is allowed, there is still a requirement or "restriction" that cross-country travel be conducted without damage to National Forest resources. |
| **10-5** | ***This DEIS proposes a season of use from May 1 to October 31. Throughout the Deschutes National Forest, winter OHV closures are from December 1 to March 31. Adopting a different closure season than the rest of the forest will create confusion for the OHV community.***<br><br>Response: A season of use must match the environmental conditions for the area and the Three Trails OHV project area is quite different than trail systems such as the East Fort Rock OHV area. It was designed to provide for a general season of use in order to "maintain soil quality and to ensure maintenance of a quality trail riding experience for the users …" (DEIS, page 54). This would be a site specific condition assessed at the start and end of each season of use based on snow levels and trail conditions. To lengthen or shorten this time would be the District Ranger's determination. |
| **Letter #11** | **John Zigler** |
| **11-1** | ***If there aren't enough Class II trails, you are going to have a battle with the Class II Associations.***<br><br>Response: Although preferred Class II terrain is very limited on the Crescent Ranger District due to the relatively flat topography mostly absent of geographic obstacles, there are opportunities to work with the Class II users and design the available trail system to provide challenges within the prism of the roads and trails that were analyzed. Several Class II users at the public meetings have acknowledged this situation. |
| **11-2** | ***Trails need to be loops or connect to other trails.***<br><br>Response: This was the intent in the design of the trail system and collaboration with the users themselves and the Central Oregon Combined Off-Highway Vehicle Operations personnel. |
| **Letter #12** | **Preston A. Sleeger for the Department of the Interior** |
| **12-1** | The Department of the Interior reviewed the document and had no comments to submit. |
| **Letter #13** | **Mark Zertanna** |
| **13-1** | ***529 pages are beyond comprehension for any report that you want public input on. …You need to find a way to get to the point quicker and loose a lot of the meaningless information.***<br><br>Response: No response is necessary |
| **13-2** | ***Significant reference to wildlife disruption is made; what documented statistics do you have that wildlife is truly impacted by ATVs? In my years of riding, I have come across a lot of wildlife and they most often just ignore us. What are the statistics you have to support your numerous concerns?***<br><br>Response: The commenter characterizes wildlife disruption as a false concern by the Forest Service that |

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| | may or may not be an element of the Interdisciplinary Team process. However, disturbance to wildlife has been a concern expressed by agencies, advocates, and private individuals interested in big game management. This analysis uses the best available science to determine effects.<br><br>Commencing on page 268 of the DEIS is the *Effects of Motorized Vehicle Access to Big Game* followed by a section *Off-road Recreations Effects* that has several detailed and cited scientific studies and papers. "The only studies at this time that have examined elk response to modes of off-road recreation were done at Starkey in northeastern Oregon (Wisdom et al. 2004; Naylor et al. 2009). Wisdom et al. (2004) measured responses by mule deer and elk to four off-road recreation activities including hiking, mountain biking, horse riding, and ATV riding. The distance deer and elk moved and movement rates were measured in response to the activity and during control periods where no recreational activity was permitted. Mule deer responses contrasted sharply with elk." |
| **13-3** | ***Why can't I ride down a stream and enjoy its beauty? Mother Nature during the winter causes significant run off far more than what I believe an ATV does. I'm not asking to ride through a stream, but let us ride up to it in a controlled manner.***<br><br>Response: All action alternatives maintain a level of motor vehicle access along the rivers within the project area. Although a considerable amount of motorized use has been moved away from water, up to 54 miles of road and trail within the Riparian Reserve remains open in the action alternatives. Table 102 of page 347 in the FEIS displays the miles of roads and trails in the Riparian Reserve by alternative.<br><br>The Three Trails OHV project would generally reduce the number of direct motorized accesses to streams and riparian areas for greater protection from potential water quality degradation. Staging and parking areas were designed to handle the current number of vehicles using the area (for all pursuits) plus projected growth associated with motorized recreation. Anybody can use these areas, or access the river and riparian areas; however they may have to park and walk a short distance. |
| **13-4** | ***Several times this report mentions moving trails away from residential areas. Out of curiosity which came first trails or the homes?***<br><br>Response: Respectfully, the Forest Service does not want to speculate on this answer; trails and homes are here now and that situation is being addressed by the the Purpose and Need. |
| **13-5** | ***Your report mentions one forest fire started by a motorcycle. Is that truly worthy of mentioning and is it factual? If so what was the detail?***<br><br>Response: On the Crescent Ranger District, 52 percent of fires are contributed to lightning; the remaining 48 percent are attributed to humans. These human fires include but are not limited to; railroad, arson, smoking, and escaped campfires (Forest fire records from 2004-2008). There is one known fire caused by the use of an OHV on Muttonchop Butte in the last 15 years. This incident was a direct result of an ATV operating on a steep slope while riding a trail system and rolling over and in turn igniting the ground fuel (DEIS page 404). What this shows, is that OHVs are not a significant statistical cause of for wildfires in the project area. |
| **13-6** | ***On page 54, you have a chart of species, buffer zones, and restricted seasons. Many years ago we closed a lot of land due to a concern of the spotted owl. Has it been shown that this action resulted in no change to the species growth? What are the statistics which back up these action points?*** |

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| | Response: The Threatened, Endangered, and Sensitive Species restricted seasons and buffer zones were determined by the 1990 Deschutes Land and Resource Management Plan and the 2010-2013 Joint Aquatic and Terrestrial Programmatic Biological Assessment. A detailed discussion on the Northern Spotted Owl commences on page 160 in Chapter 3 of the DEIS. |
| **13-7** | ***Pages 57 and 58 discuss effectiveness ratings. I again ask what is your statistical back up to prove these are valid issues?***<br><br>On page 58 of the FEIS, the effectiveness of each measure is rated at high, moderate, or low to provide a qualitative assessment of how effective the practice would be in preventing or reducing resource impacts. These mitigation measures and design elements are considered in the effects discussions of Chapter 3. Effectiveness ratings of High, Moderate, or Low are based on the following criteria: a) Literature and Research, b) Administrative Studies (local or within similar ecosystem), c) Experience (judgment of qualified personnel by education and/or experience, d) Fact (obvious by reasoned, logical, response).<br><br>***High****:* Practice is highly effective (greater than 90 percent), meets one or more of the rating criteria, and documentation is available.<br><br>***Moderate****:* Documentation shows that practice is 75 to 90 percent effective; or logic indicates that practice is highly effective, but there is no documentation. Implementation and effectiveness of this practice needs to be monitored and the practice would be modified if necessary to achieve the mitigation objective.<br><br>***Low****:* Effectiveness is unknown or unverified, and there is little or no documentation; or applied logic is uncertain and practice is estimated to be less than 60 percent effective. This practice is speculative and needs both effectiveness and validation monitoring.<br><br>For example, under soil quality:<br>"During trail layout and prior to trail construction, where trail designation overlaps a former timber sale unit that has been completed within the last 20 years, it would be monitored for meeting soil quality Standards and Guidelines. If the unit is found to be below 80 percent in a productive state, avoidance or restoration activities would be utilized. In the area of overlap area, the objective is for the combination of the trail and the unit to be consistent with Regional policies and Forest wide Standards and Guidelines for soil quality. *High"*<br><br>Page 147 of the FEIS cites ample monitoring and science to back up the efficacy and reliability of that measure. |
| **Letter #14** | **Oregon Department of Fish and Wildlife** |
| **14-1** | ***…we still believe a forest-wide comprehensive travel management plan is needed to fully understand the consequences of any of the site specific OHV system plans currently in the NEPA process. Likewise, prior to a final Record of Decision (ROD) for the 2009 Deschutes and Ochoco National Forest Travel Management Draft Environmental Impact Statement (TM DEIS), it will be hard for the Department to understand the juxtaposition of the TT[Three Trails] DEIS plan with the TM DEIS ROD. Moreover, we would like to see the TT DEIS findings for fish and wildlife impacts and/or benefits and related*** |

***recreational opportunity to be consistent with the TM DEIS ROD.***

Response: We will further clarify in the FEIS (pages 24, 25, 33, 36, and 70) the distinction between the Deschutes, Ochoco National Forests and Crooked River National Grassland Travel Management EIS and Three Trails OHV EIS. The Forest recognizes ODFW's previously stated position and beliefs regarding the completion of a forest-wide comprehensive "travel management plan" that specifically addresses road densities. The Forest Service disagrees that the effects of specific projects cannot be understood absent such an analysis.

The Deschutes and Ochoco National Forest and Crooked River National Grassland Travel Management (Travel Management) Draft Environmental Impact Statement proposes the following actions:

- Prohibiting motorized access off of existing open designated routes and areas
- Establishing modified conditions for motorized access for dispersed camping within 300' of existing open designated roads
- Changing some motorized mixed use roads to highway legal vehicles only
- Designating some rock and cinder pits as open to cross-country travel

The range of alternatives considered in the Travel Management DEIS focuses on the specific modifications for the conditions for motorized access for dispersed camping. The DEIS does not propose to designate as open any closed roads, close any currently open designated roads, designate any new motorized trails, or close any existing designated motorized trials.

Since a Final Environmental Impact Statement and ROD have not yet been completed, the Three Trails OHV DEIS proposes under all of the action alternatives to prohibit motorized access off of designated routes within the project area. It proposes to designate the Black Rock and Muttonchop Butte cinder pits as open to cross-country travel. These actions are overlapping and consistent with the proposed actions in the Travel Management DEIS, and would be consistent with the beneficial effects to fish and wildlife identified in that DEIS.

The Three Trails OHV Environmental Impact Statement also proposes to add various miles of designated motorized trails, close a variety of currently open designated roads and to change some roads which only allow highway legal vehicles to motorized mixed use, and designate use in the Muttonchop and Black Rock pits for the designated trail system, depending upon which alternative is selected. The effects on fish and wildlife of these actions are fully analyzed in the appropriate context in the Three Trails OHV DEIS and FEIS.

Although these changed conditions will affect the status of the existing condition of the amount of area open to cross-country travel, the miles of existing open designated roads and motorized trails, and the associated amount of area that would allow for motorized access for dispersed camping that were considered in the Travel Management DEIS, in accordance with 40 CFR 1506.1(2), none of the actions proposed in the Three Trails OHV DEIS/FEIS would limit the choice of reasonable alternatives being considered in the Deschutes and Ochoco National Forests and Crooked River National Grassland Travel Management DEIS.

The effects to fish and wildlife are disclosed in the DEIS on pages 148-346 of the DEIS, including

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| | cumulative impacts that incorporate the Travel Management DEIS where this is an additive effect. Page 153-158 of the DEIS describes the assumptions used for the wildlife analysis including closed, open and high use areas. The Three Trails OHV Project closes all cross-country travel within the project area; therefore the analysis was measured on disturbed/undisturbed habitat (only) on those roads and trails that are open to the public for motorized travel. In the Fisheries portion of Chapter 3, the Travel Management DEIS was acknowledged on pages 334 and 342.<br><br>Recreation opportunities associated with fish and wildlife (assumed to be fishing, hunting, and wildlife viewing) are discussed in detail in Chapter 3 in the Recreation section (DEIS 74-125) as well as in the Social and Economic section (DEIS 423-431). These effects include cumulative additive effects associated with the Travel Management DEIS, if present. |
| **14-2** | ***Stating that all TT[Three Trails] DEIS action alternatives will be consistent with the TM [Travel Management] DEIS ROD (pg 33) seems to be "pre-decisional" thereby basing the TT DEIS action alternatives on predetermined conclusions. A <u>suggested</u> approach would be to defer the TT DEIS until the TM DEIS ROD is finalized, thereby making the ROD resulting travel management conditions the No Action Alternative, or to include another alternative that would reflect the anticipated TM DEIS ROD travel management conditions that the TT DEIS action alternatives could be assessed against.***<br><br>Response: The commenter has misstated references to a ROD for the Travel Management DEIS in the Three Trails OHV DEIS. The Travel Management Draft Environmental Impact Statement does not include a Record of Decision (ROD), and the Three Trails OHV DEIS never referenced such a document.<br><br>The FEIS (pg 36) has been corrected to read, "Within the Three Trails OHV project area, all motorized travel off roads and trails that are designated for use, is prohibited." See also response to 14-1. This condition is part of the proposed action, and reflects the direction of the portions of the Travel Management Rule that relate to the designation of roads, trails and areas {36 CFR 212.55 (a) and (b)}. The No Action Alternative – mandated by the CEQ regulations (40 CFR 1502.14) correctly reflects the existing condition at this time related to cross-country travel. The Three Trails OHV Project does not rely or depend upon the Travel Management Environmental Impact Statement' proposed action, nor does it limit the range of alternatives being considered in that DEIS. The timing of the release of the Travel Management Environmental Impact Statement is beyond the scope of this Environmental Impact Statement. The cumulative effects of reasonably foreseeable future actions, including the Preferred Alternative identified in the Travel Management Environmental Impact Statement, are considered in the cumulative effects sections where appropriate in the Three Trails OHV DEIS/FEIS.<br><br>Pages 31-32 of the DEIS describe an alternative considered that does not provide for a trail system, but utilizes existing roads only, similar to the action alternatives described under the Travel Management DEIS. The rationale for eliminating this alternative from detailed study is provided in those pages. Additionally, 36 CFR 220.5(e) states "An action alternative should meet the purpose and need and address one or more significant issues related to the proposed action." Adding an alternative that would reflect the anticipated implementation of the Travel Management Rule Project would not meet the Purpose and Need (DEIS, page 22) as it would not provide for a designated trail system. |
| **14-3** | ***Additionally, the TT DEIS states that all action alternatives will be consistent with the imminent TM DEIS ROD (pg 33), yet it doesn't include the No Action Alternative. Does this mean if the TT DEIS No Action Alternative is chosen it will supersede the TM DEIS ROD, thereby retaining existing conditions within the project boundary (i.e., cross-country travel, user created trails, etc)? The Department*** |

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| | ***<u>requests</u> the TT DEIS provide a clear understanding of the relationship between the imminent TM DEIS ROD and the TT DEIS No Action Alternative.***<br><br>Response: See responses to 14-1 and 14-2 regarding references to the Travel Management DEIS ROD and the No Action Alternative. If selected, the No Action Alternative would not change any existing motorized access within the project area. Selection of the No Action Alternative would not preclude future actions regarding motorized access from being taken. |
| **14-4** | ***The TT DEIS No Action Alternative describes many existing conditions that by way of the imminent TM DEIS ROD are proposed to be rectified: cross-country travel, user created trails, motorized use of closed level 1 roads, a transportation system that is unenforceable, etc. By not tying the TT DEIS to the TM DEIS ROD, the outcomes of the TT DEIS seem to over-state the benefits the action alternatives provide to offset ongoing impacts to forest resources in particular wildlife resources, while over-stating projected impacts to OHV users. In reality, the TM DEIS ROD could be the best alternative for fish and wildlife resources and recreational opportunity. An example of this potential outcome is a combination of Tables 107 & 109 (pg 386 & 389) that show 8 to 11 out of 16 sub-watersheds for the TT DEIS action alternatives (roads + trails) exceed the anticipated TM DEIS ROD road density (Appendix A). Likewise, 12 to 13 of the subwatersheds exceed 2.5 miles per square mile as a result of the TT DEIS action alternatives versus 11 for the anticipated TM DEIS ROD road density (Appendix B). Tied to this example is the recognition that the TT DEIS project area only encompasses 40% of the 16 subwatersheds used for analysis and that the change in road densities associated with closing roads and adding trails could be misleading. Changes in road and trail densities could be much greater within the project area than what is presented.***<br><br>Response:<br>See responses to 14-1, 14-2, and 14-3 for clarification between the Three Trails OHV Project and Travel Management DEIS.<br><br>The effects of the Three Trails OHV Project alternatives, including cumulative effects associated with the Travel Management DEIS and others, can be found in Chapter 3 of the DEIS. Effects to fish and wildlife (p. 148-346) and recreation (p. 74-125) are described in the DEIS. Additionally, alternatives considered but eliminated from detailed study can be found on pages 59-62 of the DEIS.<br><br>The Three Trails OHV Project DEIS discusses road density and motorized route density in detail in Chapter 3 in both the Big Game section (p. 262-284) and the Transportation section (p. 382-396). In both sections, analysis of road and motorized route density is disclosed in several ways, including roads under Forest Service jurisdiction, those outside the jurisdiction of the Forest Service (including Highways 97 and 58), with and without motorized trails, with and without private lands, and road and user-created trail closures by action alternative.<br><br>Please also see Table 4 and 5 on page 62 in Chapter 2. These tables display the miles of trail to be added by action alternative as well as the miles of user-created trails to be closed and rehabilitated along with miles of roads closed by action alternative. Alternatives C, D, and E all propose to close more miles of roads and user-created trails than miles of OHV trail added by these alternatives (DEIS, Chapter 2, p. 63). Part of the Purpose and Need for this project was to design a reasonable and sustainable trail system that addresses rider's experiences related to the opportunities that are being lost with the eventual implementation of the Travel Management Rule. Part of the decision to be made is to consider all resources, including fish, wildlife, and recreational opportunity and enforcement is an important aspect |

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| | of obtaining compliance with any subset of users of the National Forest System lands. However, having an available and adequate recreation experience is also an important component, in addition to education and monitoring. By providing a trail system that fits "what riders want," it would go a long way to encourage them to stay on the trail. This would be no different than for local woodcutters that need fuel wood, or providing non-motorized experiences such as mountain bike trails. |
| **14-5** | ***If the TT [Three Trails] DEIS action alternatives will cause resource impacts to the anticipated TM [Travel Management] DEIS ROD travel management conditions, then it is important for this information to be clearly presented to the decision maker and our constituents to ensure all interests are aware of the natural resource and recreational tradeoffs proposed for each action alternative. The Department recommends deferring the TT DEIS until the TM DEIS ROD is finalized, thereby making the ROD resulting travel management conditions the No Action Alternative conditions, or to include another alternative that would reflect the anticipated TM DEIS ROD travel management conditions that the TT DEIS action alternatives could be compared to. Taking either approach should help assure that the TT DEIS findings for fish and wildlife impacts and/or benefits and related recreational opportunities are consistent with the TM DEIS ROD.***<br><br>Response: The Forest Service disagrees the the public is better served by delaying the Three Trails OHV Project. We believe we have presented a full disclosure of the natural resource and recreational tradeoffs proposed for each action alternative. The resource impacts for all alternatives and resources, along with cumulative effects that include the Travel Management Project are disclosed in Chapter 3 of the DEIS.<br><br>Please see response to 14-1 and 14-2 regarding timing for the Three Trails OHV Project and the Travel Management DEIS, alternatives or analyses associated with travel management conditions, and consistency with the Travel Management DEIS. |
| **14-6** | ***Foreseeable actions are listed, yet few project findings are correlated with foreseeable actions. As an example, the Rim Paunina EIS (pg 71) proposes vegetation manipulation that will likely significantly reduce big game hiding cover within 660 feet of roads, particularly in ponderosa pine plant associations and along roads identified as safety corridors, yet the TT DEIS shows hiding cover to occur on 63% to 69% of the land within 660 feet of a road (pg 267). As presented to the Rim Paunina EIS collaborative group, within five years of implementation of the Rim Paunina project this figure will likely be altered significantly. The Department recommends information be provided (i.e., table form) to better describe the relationship between this project and other foreseeable actions that will likely significantly alter values presented in the TT DEIS.***<br><br>Response: Page 283 of the DEIS acknowledges the planned vegetation activities in Rim-Paunina, concluding the activities would likely result in a reduction of hiding cover and short-term disturbance. The analysis for the Rim-Paunina project is not complete; therefore specific details on the amount of hiding cover by action alternative are not available at this time. The Three Trails OHV Project has disclosed Reasonably Foreseeable Actions as detailed as possible.<br><br>Pages 67-68 of the DEIS describe the approach and regulatory guidance associated with cumulative effects including past, present, and foreseeable actions. Direct references to the Rim-Paunina Project as a foreseeable action are found in Wildlife cumulative effects sections (DEIS pages 213, 216, 224, 241, 245, 248, 250, 253, 257, 283, 288, 294, and 311). Please see the table on pages 69-72 of the DEIS for past, present, and foreseeable projects that may cumulatively affect resources associated with the |

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| | Three Trails OHV Project and the remainder of Chapter 3 for those cumulative effects. |
| **14-7** | ***Following the extensive OHV section, summarized information is presented for all user participation on the DNF that includes percentage figures for individual user group (pg 76). Unfortunately, this information lacks details on how these groups use the TT DEIS area or the DNF. Included in the information is a subset of six groups projected to increase most rapidly in the future (pg 89). Information presented shows that a small percent (2.1%) of all DNF participants take part in OHV activities (pg 76). It also identifies activities with the greatest growth in the next 10 years to be viewing/photographing wildlife/birds (wildlife viewing) (25.1%)[77], general relaxing (33.8%)[1], viewing other features (43.3%)[1], hiking/walking (40.6%)[1], fishing (16.1%)[1], and driving for pleasure (14.4%)[1]. This is all helpful information; however what's missing is a clear assessment and discussion about the tradeoffs between present and future OHV and non-OHV activities and participants by alternative within the project boundary. Of particular interest to the Department are the tradeoffs between proposed OHV activities and the identified growth for wildlife viewing and fishing activities.***<br><br>Response: The limitations of the NVUM and NSRE data are disclosed on page 76, including that the NVUM data "is a broadscale look and not necessarily good at site-specific information" (DEIS, p. 76) and "NSRE may not reflect local use" (DEIS, p. 76).<br><br>Page 75 of the DEIS discusses various sources of information regarding motorized and non-motorized activity and it reveals contradictory data wherever known. The statement was a conclusion of the 2005 NSRE data. The analysis correctly discusses the difference in the reliability of both NSRE and NVUM data on the same page (76) of the DEIS. NSRE may not reflect local use (as NVUM data), but it does reflect national data from a larger and more frequent sample with greater confidence. The Forest Service regrets any confusion this may have caused and the complete citation will appear in the FEIS.<br><br>Discussion of effects to recreational uses are discussed in the Recreation section of Chapter 3 (DEIS 74-125). Existing use is described in the existing condition on pages 79-88, including motorized and non-motorized uses. On page 80, the existing condition incorporates the activities you are concerned about. Pages 85 and 86 describe how the project area is currently being used, which is information that cannot be gleaned from either NSRE or NVUM data.<br><br>Additionally, page 74 describes why the Recreation section was not organized with a motorized vs. non-motorized approach: "nearly all Forest visitors use vehicles to get to their preferred activities and settings, whether it is hiking or equestrian trailhead, a fishing spot, or a favorite campsite." Effects to quiet recreation are addressed on pages 105-106, including bird watching and fishing. Pages 118-123 also address effects to Wild and Scenic Rivers, including wildlife viewing and fishing. |
| **14-8** | ***Given the economic and recreational value of fishing, hunting, and wildlife viewing, mostly presented in Table 77 (pg 262), along with the predicted growth of wildlife viewing and fishing (pg 89), a better assessment and discussion of findings is needed to understand how each TT [Three Trails] DEIS Alternative will impact/benefit current and projected fish and wildlife recreational activities and participation. Likewise, a clear projection of the annual OHV growth for the No Action Alternative (dispersed OHV recreation) versus the annual OHV growth for any of the Action Alternatives (developed OHV destination) is needed to better understand the potential conflicts by these different alternatives with natural resources and other non-OHV activities and participants over time. The*** |

[77] Percentages are for current participation use figures

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| | ***Department <u>recommends</u> an assessment and discussion of the findings be conducted by alternative to provide an understanding of the tradeoffs between current and projected OHV and non-OHV activities and participation with emphasis on the six activities with greatest growth including wildlife viewing and fishing.***<br><br>Response: Page 75 of the DEIS explains the methodology for predicting trends for OHV use in the project area. Please see response to 14-7 for effects to recreational activities, including fishing and wildlife viewing. See also page 86 of the DEIS, which states "both use by and values associated with, non-motorized use and quiet recreation overlapping the Three Trails OHV project are low to non-existent during the summertime. Most non-motorized trails on the Crescent Ranger District are located outside the project area." Effects to hunting are addressed in both the Recreation and Big Game sections of Chapter 3.<br><br>OHV growth for the No Action Alternative is described in Chapter 2, on page 31: "It is estimated the user-created trail system expands at least two to five miles on a yearly basis until the Travel Management Project is implemented." Predicted OHV use for the action alternatives is described in the Recreation section of Chapter 3 on Pages 91-92 along with rationale for the assumption in growth.<br><br>All forms of recreation in the area generally use a motor vehicle to access the area (page 74, DEIS). Designation of a motorized trail system would further separate uses and provide areas for quiet recreation (DEIS, page 448). For those uses that may overlap, such as hunting, fishing, and OHV use, staging and parking areas are located a short distance away and provide portals for those activities. The Three Trails OHV project would generally reduce the number of direct motorized accesses to streams and riparian areas for greater protection from potential water quality degradation. Staging and parking areas were designed to handle the current number of vehicles using the area (for all pursuits) plus projected growth associated with motorized recreation. Anybody can use these areas, or access the river and riparian areas; however they may have to park and walk a short distance. |
| **14-9** | ***… given the importance of riparian and wetland areas for fish and wildlife habitats, species, and associated current and projected recreational opportunities; along with their scarcity within the project boundary let alone the DNF; the Department <u>recommends</u> closing most[78] OHV activity within 0.89 miles (pg 103) of riparian and wetland areas to further meet conservation of fish and wildlife resources and projected recreational desires. This action could provide noise free recreational opportunities for most of the rapidly growing activities on the forest (pg 89).***<br><br>Response: The Responsible Official is finding a balance for both motorized and non-motorized pursuits, while protecting resources. Prohibiting OHV activity within 0.89 miles of all riparian and wetland areas does not meet this balance, especially on shared use roads within 0.89 miles of riparian areas where there are all forms of motorized and non-motorized activity already occurring.<br><br>The importance of riparian and wetland areas was incorporated into not only the effects of the Three Trails OHV Project, but its' purpose and need (DEIS, p. 22) and alternatives (DEIS, Summary, p. V-VIII, DEIS, Chapter 2, p. 34-51). Additionally, resource protection measures were included to protect riparian and wet areas (DEIS, Chapter 2, p. 54-55). See also Chapter 3 effects on Wild and Scenic River (DEIS, Chapter 3, p. 119-124) and Soil Quality, Wildlife, and Aquatic Resources (p. 126-295, 320-349). As stated on page 320: "In summary, there are potential beneficial effects to fisheries from implementation of the |

[78] Such as 99% with some end point OHV access to a small portion of open water areas.

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| | action alternatives. Moving use away from water and restoration activities result in decreases in potential for sediment delivery. Increases in vegetative recovery also improve bank stability and provide a very small increase in vegetative cover to intercept solar radiation (shade)." Based upon the analysis, project design, and resource protection measures, the Three Trails OHV Project strives to provide the best balance between access for recreation activities associated with riparian and wetland areas and protection of resource areas. One example is that Alternatives C, D, and E include a associated action of creating a non-motorized trail to a popular access to the Little Deschutes River that is currently highly used by motorized vehicles of all types (DEIS, p. 40, 44, and 48). |
| **14-10** | ***If OHV participants are predicted to increase annually between 2.5% to 5.6% (49% to 72% in 10 years) (pg 92), then participation for the most rapidly growing recreational pursuits should increase even faster. This could result in current user destinations reaching capacity in the near future with a need to develop and provide opportunities elsewhere on the DNF, particularly in areas near water. As an example, both the Little Deschutes and Crescent Creek support native and nonnative salmonids that provide recreational opportunity. Stream fishing opportunities are limited south of Bend and the Three Trails area provides an opportunity for anglers to pursue their trade away from the more popular parts of the Crescent Ranger District. Given the projected increase in anglers, the Department expects this fishery to be of increasing importance overtime.***<br><br>***<u>Information is needed</u> that describes how implementation of any of the TT DEIS Action Alternatives will affect the ability to provide for these increasing non-OHV recreational activities now and into the future, particularly for fish and wildlife related activities.***<br><br>Response: Please see responses to 14-7, 14-8, and 14-9.<br>The analysis concluded the Outstandingly Remarkable Values were protected for both the Little Deschutes and Crescent Creek rivers (page 121, DEIS) in all action alternatives. The analysis also showed the designation of trails was more than offset by the miles of closures for both roads and user-created trails that would be rehabilitated.<br><br>At Crescent Creek Campground, which is a popular birding destination, only Alternative C utilizes it for a staging area. Otherwise, the Crescent Wild and Scenic River would remain a relatively quiet experience except for the nearby traffic associated with County Road 61 (Crescent cut-off) (page 118, DEIS). |
| **14-11** | ***After the extensive TT[Three Trails] DEIS planning process, no clear rationale was presented as to why 8 to 10 (depending on TT DEIS Action Alternative) of the 16 sub watersheds have remaining road and OHV trail densities greater than 2.5 miles/ mile$^2$ (pg 267 & 273).***<br><br>***… The Department <u>requests</u> a clear discussion be presented explaining why as a result of the extensive TT DEIS planning process that the 2.5 miles per square mile target road density (LRMP 4-58) wasn't met for 5 to 8 of the 16 sub-watersheds analyzed (pg 267), with an even greater number 8 to 10 sub-watersheds out of 16 being over 2.5 miles per square mile when a developed OHV System is added (pg 273).***<br><br>Response: The commenter is referring to Forest Plan direction for wildlife (WL-53) for road densities within watersheds. As such, WL-53 was specifically worded as a target to allow for other forest uses in addition to providing habitat for mule deer. When target road densities are over 2.5 miles per square mile, then an additional analysis is required. Following this "further analysis," the DEIS disclosed an |

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| | overall net benefit to deer habitat (page 282, DEIS).<br><br>Road densities outside of Forest Service jurisdiction can make up a large portion of a total road density within a watershed. However, if the target road density within Forest Service jurisdiction is over the target of 2.5 miles per square mile, there can be several reasons. Roads that provide access to private lands, County, and State roads (Highways 58 and 97, County Road 61) can make up a significant portion of road densities, depending upon how much they overlap into a particular watershed. Many roads are usually not available for closure, as well as other roads that provide access for recreation, suppression, and other resource management. The Three Trails OHV project has identified the minimum road system on the 93,016 acres that encompasses theThree Trails OHV project area.<br><br>In addition, identification of the minimum road system is consistent with a product of the Mule Deer Working Group sponsored by the Western Association of Fish and Wildlife Agencies. Specifically, the working group recommended the following, which have been incorporated:<br>• Develop consistent regulations for OHV use.<br>• Develop and maintain interagency coordination in enforcement of OHV regulations.<br>• Designate specific areas and times (seasonal use restrictions) for activities such as OHV use that disturb habitat or deer.<br>• Cluster recreational activities to maintain or create large blocks of undisturbed habitat. Direct new development toward previously disturbed areas (clumped rather than dispersed distribution).<br>• Seasonally separate humans and mule deer at critical periods.<br>• Through education, modify human behaviors to reduce recreational effects in mule deer.<br>• Monitor activities that may unduly stress deer at important times of the year. Reduce or regulate disturbance if deemed detrimental. When applicable, encourage enforcement of regulations regarding dogs running at large or chasing wildlife and wildlife harassment by snowmobiles and OHVs.<br><br>Road and OHV trail densities and effects to Wildlife are displayed on Table 82 and 83 (DEIS p. 272-273). They provide a look at road and trail densities respective to wildlife concerns (LRMP WL-53) and the 2.5 miles per square mile target road density. The densities by subwatershed in Tables 82 and 83 display motorized route density on Deschutes National Forest lands only (DEIS, p. 272). The total road density across the National Forest portion of the 16 subwatersheds is between 1.9 and 2.2 miles per square mile for the action alternatives compared with 3.8 for the No Action alternative. When OHV trails proposed are added to this, the action alternatives have between 2.5 to 2.8 miles of motorized routes per square mile compared with 4.3 for the No Action alternative (DEIS, p. 273). |
| **14-12** | ***Very little monitoring is identified to determine project success or modification needs to meet project objectives. No ecological or social thresholds are established, no future project reviews are proposed, no assessment of a user's recreational experience is suggested, no assessment is proposed to determine if OHV users displace other users (i.e., along water bodies), etc. (pg 58). In light of potential conflicts with the rapidly growing non-OHV recreational activities (pg 89), the low percentage of OHV participants out of all forest participants (pg 76/77), and the total forest landscape affected by OHV activities outside of wilderness areas (88% of the DNF 2009 TM DEIS pg 218), the Department <u>recommends</u> a clear monitoring plan be developed that includes the themes identified above to ensure project and more expansive DNF objectives are met over time.*** |

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| | Response: A monitoring plan is found on page 58 of the DEIS; more specific elements and thresholds can be developed in conjunction with the Provincial Advisory Committee working group, which is currently working on monitoring elements once the Travel Management FEIS and ROD is implemented. It would employ a three stage approach:<br>1. Gauging compliance with user-created and designated motorized trail systems;<br>2. Recovery of selected areas once motorized access is controlled; Three Trails OHV Project has tentatively identified two areas where rehab efforts are planned; and<br>3. Communication with users to obtain feedback |
| **Letter #15** | **Larry Ulrich** |
| **15-1** | ***I prefer Alternative E. Still not as many trail miles as I would prefer, but at least you have included some single track motorcycle trails. I'm glad that all of the Level 2 roads will remain open to OHVs. I'm hoping that in the near future, you will be able to connect to the Winema National Forest.***<br><br>Response: Many of the Maintenance Level 2 roads remain open and available to non-licensed vehicles, in addition to those that are part of the designated system. However, some Maintenance Level 2 roads would be closed to offset trail creation and to keep the road/trail densities down in the respective watersheds. The Fremont/Winema and Crescent Ranger District staffs have been working together on coordinating existing connections. |
| **Letter #16** | **Ron Grace** |
| **16-1** | ***To make this a sustainable trail system more loops with several connectors will be needed. The most commented on part of the Travel Management Plan indicated that what is wanted in Central Oregon is single track trail. This plan does not address that need. No one way trails.***<br><br>Response: The Forest Service will collaborate with the riders of all classes of vehicles to get input on how best to design the trail system within the parameters of the decision being made. |
| **Letter #17** | **Curtis Dorn** |
| **17-1** | ***I would like to see some of the trail dedicated as single track as this type of trail, done properly, requires less maintenance.***<br><br>Response: See response 16-1. |
| **Letter #18** | **Peter Mayer** |
| **18-1** | ***Alternative E has my vote and support.***<br><br>Response: No response is necessary |
| **Letter #19** | **Randy Drake** |
| **19-1** | ***Alternative C is our [Deschutes County 4 Wheelers] preferred alternative with the modifications discussed in these comments. This alternative provides for additional OHV Class II trails in the Black Rock Pit area, as well as additional trails in the northern Walker segment. Access to the Boundary*** |

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| | ***Springs campground is also provided by this alternative.***<br><br>Response: No response necessary. |
| **19-2** | ***…none of the Walker alternatives propose anything but existing graded roads. We cannot stress enough the importance of obliterating existing roads and constructing trail elements (listed in the letter). If the Crescent Ranger District's intention are to simply post signs designating existing roads as trails without significant trail enhancement, …, this project will be a complete failure as far as the Class II 4x4 user is concerned.***<br><br>Response: There are opportunities to work with the Class II users and design the available trail system to provide challenges within the prism of the roads and trails that were analyzed. Roads being converted to trails would be on a site specific basis. Realignment may occur to protect adjacent resources. Forest Service Handbook (FSH) 2309.18 Trails Management Handbook will be used to define levels of trail difficulty and trail design elements. |
| **19-3** | ***The travel management rule and the travel management directives allow the responsible official discretion to designate user-created and/or non-system routes such as skidder roads (36 CFR 212, FSM 7715.78 and FSH 7709.55). There are numerous existing skidder roads in the Walker segment which would provide unique and desirable trail obstacles for the Class II user. We strongly urge the Forest Service to provide Class II trails on something other than a Maintenance Level 2 road.***<br><br>Response: Walker Rim was more difficult in finding a balance between a motorized trail system and other resource considerations than the other two segments. An alternative was considered but eliminated from detailed consideration on page 60 of the DEIS that cited the fragile nature of the soil along the rim, the steepness of the terrain, the scenic visual component from Highway 97, and a main migration route as well as fawning/calving area for mule deer. Also see Response 19-2. |
| **19-4** | ***The majority of the readers will not know the difference between the three classes of OHV. The reader clearly will not understand that when a mileage figure of OHV trails is given, that each OHV class mileage is different. This document must clearly provide the differences whenever OHV miles are given. In order to be a factually based document, Class II trail mileage must be broken out each and every time that OHV trail mileage is given, as the miles are not equal. …It is extremely inaccurate and misleading to quote a figure of 100-130 miles of trails [Purpose and Need page 22] when the mileage which will be available for OHV Class II users is only 15-26 miles.***<br><br>Response: It is acknowledged that the Class II trail miles are not equal. Class II opportunities are most clearly specified by alternative in Table 4, page 63 of the DEIS. Tables 26 and 27 on pages 96 and 97 also assign values by class of vehicles. Further in the Recreation section is an analysis of effects to the Class II user. An appropriate level of detail is provided for the subject matter discussed. |
| **19-5** | ***The Three Trails OHV Project DEIS provides analysis concerning the possible effects of motorized recreation; however, this document completely fails to analyze the impacts of humans on foot. It these proposed trails will be open to both motorized and non-motorized users, then all of the impacts must be analyzed in the DEIS, not just those associated with the motorized users. If only the impacts of the motorized community are analyzed, then the trails must be open only to motorized users.*** |

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| | Response: The DEIS/FEIS analyzes the effects of uses of the designated trail system on both motorized and non-motorized trail users in accordance with NEPA regulations. (Ref Chap 3, Recreation). The designated motorized trail system would be open to hikers, mountain bikers, and equestrians if they choose to use the trails.<br><br>There is no documented evidence of conflicts between motor vehicle uses and other recreational uses on the Crescent Ranger District. The assumption is that the Ranger District is not as visited as nearby Ranger Districts, thereby there is ample room for most activities. Designation of a motorized trail system would further separate uses and provide areas for quiet recreation. Reference Chapter 3 for a discussion on the types of uses that occur on the Ranger District and how they are affected by this project (DEIS, page 448). A considerable portion of the analysis is dedicated to non-motorized experiences and the analysis determined both types of recreation benefit from designated motorized trails. The analysis also assumes the greatest potential for conflict exists on the Metolius-Windigo trail in the Junction segment. A key issue and Project Design Features were developed to respond to the shared use of the Metolius-Windigo trail.<br><br>Especially on the Crescent Ranger District, a separation of motorized and non-motorized opportunities exists and a high quality experience can be found for both users (DEIS, Recreation). A considerable portion of the analysis is dedicated to non-motorized experiences and the analysis essentially determined both types of recreation benefit by designating a motorized trail system. The analysis also assumes the greatest potential for conflict exists on the Metolius-Windigo trail in the Junction segment. A key issue and Project Design Features were developed to respond to this potential conflict. |
| **19-6** | ***It must be clearly stated that unrestricted cross country travel is currently legal in most areas of the forest. Although Maintenance Level 1 roads are not considered "open", they are legal for use under the current status of "unrestricted cross country travel". OHV enthusiasts often use these ML 1 roads because they provide a desirable experience without causing resource damage and their use does not increase the mileage of user-created trails.***<br><br>***The phrase "non-authorized use from motorized travel (primary OHVs)" inaccurately infers unlawful behavior.***<br><br>Response: This definition has been corrected in the FEIS, page 135. There is resource damage occurring on the roads attributable to OHV use which constitutes unauthorized use. It is a violation of CFR CFR 261.12c or CFR 261.15h.<br><br>The commenter has mischaracterized the nature of how cross-country travel is currently allowed on the Deschutes National Forest. This is most accurately captured in the Deschutes and Ochoco Travel Management Project Draft Environmental Impact Statement, Chapter 2. In summary, there is a mixture of prohibitions and restrictions across the forest. However, even where cross-country travel is allowed, there is still a requirement or "restriction" that cross-country travel be conducted without damage to National Forest resources. |
| **19-7** | ***This DEIS proposes a season of use from May 1 to October 31. Throughout the Deschutes National Forest, winter OHV closures are from December 1 to March 31. Adopting a different closure season than the rest of the forest will create confusion for the OHV community. We recommend that the season of closure be revised to match that of the rest of the forest.*** |

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| | Response: A Project Design Feature was included for all action alternatives that would provide for a general season of use from May through October in order to "maintain soil quality and to ensure maintenance of a quality trail riding experience for the users a general season of use would normally be from May 01- Oct 31" (DEIS, page 54). This would be a site specific condition assessed at the start and end of each season of use based on snow levels and trail conditions. To lengthen or shorten this time would be the District Ranger's determination and communicated to the public through the central Oregon website, posting at staging areas, and personal contact. |
| **19-8** | ***…OHV Class II users enjoy the forest year-round. Our vehicles are capable of over-the-snow travel and we regularly use forest roads and trails with or without snow. Throughout the Deschutes National Forest, OHV Class II users are allowed on forest roads and trails as long as there is not a designated snow-mobile trail. We highly recommend that the OHV Class II trails in the Walker and Junction segments be designated as open for year round use.***<br><br>Response: See response 19-7 |
| **19-9** | ***…the Walker segment is proposed for additional closures, particularly in Alternative C. A spring fawning closure is proposed for an additional six weeks until June 15th, as well as a Green Dot closure for two weeks in the mule deer rifle season. These additional closures reduce the available OHV season by eight weeks to just twenty weeks. This short season coupled with the additional closures in the Walker segment are guaranteed to create confusion and enforcement issues.***<br><br>Response: The Forest Service has a cooperative agreement with the Oregon Department of Fish and Wildlife to ensure that the Walker Green Dot Cooperative Road Closure Agreement, which is a seasonal closure, would be in effect for the entire Walker Trail system for two weeks during the mule deer rifle season. However, those roads within the "green dot system" that have a green dot, which is designed to reduce big game harassment during hunting season, would remain open to all motor vehicles (DEIS p.37). This agreement has been around and been effective for several years and is well known to locals. In addition, it would be marked on the designated trail system map and the Motor Vehicle Use Map to reduce confusion by non-local riders who travel here to ride.<br><br>There is a monitoring and enforcement design feature (DEIS page 59) for wildlife "Ongoing monitoring and enforcement of big game hunting regulations occurs with partnership of Oregon Department of Wildlife, Oregon State Police and the US Forest Service. The focus is during hunting season and emphasizes patrols within the green dot closure area at Walker Mountain."<br><br>Because Alternative C proposed a more extensive trail system in the Walker area, mitigation measures were developed to lessen mule deer effects during the spring migration period (DEIS page 54). |
| **19-10** | ***Page 33 of 520 states: "All trail locations are approximate and effects are based on the location moving 200 feet from centerline either side to avoid trees or other obstacles. The exception would be when a trail is on a road prism or adjacent to a sensitive area such as a cultural site or fen. …"***<br><br>***It must be noted that all trail mileage for OHV Class II users is on a road prism. This would eliminate any possibility of utilizing any trail obstacles located along the trail. We highly recommend that this unfair limitation be removed for the OHV Class II trails.***<br><br>Response: There are up to 11 miles of road converted to trail for Class II vehicles that provides |

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| | opportunities for installing obstacles. Obstacles located along the road prism *may* be used as a trail obstacle as long as it does not present a resource conflict, such as a cultural site or fen. Roads being converted to trails would be on a site specific basis. Realignment may occur to protect adjacent resources. |
| **19-11** | ***Page 37 of 520 states: While roads maintained for high clearance vehicles would be available to all OHV classes, the southern area would have developed trails for the Class II user."***<br>***How would these trails be developed? The DEIS gives absolutely no details concerning what the Class II trails would include.***<br><br>Response: Following the Record of Decision (ROD), an implementation plan is developed. During that time, there would be opportunities to work with the Class II users and design the available trail system to provide challenges within the prism of the roads and trails that were analyzed. Roads being converted to trails would be on a site specific basis. Realignment may occur to protect adjacent resources. The Forest Service Handbook (FSH) 2309.18 Trails Management Handbook would be used to define levels of trail difficulty and trail design elements. |
| **19-12** | ***We appreciate the inclusion of OHV Class II opportunities in the Junction portion, particularly the access to Black Rock Pit. However, access which is provided on shared use roads cannot be considered as "4-wheel drive opportunities"(DEIS pg. 41)***<br>***Also, the tail elements which will be provided by these 12 miles of "new trail and roads converted to trail specifically engineered for Class II vehicles" must be described. What obstacles are being "engineered"? What is the difficulty rating of the trail?***<br><br>Response: See Response to 19-11. |
| **19-13** | ***Page 44 of 520. Alternative D is a complete waste of the OHV funds generated by the OHV Class II user. We will not waste any more time in these comments concerning this alternative as it does not meet any of our needs or desires. We are entirely opposed to Alternative D.***<br><br>Response: No response is necessary. |
| **19-14** | ***Page 48 of 520. Alternative E is also a complete waste of the OHV funds which have been generated by the OHV Class II community. This alternative is identical to Alternative D in the Walker segment and eliminates key trail mileage and the long loop from the Black Rock Pit area. No analysis or valid reasoning for the elimination of the easterly Black Rock Pit loop is given. Alternative E provides no trail mileage not already on an existing graded road. No existing skidder roads are incorporated; no existing power line ascents are incorporated; no difficult trail obstacles are proposed; and it does not significantly differ from Alternative D from a Class II user's perspective.***<br><br>Response: It is acknowledged Class II users generate part of the OHV funds; however OHV funds are also generated from other classes of OHVs (ATVs, Jeeps and other 4-wheel drive, and motorcycles) via state required stickers and the state gas tax. Each year a percentage (in the form of a lump sum) is given to the Oregon Department of Parks and Recreation. They have an ATV Grant Program that reviews grant applications by a committee made of various members of the OHV community.<br><br>The elimination of the eastern loop was to reduce effects to bat habitat. The reduction in the amount of |

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| | disturbed acres of bat habitat versus undisturbed bat habitat between Alternative E and C is displayed in Table 88 (page 292 of the DEIS).<br><br>Following the Record of Decision (ROD), an implementation plan is developed. During that time, there would be opportunities to work with the Class II users and design the available trail system to provide challenges within the prism of the roads and trails that were analyzed. The Forest Service Handbook (FSH) 2309.18 Trails Management Handbook would be used to define levels of trail difficulty and trail design elements. |
| **19-15** | ***Page 53 of 520.*** **"After consideration of access for activities such as recreation, mushroom harvesting, and administrative use (including fire suppression), approximately 218 miles of legacy roads inherited from a land exchange, formerly used for intensive harvest practices, would be closed to motorized use in the Northeast corner of the Walker segment."**<br>***How could mushroom harvesting and recreation be considered in the closure of 218 miles of roads in the northern Walker segment? According to page 456 of 520, the mushroom harvesting occurs many miles away, generally in the Junction segment between Crescent Lake and the Two Rivers North subdivision. Also, there are no recreation activities such as OHV trails in this area either. The closure of 218 miles of roads and the elimination of the OHV trails from the northern area of the Walker segment cannot be justified based upon the reasons stated. Because NEPA requires a full and fair analysis rather than unsubstantiated statements, these roads and the northern OHV Class11 trails cannot be eliminated without scientific analysis.***<br><br>Response: A minimum road system (36 CFR 212.5(b)) was identified after careful consideration of access. In the Walker segment, there are resources that were considered in the design of the alternatives in addition to rider's satisfaction; they include big game, cultural resources with spiritual sites, soil quality especially on the steeper slopes, and Old Growth Management Areas. |
| **19-16** | ***Page 53 of 520 states: "***There would be no OHV trails constructed that would traverse lava pressure ridges and/or lava flows such as the Black Rock lava flow south of Hamner Butte."<br>***No scientific reason is given for this closure. NEPA requires scientific evaluation and does not allow for unsubstantiated statements.***<br><br>Response: The edges and interior of the 700-acre Black Rock lava provide unique wildlife habitat for bats (DEIS page 289). There is a reduction in the amount of disturbed acres of habitat versus undisturbed between Alternatives E and C (See Table 88 page 292 of the DEIS). Also see Potential Wilderness Consistency starting on page 117 of the DEIS. |
| **19-17** | ***Page 54 of 520 presents:*** Table 2. Seasonal Restrictions on Trail Construction and Maintenance Activities near Active Nest Sites, Wolverine Dens, and Big Game Calving/Fawning Habitat.<br>***According to this table, the buffer distance for deer and elk will be determined at some point in time by a wildlife biologist. However, scientific parameters are not presented; the studies which this biologist will base his decision on are not presented; nor are public comment periods scheduled for his decision. This is clearly and arbitrary and capricious standard lacking a full and fair discussion while ignoring contradictory evidence, all of which are not allowed under NEPA laws.***<br><br>Response: Alternative C proposes a limited OHV operating period within the Walker segment prohibiting use from May 1 through June 15. This period coincides with the spring mule deer migration period and incorporates the majority of the fawning period. This was developed to provide reasonable motorized |

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| | access while balancing effects to big game. There are no other areas with restrictions on trail use pertaining to deer fawning and elk calving. |
| **19-18** | ***Page 54 of 520 states: "***Wherever possible, all trails would be located to overlay existing snowmobile trails, existing user-created trails, and/or areas where vegetation and soil may be previously disturbed." ***Based on these criteria, the existing skidder trails and the existing power line ascent in the Walker segment would be available for OHV Class II trail construction.***<br><br>Response: The commenter's assumption is correct if the user-created route is not creating resource damage and if the power provider allows that activity within their easement; however the Walker segment was designed with several resource considerations including sensitive soils, big game habitat, designated Old Growth, and cultural resources. |
| **19-19** | ***Page 54 of 520 states: "***New trail segments would not be constructed directly up steep slopes. Sustained grades would not exceed 12 percent, and the maximum trail grade of any trail segment would not exceed 30 percent. This would reduce the capacity of the trail to capture and channel runoff." ***However, the Forest Service Handbook, (FSH 2309.18), Design Parameters for Four-Wheel Drive Vehicles Greater than 50 inches in Width, presented earlier in these comments, present technical guidelines for a target grade of 10%-21%. There are numerous design techniques which mitigate water channeling and runoff. Some of these mitigation measures include water bars, trail grade changes, retention basins and trail hardening techniques. The trail grade is a significant factor in the success of a Class II trail system and greatly affects the satisfactory trail experience of the Class II user. Using the Sensitive Soils map presented in the DEIS (figure 22, pg. 146), a figure was prepared (see letter page 16) which illustrates those areas where the soils are not considered sensitive.***<br>***These soils coincide with numerous slopes with the target grade of 10% to 21%. Some of these areas also have existing skidder trails. Therefore, the OHV Class II system in the Walker segment should not be limited to a grade of 12% or less.***<br><br>Response: See Response 19-18. |
| **19-20** | ***Page 62 of 520 presents*** Table 3. Comparison of OHV Opportunities between Alternatives.<br>***The Black Rock Pit is not included in the listing of play areas for Alternative E, however, the maps and report text include this area.***<br><br>Response: The FEIS will be corrected to include Black Rock pit in Table 3. |
| **19-21** | ***Page 63 of 520 presents*** Table 4. Total miles of trails by OHV Class and Alternative***.***<br>***We would like to see an addition table which presents trails by OHV class and alternative giving the total miles of trails utilizing roads, total miles of trail utilizing user created routes, and total miles of trail utilizing new construction.***<br><br>Response: Table 26 of the FEIS (page 98) displays trail miles by alternative and class of vehicle. Table 45 of the FEIS (page 145) displays total miles of trail and new trail construction by alternative. Table 47 (page 154) displays miles of roads converted to trails by alternative. |
| **19-22** | ***Page 77 of 520 states:*** Oregon State Law allows OHVs to travel on one-lane gravel and native surface roads (Oregon Parks and Recreation Department 2009). Over 5,000 miles of road are available for OHV use on the forest to all classes of vehicles and 800 miles of road on the Crescent Ranger District. Certain |

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| | classes of OHVs are also permitted on roughly 350 miles of designated trails for OHVs on the Deschutes National Forest ...<br>***This statement is again misleading. The average reader would not know that only 20 of the roughly 350 miles of designated trails are available for OHV Class II users. Because NEPA requires a full and fair discussion of the facts, the mileage for Class II must be accurately presented.***<br><br>Response: The full text of the quoted text also acknowledges there are no designated Class II opportunities on the Crescent Ranger District. Page 80 of the FEIS will be corrected to accurately reflect Class II trails are currently limited to 21 miles at Edison Butte. The central Oregon website lists Cline Buttes as having 40 Miles of Class II Trail. The Cline Buttes Decision Record was issued August 26, 2010. |
| **19-23** | ***Page 79 of 520 states:*** There are roughly 900 miles of forest system trails on the Deschutes National Forest and about 153 miles on the Crescent Ranger District that are managed exclusively for non-motorized uses (excluding snowmobile, cross-country ski, and snowshoe trails). The 351 miles of forest trails on the Deschutes National Forest that are managed for OHV use are also open to non-motorized uses.<br>***Again, this statement is misleading. Only 20 miles of OHV trail are available for OHV Class II users.***<br><br>Response: "OHV" implies all classes of users. Also see Response 19-22. The FEIS will be corrected to accurately reflect the class of users for this segment of trail cited. Edison Butte lists 21 miles of Class II trail and Cline Buttes lists over 40 miles on the BLM website. The Cline Buttes Decision Record was issued August 26, 2010. |
| **19-24** | ***Page 81 of 520 states:*** Non-motorized users may use designated motor vehicle routes and would expect to encounter motor vehicle use, thus, not affecting the expectation and experience. In areas where the non-motorized user does not expect to encounter motor vehicles is where the user conflict occurs. It is within these areas and under these situations that user conflicts are often exacerbated due to noise, emissions associated with motor vehicle use, and lack of awareness of motor vehicle use in the area.<br>***The use of the Three Trails OHV system by non-motorized users has not been fully and fairly analyzed using proven scientific facts. Developed walking trail systems on national forest land require an environmental analysis because environmental impacts can be expected. Just because the primary use of the Three Trails OHV trails will be by motorized users, does not eliminate the impacts caused by non-motorized users. NEPA does not allow impacts by only one group to be analyzed while completely ignoring impacts by other groups. It must also be stated that according to the Deschutes National Forest Travel Management DEIS, non-motorized users of the forest tend to be less tolerant of other users than motorized users.***<br><br>Response: As noted by the commenter and in the Travel Management DEIS, non-motorized users do tend to be less tolerant of some of the noise and dust associated with motorized use. Therefore, non-motorized users of the designated motorized trail system are not expected to be anything other than occasional. |
| **19-25** | ***Page 83-84 of 520 presents*** Table 18. Selected OHV Opportunities close to the Crescent Ranger District.<br>***Cline Buttes is not yet a designated OHV system and the actual trail opportunities are currently not known. This area should not be included in this table.***<br>***In addition, the North Millican, Millican Plateau and the South Millican systems offer only shared use roads for OHV Class II. The ATV Class cell should be changed to "I and III, Class II on Shared Use Roads*** |

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| | ***Only", the same as is already shown in the East Fort Rock row.***<br><br>Response: The Cline Buttes Decision Record for Cline Buttes was issued August 26, 2010 and Alternative 2 has been selected. Regarding a correction to the Millican systems, the FEIS will be updated. |
| **19-26** | ***Page 87 of 520 presents*** Table 20. Value of OHV experience by Vehicle Class***.***<br>***The portion of the table referring to OHV Class II is presented below (See page 18 of letter).***<br>***This table clearly shows that the Crescent Ranger District has absolutely no idea what constitutes a "High Value" Class II trail experience. The newly constructed Quack Attack Trail 210 in the Santiam Summer Motorized Recreation Area is less than five miles long and will take a moderately modified 4x4 vehicle approximately eight hours to travel. There are also four side loops, each approximately ½ mile long, designed for highly modified 4x4 vehicles. When these side loops are added to the main trail, a highly modified 4x4 vehicle can play for up to two days.***<br><br>Response: No response is necessary. |
| **19-27** | ***It must be understood that the primary distinction of a high value trail is not the trail mileage, but rather the trail obstacles. Unless significant modification is done to obliterate the existing road prism and construct desired trail obstacles, the OHV Class II trails can only be considered a road with no value.***<br><br>Response: See responses to 19-11. |
| **19-28** | ***Page 89 of 520 states:*** The 2008 NVUM for the Deschutes National Forest estimated that there were approximately 1.9 million recreation visits to the forest each year (USDA Forest Service 2009c). Table 22 shows the activities in which people participated during their visits to the Deschutes National Forest. By using this survey data, and trends in the number of people participating in recreational activities (NSRE data) from Table 22, it is predicted that in the next 10 years, the activities with the greatest growth (in terms of total participants multiplied by percent change) would be wildlife/birds, general relaxing, viewing other features, hiking/walking, fishing and driving for pleasure. The activities with the least growth is predicted to be backpacking, cross-country skiing, snowmobiling, horseback riding, and other motorized activity (USDA Forest Service 2005).<br>***However, the DEIS provides contradictory evidence on page 76 of 520:*** NVUM data is a forest-wide perspective on visitation or "snapshot in time" for a particular year. It reflects the economy at the time and particular weather conditions during the sampling period. If there are external factors such as forests are in a mode of restricted entry due to wildfires, or it is raining during the sample period, then the monitoring reflects those conditions. It also was not particularly focused on A TV use. Responses from visitors are voluntary. It also is not comparable to previous NVUM data because of the changes over the years in the methods used for data collection. The Three Trails OHV Purpose and Need for the project was not based on NVUM data; it was based on public comment obtained through public meetings in selected communities and visible use that is occurring on the district in three particular areas. NSRE may not reflect local use (as NVUM data), but it does reflect national data from a larger and more frequent sample with greater confidence.<br>***Because the NVUM is considered a "snapshot in time", the statement that motorized activity is predicted to have the least growth cannot be made.***<br><br>Response: Page 75 of the DEIS discusses various sources of information regarding motorized and non- |

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| | motorized activity and the assumptions made in utilizing the data. It should be noted that assumptions and trends are for comparison purposes only to display differences in alternatives. |
| **19-29** | ***Page 118 of 520 states:*** Criteria 2a and 2b: Black-Rock is the only-new-trail construction that would occur in or adjacent to areas that have potential to meet these criteria. Alterative C and E would construct approximately four and two miles of trail (respectively) around the edge of Black Rock lava flow to take advantage of existing user-created roads and trails that link with an existing road system and the mineral extraction pit. There are no existing roads or trails within the relatively undisturbed 700-acre interior of the lava flow. Trail construction would be **50 inches wide**, there also would be no construction of roads, and active forest management utilizing timber sales are apparent up to the edge of the flow.<br>***We are assuming that the trail width of 50 inches is an oversight. OHV Class II trails are 80 inches wide.***<br><br>Response: Black Rock new trail construction was intended for Class II vehicles. The FEIS will be corrected to reflect a trail greater than 50 inches wide. |
| **19-30** | ***The Deschutes National Forest cannot place greater emphasis on soil conditions, nor can it require that disturbances be mitigated to maintain an undisturbed state. The forest must be managed to balance multiple uses and must allow motorized uses not only when it can be clearly proven to be harmless to the environment.***<br><br>Response: The Forest Service is providing for multiple use and bases the decision on the balance of effects. The Three Trails OHV project is consistent with Forest Plan Standards and Guidelines and Regional direction for soils quality (DEIS, page 126). |
| **19-31** | ***Page 269· states:*** Hayden et al. (2008) stated that disturbance factors in and of themselves have generally not been implicated in lower mule deer population performance. However, given the nutritional and energy requirements of deer, it seems reasonable to assume such factors could work insidiously with a number of other factors to negatively impact deer.<br>***NEPA does not allow for conclusions based upon "it seems reasonable to assume ... "***<br><br>Response: The conclusion was a disclosure (precisely) from the best available science used by the Forest Service and the assumptions were considered in a comparative manner to display differences in the alternatives. |
| **19-32** | ***Page 282 of 520 states:*** Alternatives B, D, and E all propose a designated trail system that minimizes trail use east of Highway 97 to Little Walker Mountain. This strategy with proposed road closures east of Highway 97 reduces motorized disturbance to mule deer during spring and fall migrations in habitats known to experience high use.<br>***The elimination of OHV Class II trails in the Walker segment which are proposed in Alternative C, as well as road closures in Alternative E cannot be based upon "motorized disturbance to mule deer" due to the abundance of contradictory evidence provided by these comments as well as the contradictory evidence cited in the DEIS itself.***<br><br>Response: Currently there are no known Class II trails, user-created or designated in the Walker Mountain area; therefore the Forest Service is not eliminating any Class II trails. The big game analysis and conclusions start on page 262 of the DEIS. The commenter did not present contradictory science for |

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| | the Forest Service to review. |
| **19-33** | ***Page 293 of 520 states:*** The implementation of a designated OHV system would have the potential to negatively effect roosting and/or maternity colonies of bats through motorized disturbance if trails are adjacent to roost sites. At the present time, roosting or maternity sites in forested stands or rock outcrops or lava fields are not documented but assumed to exist.<br>***This paragraph is completely forbidden by NEPA. The statement that the project "would have the potential to negatively effect" is completely unsubstantiated by scientific fact, and the statement "not documented but assumed to exist" does not meet the standards of scientific study required by NEPA.***<br><br>Response: The assumption is that the colonies of bats are there based on where they have been found on the Disitrict (page 291, DEIS) and suitable habitat is available. |
| **19-34** | ***Page 333 of 520 states***: Within the wilderness boundary, there is a raw slope along the Little Deschutes River. This site contributes significant amounts of fine sediment during peak discharge events.<br>***It must be stated that sediment impacts are caused not just by motorized recreation. The above statement on page 333 is a perfect example, as the "significant amounts of fine sediment" is occurring in a wilderness area where motorized vehicles are prohibited.***<br><br>Response: All the potential sources of potential sedimentation are disclosed in the document. Page 333 discusses sources of sediment to the Little Deschutes River. It should be noted that this is not a constant source, but is merely a "pulse" of sediment when environmental factors cause slope failure. |
| **19-35** | ***Page 417 of 520-states:*** COHVOPS currently manages eight designated trail systems with 605 miles of trails, 35 miles of shared use roads, and eight designated OHV play areas.<br>***It is important to note that only 20 miles of the 605 miles are OHV Class II trails.***<br><br>Response: See response to 19-23. |
| **19-36** | ***Page 417 of 520 states:*** Trail Logout - Trees that fall across trails create obstacles that must be removed before user-created trails are developed around the blockage. Trail logout takes place as trails open in the spring, after major windstorms, and periodically throughout the year to make certain there are no trees blocking the trails. Much of the logout would be accomplished by volunteers supporting the program.<br>***It must be noted that the maintenance of a Class II trail is significantly different than the maintenance of a Class I or Class II trail. In many instances throughout this section, it is clear that only motorcycles and quads were considered and that OHV Class II vehicles were not.***<br>***Downed trees are OHV Class II obstacles and are desirable trail features. Any tree on a Class II trail under 24-inches in diameter should be left on the trail for the enjoyment of the users. Signage should be posted on all Class II trails indicating that downed trees could be encountered and that these downed trees are not to be removed.***<br><br>Response: See response to 10-1. Consultation with all classes of users would occur in all phases of construction and maintenance. |
| **19-37** | ***Page 417 of 520 states: Trail Grooming – "***Trail grooming slows the development of trail moguls or whoops, fills holes and ruts, and improves the riding surface of the trails." ***Holes and ruts are OHV Class*** |

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| | ***II obstacles and are desirable trail features. Grooming of a Class II trail reduces the enjoyment of the trail. Signage should be posted on all Class II trails indicating that holes and ruts may be encountered and that a smooth tread is not to be expected.***<br>***Page 418 of 520 states:*** Trail grooming would be performed on high use trails to slow the growth of moguls and maintain a smooth tread. Once moguls have developed to the point that users ride off to the side of the trail, the trail would be scheduled for reconstruction. Generally, trails that have been reconstructed most recently would receive priority for grooming.<br>***Again, the maintenance for a Class II trail is different. A smooth tread is NOT desired.***<br><br>Response: See responses to 10-1 and 19-36. |
| **19-38** | ***Page 418 states: "***When a trail follows a closed road, cut material from logout would be staggered randomly from one side to the other so that an 'S' alignment is created. The cuts should not exceed the recommended clearing widths so the trails would not be passable by full-sized vehicles."<br>***Apparently the writer is unfamiliar with Class II vehicles, which generally are full-sized vehicles.***<br><br>Response: The Operation and Maintenance guidelines were taken from Central Oregon Combined Off-Highway Vehicle Operations and refer to Classes I and III trails. |
| **19-39** | ***Page 418 of 520 states:*** Trees that are leaning over the trail or suspended over the trail may be left in place if they are more than six feet above the trail tread and there is adequate sight distance in both directions to see and react to the potential obstacle.<br>***Trees that are leaning six feet above a Class II trail can become a safety hazard to some vehicles.***<br><br>Response: Maintenance operations would be tailored for the situation and class of vehicle. |
| **Letter #20** | **Ryan Moeggenberg** |
| **20-1** | ***Please know that the East Cascades Chapter of Back Country Horseman is still strongly opposed to any plan for placing OHV trail or trail system on top of the road presently occupied by the Metolius Windigo Trail just south of Hwy 58. While supportive of many multiple use philosophies, [we] feel that in this situation, separation will be the best practice to avoid conflict. Reasons for our concerns are the following:***<br>➢ ***The Metolius Windigo Trail is a historic trail that is just now being promoted and more widely used by stock users.***<br>➢ ***We accept that the Met Win crosses small roads throughout its length, but believe that placing a not-yet-existing OHV trail on top of it will lead to the Met Win's degradation, as seen on already decimated sections of the historic Santiam Wagon Road.***<br>➢ ***Recreational Stock Users will already be exposed to increased safety risks by the routing of the OHV trail through the same Hwy 58 underpass as the Metolius Windigo Trail.***<br>➢ ***Funneling motorcycles, quads, hikers, bikers, stock users, and passenger vehicles all on the same route –even if only for a mile- is simply not setting up for success. The risk to personal safety is too high.***<br><br>Response: See response 20-2. Land ownership, infrastructure such as railroads and major highways, and wilderness allocation makes this stretch of trail challenging to find any alternatives (page 29, DEIS). The trail is actually on a Maintenance Level 2 road that connects to an underpass that was originally installed in 1995 (page 29, DEIS). The Metolius-Windigo Trail was created in the 1980s, essentially linking existing |

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| | portions of trail. Although it is acknowledged the trail has traditional values for equestrians and other users, it does not meet the requirements to be historic such as the Santiam Wagon Road. A Key Issue was developed to respond to the concerns for potential incompatibility among all users. A solution to separate the trail as much as possible was developed, which was also supported by some equestrians. An alternative was considered that would move the shared portion up to the Diamond Peak Wilderness (page 60, DEIS), but it was eliminated from detailed consideration because of inconsistency with the Forest plan and feedback from the horsemen that it would not be consistent with the goals of the Metolius-Windigo trail, which is primarily to serve long-distance horse riders seeking an alternative to the Pacific Crest Trail at a lower elevation that is snow-free for a longer period of time. Safety is a primary consideration and signing and education would be used to encourage respectful behavior by all users. It should be noted that motorized and non-motorized users have been sharing the two mile stretch of road and trail for the last several years and monitoring by field rangers in the area has not produced documentation of incidents. |
| **20-2** | ***The entire length of the Metolius Windigo got cleared for the first time in probably decades this year and horsemen were known to thru-ride its entire length. Sharing sections throughout the trail with motorized travelers is acceptable. Drawing an intense level of motorized traffic to one section of the Metolius Windigo is not. There has got to be a better alternative.***<br><br>***(From March 17, 2009 letter: "Realizing that the area in question is very wet and perhaps difficult for alternative OHV routes [we] offer volunteer assistance in physically building a separate nearby single-track designed for non-motorized use…We believe that separating uses in this area will cause less impact in the long run than trying to combine uses onto one route.")***<br><br>Response: Volunteers have offered assistance in implementing portions of the Metolius-Windigo trail that would be separated, and the Forest Service greatly appreciates the help. In all action alternatives, the Metolius-Windigo horse trail, which utilizes Forest Service Road 5800620 has and would continue to provide shared use among motorized and non-motorized users. This road has been engineered with Best Management Practices for water quality (culverts and drainage systems appropriate for the location). Alternatives C through E would share common tread in or near wet areas and riparian-associated vegetation. Outside those areas and during every opportunity available, users would be on a parallel trail of up to 400 feet separation where possible (DEIS Chapter 3 page 335). |
| **Letter #21** | **Kenna Hoyser** |
| **21-1** | ***I want to say that I am totally in support of Option [Alternative] E of this plan. I think that the FS has done an outstanding job of balancing all the issues. On the balance there is a whole lot more to like than to not like in the plan and it is a huge improvement from the status quo.***<br><br>Response: No response necessary. |
| **21-2** | ***I think there is no viable alternative to shared use with type I and III OHVs unless the Met-Win were to be relocated to the west of the tracks into the Fawn Lake drainage somehow. I can't see any way of improving it without having adverse affects on other considerations.***<br>***That section is the least attractive section of the whole Met-Win and I wouldn't expect it to ever see significant equestrian usage. Also that section is already a high risk stretch for equestrians with a tricky railroad track/highway intersection crossing on one end, then traveling parallel to the busy train tracks and then culminating with the "tunnel" under Hwy. 58 on the other end. It is a section that*** |

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| | ***requires heightened awareness and control by horse riders anyway.***<br><br>Response: No response necessary. |
| **Letter # 22** | ***Ben F. Sunderland VI*** |
| **22-1** | ***…I do support both of the D and E Alternatives. However, "if" there is under consideration and/or the "risk" that if/when an OHV trails plan is adopted, that OHV will (then) be excluded from other areas of the forest, then I must advocate for Alternative A. I do not support an OHV specific area at the cost of losing access for other areas of our forests.***<br><br>Response: No response is necessary. |
| **22-2** | ***Please do…grant considerable weight to the socio-economic aspects of the project….We "must" emphasize continuation and enhancement of access and use of our public lands as "better" alternatives than the urban streets and/or inside, absent physical activities and appropriate surroundings for the welfare of (specifically) our children…***<br><br>Response*:* No response is necessary. |
| **22-3** | ***I am "somewhat" concerned about some of the intended limitations or restrictions or closures being considered as elements of some of the alternatives. Currently I am not certain that these are appropriate in this process or in the project. It "seems" that issues re: wildlife, vandalism, noise, inappropriate conduct; etc. should be responded to in manners other than within the scope of this project.***<br><br>Response*:* The Three Trails OHV project alternatives were developed in a landscape-scale and interdisciplinary manner in order to consider all resources, including rider's experience. |
| **Letter # 23** | ***Pat Marquis*** |
| **23-1** | ***As a member of the equestrian community, I must speak out against the Plan's intent to convert what is now a non-motorized trail in the vicinity of Crescent Lake Junction, and make it mixed use of OHV usage and non-motorized usage. …I speak of the Metolius-Windigo Trail as it winds its way from the under crossing at Hwy 58 and southerly for approximately 2 ½ miles to the railroad tracks. …this is a current and existing trail. It is a trail for non-motorized interests to use and enjoy. It has been so for many years.***<br><br>***Your draft plan has proposed that (Alternatives C and D) portions of the trail could be moved for the non-motorized interests. …why are we (the non-motorized user group) being forced to move? If the OHV interests want a corridor of travel, why are they not being imposed upon to build it?***<br><br>Response*:* The two mile stretch of the Metolius-Windigo trail has been shared by all users for many years, and the underpass was originally constructed for snowmobile use (page 30, DEIS). There is no element of the alternatives to move non-motorized users. Through extensive public comment with the users, Alternatives C-E separate the motorized and non-motorized uses as much as possible on the two mile stretch of the Metolius-Windigo trail was developed. See also response to 20-1. |

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| **23-2** | ***If the corridor that the Metolius-Windigo trail now travels is so sensitive that we cannot have separate trails, then why is this corridor being considered for motorized use at all? In recent years, the horse community has embraced the concept of "light on the land" and "leave no trace". But with heavy OHV usage, it will be virtually impossible for them (OHVs) to "Leave No Trace", as the pictures I sent in 2009 evidence the ground disturbance.***<br><br>Response*:* See response to 20-1. |
| **23-4** | ***Adding to our concerns for the local environs are our concerns for the riders', hikers', and bikers' safety. What are we to do if some OHV's approach at [high] speed as some have a propensity to do? Why would you risk the safety of others to accommodate the wishes of a few?***<br><br>Response*:* See Response 20-1, safety is a primary consideration and signing and education would be used to encourage respectful behavior by all users. Monitoring with field rangers, agency personnel, and volunteers would be performed to track conflicts and perhaps may initiate future modification subject to environmental analysis and public involvement. |
| **Letter #24** | ***Dan Fouts*** |
| **24-1** | ***…myself and a group of equestrian riders had the opportunity to ride the Metolius-Windigo Trail from Windigo Pass to the other end at Bear Valley. When riding through the area that Three Trails OHV Project is talking about, we had the discussion about, what would happen if OHVs were introduced to this section of the trail. There are some areas with water crossings that would be destroyed by OHV usage. Not only would the OHV usage destroy the area visually but would make crossing for equestrian most difficult. I'm sure you have seen where OHVs have found a spring or wet area in the forest, played for a few hours and destroyed what was a very nice meadow. It takes years for the area to come back if it ever does.***<br><br>Response*:* OHV use has been occurring on this stretch for years. A thorough analysis of the effects to water quality related to the riparian crossings can be found on page 334 of the DEIS. Also, Project Design Features for protecting areas near fens or wetlands would install structures such as split rail fencing and boulders to define the boundaries of the designated trail system (DEIS, page 52). These resource protection measures, in addition to monitoring on page 58 of the DEIS would be utilized. |
| **24-2** | ***Some of this section of trail is very flat and straight and would allow the OHV users to go at very high speeds, which in my opinion would create safety issues for equestrian users as there are, in some areas, no place to get off the trail.***<br><br>Response*:* See Response to 20-1. Safety would be a primary consideration and measures to control speed would be signed, monitored, and enforced. |
| **Letter #25** | **Randy Rasmussen, Asante Riverwind, et al.** |
| **25-1** | ***For reasons described in this comment letter and stated in our 27 March 2009 scoping letter for the Three Trails OHV Project (and in other comment letters regarding the various OHV projects currently underway on the Deschutes-Ochoco forests), we request that the Crescent Ranger District cease work*** |

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| | ***on the Three Trails OHV Project and immediately withdraw the DEIS until such time as all work is complete regarding the Deschutes-Ochoco National Forests Travel Management Plan. There remains inadequate justification to date to support a project of the timing and scale contemplated in the Three Trails OHV Project DEIS.***<br><br>Response**:** The Three Trails OHV project would prohibit cross-country travel only within the project area. Through extensive collaboration with the public and a desire by the Forest Service to be proactive in addressing the unregulated motorized use that is occurring on the Crescent Ranger District, the Responsible Official has decided it was in the public interest to proceed. Reference the Purpose and Need on page 22 of the DEIS, which in part states: "*There is a need to provide for a designated trail system where there is some community support on the Crescent Ranger District in a suitable and sustainable location while considering other forest uses.*" |
| **25-2** | **While we understand the need to designate specific OHV routes in portions of the Crescent Ranger District, we are greatly concerned by the magnitude and intensity of the OHV route systems evaluated among the DEIS action alternatives….**<br><br>**The concept for the Three Trails OHV Project has grown by leaps and bounds since its inception. The Central Oregon Provincial Advisory Committee's Travel Management Working Group did not envision a project of this magnitude when it expressed consensus that action was necessary to manage OHV-related resource damage within the Crescent Landscape Areas.[79] The Working Group's consensus recommendations were summarized by the Forest Service in a series of handouts distributed during a 19 July 2007 public meeting held in Redmond. One handout included the following three consensus "conditions" (out of 7 total) for the Crescent Landscape Areas:**<br><br>• **Support for investigating opportunity for designated trail system to help deal with Two Rivers [subdivision] problem with unmanaged use (avoid creating a sacrifice zone around Two Rivers).**<br>• **Primarily a low density, long distance system with connections to users.**<br>• **Management process was to reduce road density to meet Forest Plan standards in so far as practicable.**<br><br>**Yet the current alternatives contained within the Three Trails OHV Project DEIS represent a significant departure from these three conditions. Moreover, without explanation in the DEIS, the planning area now comprises 93,016 acres (a 20 percent increase from that indicated in the scoping notice) and the OHV trail system is now estimated to range between 130 to 153 miles, plus some 80 miles of road designated for OHV use depending on the alternative analyzed. For example, the Preferred Alternative (Alternative E) would include a total of 222 route miles (DEIS, p. vii).**<br><br>Response: The Provincial Advisory Committee as chartered by the USDA Secretary is made up of a diverse group of multi-stakeholders, including advocates for recreation, environmental conservation, and officials from local, state, and other federal agencies. They formed a working group of interested stakeholders with the purpose to achieve a community based consensus agreement. They accomplished their goal. The final July, 2007 recommendations were excerpted from a larger document, which can be found in the administrative record on the Crescent Ranger District but is summarized here: |

[79] Signatory parties to this letter include two members of the Working Group and one individual who attended some of the Working Group meetings.

**Crescent Landscape Area**

*The group supports considering the areas within the two polygons (Two Rivers and Boundary Springs) in the Crescent landscape area, under the following conditions:*

- Support for investigating opportunity for designated trail system to help deal with Two Rivers North problem with unmanaged use (avoid creating a sacrifice zone around Two Rivers)
- Consider creating a small play area to deal with problems
- Work with locals to identify areas of interest
- Primarily a low density, long distance system with connections to users
- Management process was to reduce the road density to meet Forest Plan standards in so far as practicable.

In response to these recommendations, all action alternatives include a segment called "Rivers" that addresses multiple concerns expressed by the homeowners, riders that use the area, and the general public. It includes the minimum routes necessary to provide connectivity to a well-planned trail system while closing and rehabilitating unnecessary trails. This responds to concerns from many stakeholders – including the homeowners themselves. It also addresses noise as a key issue and presents several alternatives that have varying solutions, which includes a small play area in two different locations. In addition to providing long distance connectivity to two other segments and local businesses at Crescent Lake Junction, it considerably reduces overall road densities averaged over 16 watersheds. In addition to meeting target road densities in the Forest Plan, it directs the existing motorized use to the most reasonable and sustainable places within the Old Growth, Wild and Scenic Rivers, and Late Successional Reserves – all using guidance under the Forest Plan.

The final document also included 10 caveats in order to achieve the consensus recommendation for the Two Rivers and Boundary Springs (Walker) segments:

- Providing a suitable and sustainable recreation opportunity
- Resource improvement over the existing condition
- Developing a trail system that meets multiple interests
- Utilizing existing infrastructure
- Education, engineering, enforcement, economics, environment, and evaluation are integral parts of any newly designated trail system
- A recognized need for a site-specific trail system before community support for can occur
- Meet Forest Plan Standards and legal procedures. The working group had a strong desire and agreement that the Forest Service reduce the road densities to meet Forest Plan standards in so far as practicable.
- Working group members also had strong desire and agreement that wildlife and wildlife habitat is important. There was, however, no agreement as to how to describe the size and configuration of unfragmented habitat.
- Other areas and existing designated areas may be considered or re-considered in the future.

All action alternatives considered and met these criteria as part of the extensive public involvement process. As a result of the public meetings and interdisciplinary deliberation, the Junction area was included for many reasons. These include a strong desire to responsibly direct the existing use that is occurring within the area in a logical and integrated manner. Therefore, the Rivers and Walker subareas incorporated the Junction segment and it follows the working group recommendations. The Provincial Advisory Committee's final recommendations were not intended to represent site-specific determinations of the conditions under which a designated trail system might be approved. Rather, they were intended to provide a broad-brush discussion of general concepts that had been the basis for the consensus. Public meetings strongly encouraged the Forest Service to look at motorized and non-

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| | motorized uses in the area from a holistic approach. Including the Junction segment allowed the flexibility to direct and spread out existing use in the Walker and Rivers segment to avoid sensitive areas to achieve a sustainable recreation opportunity while using existing infrastructure, meeting Forest Plan Standards and Guidelines, reducing overall road densities, maintaining wildlife habitat in the most critical places, and gaining community support. The Crescent Lake businesses and residents especially have vested participation in the public process and outcomes. |
| **25-3** | **Perhaps the significant increase in the size of the planning area could be attributed to a previous GIS mapping error? We could not find an explanation in the DEIS regarding what prompted this change. Nor do we understand why Alternatives C and E propose many miles of engineered OHV trail in excess of the 100-130 miles identified in the scoping notice.**<br><br>Response: NEPA is a public deliberative process and Alternatives C and E respond to key issues that were developed in response to the scoping for the proposed action. |
| **25-4** | **Parties represented in this comment letter …share the perception that completion of the Travel Management planning process always was implied to precede the development of site-specific OHV trail proposals like the Three Trails Project. In addition, despite the assertion that the DEIS serves as a Travel Analysis Process (p. 447), the Deschutes and Ochoco National Forests have failed to date to conduct that process as discussed in agency regulations and reflected in the directives for implementing the 2005 Travel Management Rule. Thus, it is both unwise and premature to consider new additions to the Forest travel system at this time. Only after completing the necessary Travel Analysis and identification of "a *minimum* transportation system which is streamlined, non-redundant, and efficient," would the Forest Service be in a position to assess the efficacy of additions to the Forest travel system at the scale contemplated in the Three Trails OHV Project EIS.**<br><br>Response: There is no requirement under the Travel Management Rule to accomplish a forest-wide minimum road system analysis prior to designating routes on a site-specific project. The Travel Management Rule, as expanded upon in the Directives, allows for two separate reasons for the travel analysis: 1) establishing a minimum road system, and 2) designation of routes for highway and non-highway-legal motor vehicles. It is not necessary to conduct Subpart A in order to engage in a Travel Analysis to accomplish Subpart B.<br><br>Further, The Forest Service Manual 7710 under Travel Analysis states:<br>"Travel analysis assesses the current forest transportation system and identifies issues and assesses benefits, problems, and risks to inform decisions related to identification of the minimum road system per 36 CFR Part 212.5(b)(1) and designation of roads, trails, and areas for motor vehicle use per 36 CFR Part 212.51. Travel analysis is not a decision-making process. Rather, travel analysis informs decisions relating to administration of the forest transportation system and helps to identify proposals for changes in travel management direction.<br><br>1. Use travel analysis (Forest Service Handbook 7709.55, Chapter 20) to inform decisions related to identification of the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of NFS lands per 36 CFR 212.5(b)(1) and to inform decisions related to the designation of roads, trails, and areas for motor vehicle use per 36 CFR 212.51, provided that travel analysis is not required to inform decisions related to the designation of roads, trails, and areas for those administrative units and Ranger Districts that have issued a proposed action as of January 8, 2009. |

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| | 2. Travel analysis for purposes of identification of the minimum road system is separate from travel analysis for purposes of designation of roads, trails, and areas for motor vehicle use. Travel analysis for both purposes may be conducted concurrently or separately.<br><br>**7712.1 – Scale and Scope of Travel Analysis**<br><br>1. There are multiple scales at which travel analysis may be conducted. Generally, use broad-scale travel analysis at the level of a Ranger District or an administrative unit to inform decisions regarding implementing the minimum road system and decisions related to the designation of roads, trails, and areas for motor vehicle use. An example of a broad-scale concern usually addressed at the level of an administrative unit is the ability to sustain the unit's road system at objective maintenance levels with expected levels of funding.<br><br>2. Travel management decisions do not need to be made at the same scale or at the same time as travel analysis.<br><br>3. The Responsible Official has the discretion to determine whether travel analysis at a scale smaller than a ranger district or an administrative unit is needed and the amount of detail that is appropriate and practicable for travel analysis. |
| **25-5** | ***The multiple and segmented analyses under the National Environmental Policy Act (NEPA) currently underway on the Deschutes-Ochoco National Forests consist of an unprecedented five (5) concurrent NEPA processes that resulted from the 2005 Travel Management Rule….***<br><br>***Each of the separate but parallel OHV projects are proceeding along a timeline that overlaps with the public planning process associated with the Deschutes-Ochoco National Forests Travel Plan/EIS…. the Forest Supervisors have chosen to improperly segment public involvement and environmental analysis into multiple projects that clearly are related in scope and in time.***<br><br>***… The Crescent Ranger District is proceeding with the current Three Trails OHV Project because it anticipates prohibiting motorized cross-country travel as required by the 2005 Travel Management Rule…. This claim is repeated in the current Three Trails OHV Project DEIS (p.21 and 22). Clearly, the Three Trails OHV Project must be considered a connected action with respect to the Forest's pending compliance with the Travel Management Rule. NEPA guidelines state that connected actions, the impacts of which must be considered in the same EIS, fall within one of three categories: Actions that:***<br><br>***(i) Automatically trigger other actions which may require environmental impact statements;***<br>***(ii) Cannot or will not proceed unless other actions are taken previously or simultaneously; or***<br>***(iii) Are interdependent parts of a larger action and depend on larger action for their justification.***<br><br>***40 C.F.R. § 1508.25(a)(1). The existence of a comprehensive program with cumulative environmental effects cannot be escaped by disingenuously describing it as only an amalgamation of unrelated smaller projects. National Wildlife federation v. Appalachian Regional Commission, 677 F.2d 883, 890 (D.C. Cir. 1981). Plainly, the four Deschutes-Ochoco National Forest OHV route proposals are part of the whole of the Forests' Travel Management process, and should be considered under a single, comprehensive EIS.*** |

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| | Response: Implementation of the Travel Management Rule does not hinge on implementation of this project, Lava Rock, or any other proposed or existing OHV trail system in central Oregon, or the implementation of the 2005 Travel Management Rule. There is no reasonably close causal nexus, or relationship between the decision to develop area-specific OHV trail proposals and implementation of the 2005 Travel Management Rule, which applies to all National Forests. While there are similarities to the existing East Fort Rock OHV trail system, the Three Trails OHV project, the Lava Rock OHV proposal, and any other OHV trail proposals on USFS lands in Oregon, each of these proposals are independent and can be implemented without implementing the others. As such, the Three Trails OHV Project is not a "connected action" under the NEPA (40 CFR 2508.25), and is not required to combine analysis with any other OHV proposals on Federal Lands. Currently, there are no designated OHV motorized trail systems on the Crescent Ranger District. |
| **#25-6** | ***As expressed via our comment letter regarding the Deschutes-Ochoco National Forests Travel Management Project Draft EIS and in scoping comments regarding the Lava Rock, Three Trails, Ochoco Summit and Meadow Lakes Basin projects, we believe that by conducting segmented yet simultaneous NEPA analyses, the Forest Service is on shaky legal ground. We have repeatedly expressed concerns that the direct, indirect, and cumulative effects analyses would be prone to inadequacies and the TMP EIS would improperly exclude these and other "connected actions."***<br><br>***… We maintain that the Forest Service is required to analyze these connected actions together as a suite of proposed actions under one EIS as a programmatic whole. While the restoration goals outlined in the Three Trails OHV Project are laudable and share our enthusiastic support, we cannot support the current NEPA process and the designation of motorized routes in the absence of a comprehensive environmental analysis.***<br><br>Response: Comment 20-5 addresses the NEPA definition for connected actions and why the projects mentioned by the commenter clearly do not meet the test for connected actions and the three criteria. Therefore the Responsible Official can decide how best to address a compelling natural resource situation, which has a great deal of public support, in a timely manner. |
| **#25-7** | ***Our scoping letter also requested that the EIS disclose whether regional connective OHV routes are planned or proposed by other federal and state agencies and/or OHV user groups. Yet the DEIS is silent on this topic, simply proclaiming:***<br><br>*"The number of connected miles open to OHVs on other (land) ownerships in this vicinity is considerable, but not known precisely. The exact number of miles of connected roads would not affect the conclusions made in this analysis" (DEIS, p. 446).*<br><br>***This statement is not responsive to our request for analysis of cumulative impacts associated with OHV routes designated via the Three Trails OHV Project. We did not request quantification of the number of miles of roads connected to the Three Trails OHV planning area but, rather, that the DEIS should analyze potential cumulative impacts associated with the connectivity with existing, planned or proposed OHV trails (regardless of jurisdiction/ownership) outside the planning area that could result from the designation of OHV routes in the DEIS. Included in this definition would be routes identified through public scoping, comment letters or other communications where interest was expressed for connecting OHV routes in the Three Trails planning area to motorized routes located within other ownerships. It is this type of analysis that is necessary for adequate disclosure of*** |

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| | ***potential cumulative impacts but that presently is absent in the DEIS.***<br><br>Response: The temporal and spatial scale of the analysis was variable depending upon the resource concern being evaluated, particularly for cumulative effects. The landscape within the Three Trails OHV analysis area boundary is the focus of this EIS, but adjacent lands are considered in this analysis process (DEIS, page 67). Where there is an overlapping zone of influence, or an additive effect, this information is disclosed.<br><br>The Three Trails OHV project is designed as a self-contained system and does not, for instance, dead end a trail at the edge of the project area where it might encourage user-created trails outside of the system. Numerous connections via Maintenance Level 2-5 roads outside the Three Trails OHV project area exist. Some of these lead to adjacent forests and individual OHV project areas mentioned by the commenter. If there is a relevant effect, it is incorporated into the existing condition. However, these connections are not designated and their status as a link is not proposed to change. The Deschutes National Forest and interlinking adjacent forest perspectives are discussed in their appropriate context and intensity under existing condition and cumulative effects (DEIS, page 74). For example, page 106 considers adjacent private land and noise. Also, there are numerous references to the adjacent State Forest, potential Crescent Creek Resort and potential effects related to their visitation. Riders that pass through the Walker Rim area to the Chemult Ranger District on the Winema National Forest were estimated and used in the rationale for potential increase in visitors to the Three Trails OHV Project area over time. Page 125 of the DEIS discloses an effect of the Lava Rock OHV Project and others related to opportunities for riders in central Oregon. However, the Three Trails OHV project would be considered a destination OHV area (as well as others) and it is highly unlikely an appreciable amount of visitors would venture from one destination to another for a day excursion. Sources used to estimate visitation over time, such as law enforcement officers, riders, and resort owners, confirmed assumptions used to determine the number of riders now in the future. |
| **#25-8** | ***The Proposed Action for the Three Trails OHV Project includes only motorized access goals for the summer season; absent is any attempt to better manage winter recreation and snowmobile use….***<br><br>***We encourage the Crescent Ranger District to simultaneously address summer and over-snow vehicle use because winter motorized use is extensive in the Three Trails planning area and occurs along many of the roads and trails that are subject to closure and/or restoration under each of the DEIS action alternatives. As such, the resultant route designations would be deficient by not developing concurrent management strategies for summer and winter motorized use when the continued maintenance and use of routes—regardless of season—could conflict with ongoing restoration goals and the ability of the Forest Service to provide opportunities for traditional and "quiet" recreational uses in planning area.***<br><br>***Subpart C of the 2005 Travel Management Rule provides guidance to Forest planners who choose to include winter motorized uses in their Travel Management and OHV route designation plans. We encourage the Crescent Ranger District to incorporate over-snow vehicular use in the Three Trails OHV Project using the integrated approach outlined in Subpart C.***<br><br>Response: As in the response to 25-4, It is not necessary to conduct Subpart C in order to engage in a Travel Analysis to accomplish any other subpart. Over-the-snow recreation and any type of management plan is outside the scope of this analysis. The effects associated with winter and summer use in the area do not overlap in space or time enough to make an appreciable difference in the effects |

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| | displayed in the analysis. |
| **#25-9** | ***Without thorough winter recreation planning in the Three Trails area, user conflicts have proliferated and illegal activity has flourished, while environmental impacts to vegetation, wildlife, and air and water have never been analyzed prior to allowing significant use of the majority of the planning area. As a result the Forest Service is failing to comply with the Executive Orders regarding OHV use that require the agency to address also snowmobile use to minimize resource impacts and user conflicts. For these reasons, we request that the Three Trails OHV Project include winter recreation travel planning in an attempt to resolve these and related issues.***<br><br>Response: Regarding winter recreation, the commenter does not present evidence of "user conflicts have proliferated and illegal activity has flourished" nor is there evidence on record at the Crescent Ranger District within the Three Trails OHV project area. Further, the commenter does not cite which Executive Order the Forest Service is not in compliance with for over-the-snow vehicles. See Response to 25-8 regarding the scope of the project and a much larger winter recreation travel planning effort. |
| **25-10** | ***The DEIS includes conflicting and erroneous statements regarding the degree to which the 2005 Travel Management Rule has shaped the proposed action and alternatives. While correctly recognizing that "the need for (the Three Trails OHV) proposal is basically a result of…the Travel Management Rule" (DEIS, p. 21), the scope of alternatives analyzed in the DEIS ignores that a decision is pending on the Deschutes-Ochoco National Forests Travel Management Plan. The description of the proposed action includes the statement:***<br><br>*"All other provisions for motor vehicle access, game retrieval, etc. would be the same as the proposed Travel Management Rule for the Deschutes National Forest (see Other Disclosures, Chapter 3)[80] (DEIS, p. 22)."*<br><br>***Conversely, the description of the No Action Alternative contained within the DEIS is structured to ignore two key elements of the Deschutes National Forest's pending Travel Management Plan—the prohibition of motorized (off-route) cross-country travel and the prohibition of public motorized travel on Maintenance Level 1 (closed) roads. Instead, the Three Trails OHV Project DEIS states:***<br><br>*"The No Action/No Change Alternative would not implement any changes in the current management direction regarding motorized access" (DEIS, p. 31).*<br><br>***An accurate accounting of the true extent of the existing, designated transportation system is a critical step in setting the appropriate baseline for analysis.***<br><br>Response**:** We will further clarify in the FEIS (pages 24, 25, 33, 36, and 70) the distinction between the Deschutes, Ochoco National Forests and Crooked River National Grassland Travel Management EIS and Three Trails OHV EIS.<br><br>The Travel Management Rule is the national regulation; and is proposed to be implemented on the Deschutes and Ochoco through the Travel Management Project. The proposed action of the Travel |

[80] Yet the reference that there are other disclosures regarding the Travel Management Rule in Chapter 3 is not correct.

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| | Management Project is to implement rule by those actions discussed earlier and by publishing the Motor Vehicle Use Map. The Three Trails OHV project is consistent with the Travel Management Rule, because it prohibits motorized access off of designated routes and also designates routes.<br><br>The affected environment (aka existing condition) shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration (40 CFR 1502.15). Currently there is no Travel Management Rule in place and the effects were analyzed in the appropriate scale and intensity. Further, "…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 (36 CFR 220)." The Three Trails OHV project document refers to the Travel Management Rule and Travel Management DEIS nearly 100 times as a foreseeable action as defined in 36 CFR 220.3, definitions. |
| **25-11** | ***The environmental benefits of the action alternatives contained within the DEIS are overstated as a result of: 1) the erroneous assumption described above used to define the No Action Alternative; 2) statements that the No Action Alternative will result in the ongoing pioneering of user-created OHV trails and, consequently; 3) statements that if the No Action Alternative were implemented, "herbaceous cover would continue to be removed as trail systems and parking areas expand" (DEIS, p. 31). These assumptions ignore the fact that the Deschutes-Ochoco National Forests are on the verge of issuing a decision for the forest-wide Travel Management Plan that would largely prohibit motorized cross-country travel and authorize OHV use only on designated trails and Maintenance Level 2 and 3 roads. These fundamental and pending changes represent a scenario of OHV management that is far superior to the No Action Alternative defined in the DEIS.***<br><br>***… Consequently, the No Action Alternative applied in the DEIS is not forward-looking and does not provide a valid baseline against which the impacts of the action alternatives can be realistically compared. Use of the static baseline scenario does not incorporate all of the factors relevant to the management of OHVs within the Deschutes National Forest by the time the OHV Project would be implemented. Consequently, the agency has failed to consider relevant OHV-related regulations in its definition of the No Action Alternative.***<br><br>Response: See response 25-10. Assessment of the affected environment was correctly applied and implementation of the Travel Management Rule on the Deschutes National Forest through the Travel Management Project as a foreseeable action was also appropriate. |
| **25-12** | ***The DEIS describes four key issues identified during initial project scoping that formed the basis for the development of DEIS action alternatives (DEIS, pp. 27-30).***<br><br>***…Key Issue #1 as identified in the Three Trails OHV Project DEIS, however, has no basis in agency policy or regulation. It is merely a concept promoted by OHV enthusiasts that has not been subject to peer-review scientific study of which we are aware. Yet invoking Key Issue #1 significantly biases the DEIS analyses by assigning the desires of the OHV-riding public to a level equivalent to, or more important than, criteria that by law must be satisfied when the agency designates OHV routes.***<br><br>Response: Key, or significant issues are not required to be subjected to peer-reviewed science and the Responsible Official has the discretion to identify the scope of the analysis through identification of key issues (DEIS, page 27). Also see Forest Service Handbook 1909.15, Chapter 10, section 12.4 issues. |

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| **25-13** | ***Our view of the degree to which Key Issue #1 served as the primary driver of the DEIS analysis is reinforced by the four site-specific amendments proposed to the Forest Plan under all action alternatives. Each of the amendments are necessary to remove impediments to the designation of certain landscapes to emphasize OHV use. In each case, doing so would come at the expense of key elk and designated old growth habitat on Muttonchop Butte and increased OHV activity, noise and pollution for residents in Crescent Lake Junction. It's no wonder that the agency's Preferred Alternative incorporates "most of the design features that the riders requested."***<br><br>Response: A thorough disclosure and explanation of the need for the Forest Plan Amendments is in Chapter 3 incorporated into the recreation and wildlife effects disclosures. It also can be in found on pages 437-440 of the DEIS, where an assessment of each amendment is presented. Forest Plan amendments to move Old Growth and Key Elk areas allows them to better function for the species for which they were intended, including goshawk and pine marten (starting on page 208 of the DEIS), as well as big game (DEIS, page 262). The Forest Service has received comments of support for the amendment, including the Rocky Mountain Elk Foundation. |
| **25-14** | ***Yet in public meetings for the Three Trails Project, we heard of OHV enthusiasts who demanded even more trail miles then [sic] that addressed in the Preferred Alternative. The DEIS notes this phenomena, when it states: "Many riders desire the most trail miles possible" (DEIS, p. 28). The DEIS is seriously flawed by its pursuit of this unquantifiable objective (i.e., what riders "want"), which fails to recognize the wide diversity of desired recreational experiences among this user group, and which represents a constantly "moving target" as the capability and range of OHVs increases year after year.***<br><br>Response: The Responsible Official will select an alternative after reviewing all public comments and the analysis of effects. A thorough disclosure of all the recreation pursuits, including non-motorized, is found in the recreation section. The DEIS does not attempt to break out the resource by motorized versus non-motorized because 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. |
| **25-15** | ***The project's proposed action is defined so narrowly as to quantify an amount of designated OHV routes that would appeal to a full range of rider abilities and desires. It states in part that "the proposal would provide approximately 100-130 miles of interlinking trails…to provide an opportunity for beginner through advanced riding experiences" (DEIS, p. 22). This formulaic approach appears to prescribe an outcome for the proposed trail system before the analysis of constraints can be applied via the EIS analyses. At a minimum, by quantifying the necessary trail miles in its public scoping documents, the Forest Service inadvertently inserted false hope among the OHV riding public that it would deliver such an extensive OHV system irrespective of the outcome of the environmental analysis.***<br><br>Response: The proposed action is consistent with National Environmental Policy 40 CFR 1502.10(d and e). "The Proposed Action is a proposal by the Forest Service to authorize, recommend, or implement an action to meet a specific purpose and need." Thus it becomes a starting point to present to the public a project proposal and to solicit comments and ideas. Based on the comments received, the Interdisciplinary Team and the Responsible Official then identifies the key issues. Alternatives are then developed in response to the key issues (DEIS, pages 22, 33-37). |

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| **25-16** | ***The approach of quantifying a range of mileage of engineered OHV routes precludes any receptivity to, and discussion among, the OHV-riding public of an alternative to be analyzed in the DEIS that contained less than 100 miles of engineered OHV trails. We view this as a deficiency in the DEIS. Moreover, the amount of engineered OHV trail proposed in Alternatives C and E of the DEIS exceed the 130-mile range stated in the proposed action. So while the DEIS analyses expresses no qualms about ratcheting up the proposed OHV route miles (based on "what the riders want"), the inference that the Forest Service is precluded from exploring alternatives that contain less than 100 miles of engineered OHV trails is arbitrary and in violation of NEPA, and does not adequately reflect Forest Service criteria for the designation OHV routes and the existence of significant constraints posed by wildlife, other existing recreational uses and the presence of nearby residences.***<br><br>Response: It is unclear what the commenter is referencing as "…the inference that the Forest Service is precluded from exploring alternatives that contain less than 100 miles of engineered trails." The Responsible Official does not have to analyze an infinite range of alternatives, only a reasonable number depending on the nature of the proposal (CEQ's 40 most asked questions) and 36 CFR 220.5(e). The Three Trails OHV project has satisfied this requirement. Although trail miles may total a hundred miles or greater, the alternatives respond quite differently to the key issues in their configuration and density. Currently, there are at least 114 miles of known user-created trails (FEIS, page 87, Table 5) and that number is expanding every year. The action alternatives propose restoration on up to 95 miles of those trails.<br><br>The Three Trails OHV project considers five alternatives and explains why other alternatives were not analyzed in detail (DEIS, pages 30 and 59, respectively). Starting on page 66 of the FEIS, an alternative was proposed that would make the trail system from shared-use roads with no engineered trails. This was considered because some members of the public believe motorized use of National Forest Lands should be restricted to the dedicated transportation system and additional use of user-created or new trail construction is inappropriate. This alternative was eliminated from detailed consideration because it does not meet the Purpose and Need to provide a designated trail system where there is some community support on the Crescent Ranger District in a suitable and sustainable location while considering other forest uses. Also, the Forest Service considered prohibiting cross-country travel without a designated trail system. This was eliminated from detailed consideration because it does not meet the Purpose and Need for providing a well-engineered and interconnected trail system for non-highway vehicles. |
| **25-17** | ***Given our claim that the DEIS failed to consider pending implementation of relevant OHV-related regulations (i.e., Travel Management Rule) in its definition of the No Action Alternative, the Forest Service should have included an action alternative that addressed this scenario. In other words, the DEIS is flawed because it did not include an alternative that reflected a scenario wherein, upon implementing the forestwide Travel Management Plan, cross-country motorized travel was prohibited and OHV use was authorized only on designated trails and roads as depicted by the Forest's Motor Vehicle Use Map. Only through analysis of such an alternative could the potential environmental effects of the action alternatives be accurately compared.***<br><br>Response: The Forest Service considered an alternative similar as suggested here by the commenter in Chapter 2 under "Alternatives Considered but Eliminated from Detailed Analysis" on page 61 of the DEIS: **Make the Trail System from Shared-use Roads and No Engineered Trails.** This was an alternative considered because some members of the public believe motorized use of National Forest Lands should be restricted to the dedicated transportation system and additional use of user-created or new trail |

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| | construction is inappropriate. This alternative was eliminated from detailed consideration because the Forest Service believes a well-designed and monitored trail system using both existing shared use and engineered trails can provide a positive riding experience for a segment of the public that desires and needs a designated trail system while maintaining various other uses of the National Forest lands. Further, this alternative does not meet the purpose and need because the Forest Service believes a well designed trail system cannot be achieved solely on shared use roads. Many riders have expressed this concept. See Response #25-10 that describes how the document has properly followed the sequence of implementing the Travel Management Rule. |
| **25-18** | ***The range of action alternatives analyzed in the DEIS is insufficient and is not responsive to key issues identified via public scoping. As described above, the DEIS lacks an action alternative that contains less than 100 miles of engineered OHV trail. While this is clearly an OHV route designation project, the extent of the route system should not have been prescribed with some minimal amount of OHV trail. Doing so would appear arbitrary and not consistent with the spirit and intent of NEPA.***<br><br>Response: See responses 25-16 and 25-17 regarding the Three Trails OHV project properly providing an adequate range of alternatives and identifying the scope of analysis as responded to in 25-12. |
| **25-19** | ***The DEIS also fails to structure action alternatives for which Key Issues #2, 3 and 4 are assigned a higher—or overriding—priority as compared to Key Issue #1 ("provide the recreational experience riders want"). As stated previously, the DEIS demonstrates bias by prioritizing Key Issue #1 over the other key issues defined in the DEIS analysis. Other action alternatives should be included in the EIS that place greater weight on these other issues and OHV route designation criteria required under Forest Service regulation. In doing so, we believe the agency would be unable to justify non-sustainable activities such as "hill climbs," for example, which currently are proposed in the Preferred Alternative on Muttonchop Butte. The DEIS fails to develop action alternatives that prohibit OHV use including noise impacts in core wildlife habitat areas, connective areas and watersheds.***<br><br>Response**:** On page 22 of the DEIS, the stated Purpose and Need is the following: "*There is a need to provide for a designated trail system where there is some community support on the Crescent Ranger District in a suitable and sustainable*[81] *location while considering other forest uses"* (DEIS page 22*).* Following public response, Key Issues and a range of alternatives were the identified by the Responsible Official. See responses #25-12 and #25-17. There is no attempt to prioritize issues in the numbering sequence. Chapter 3 has a thorough and robust disclosure of effects related soil and water quality, as well as effects from noise to wildlife for all action alternatives considered in detail.<br><br>On Muttonchop Butte, there is a mineral extraction pit where considerable site disturbance has already occurred. The play area (cross-country travel) and all hill climbs are contained within the pit itself. There are closures and rehabilitation of many user-created trails outside of the pit, as well as a Project Design Feature to maintain vegetation surrounding the pit.<br><br>There are many aspects to the action alternatives that reduce or eliminate "noise impacts in core wildlife areas, connective areas and watersheds. " See Response to 14-11. Common to all action alternatives, there is a substantial reduction in road densities, generally moving motorized use away from water, and elimination of cross-country travel. |

[81] Sustainable locations are those in the least sensitive areas with larger tolerance to motorized use over time, such as upland/drier sites with the least resources that have a relatively low threshold to habitat modification.

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| **25-20** | ***Absent … is an alternative in the DEIS that does not include OHV use of the two-mile section of the Metolius-Windego [sic] Horse Trail. The DEIS fails to discuss an alternate means by which OHV enthusiasts might access businesses located on the north side of Highway 58. Conceivably, those OHV enthusiasts wishing to access the few existing businesses at Crescent Lake Junction located along the north side of the two-lane highway[82] could cross the highway as pedestrians currently do now—by walking. If the Forest Service can not publicly condone pedestrians crossing the highway, then an alternative should be analyzed in the DEIS that includes construction of a pedestrian walkway/overpass. Given the expense associated with other proposals in the DEIS to construct a railroad crossing for OHVs near the Mowich siding and/or an underpass for OHVs at Highway 97, costs associated with constructing a pedestrian overpass at Crescent Lake Junction should not represent a limiting factor.***<br><br>Response**:** The two mile stretch of the Metolius-Windigo Trail is currently being shared by both motorized and non-motorized users. The Highway 58 underpass one mile west of Crescent Lake Junction was built with funding from the snowmobile groups and the Federal Highway Commission to provide a safe access under the highway. The Metolius-Windigo horse trail, currently open to hiking, horses, and mountain bikes (except in wilderness sections), was relocated to take advantage of this safe crossing under the highway and along an existing Maintenance Level 2 road. Other options are limited due to the Burlington-Northern railroad tracks adjacent to the Diamond Peak Wilderness, private land, and riparian conditions. Page 60 of the DEIS considered an alternative that would move the Metolius-Windigo Horse Trail into the Wilderness. This alternative was considered but eliminated from detailed analysis because a solution was found that addressed the safety concerns using cooperation from user groups, education, signing, and limited separation of the tread of the trail to maintain water quality. The reroute into the Wilderness would have entailed either a new stretch of trail, or use of a considerable length of existing trail, which would potentially be inconsistent with the Deschutes Forest Plan and maintaining wilderness values: M6-56 – that states "Trail systems would not normally be expanded into currently untrailed areas that are providing opportunities for solitude and primitive recreation." Further, it would not be consistent with the goals of the Metolius-Windigo trail, which is primarily to serve long-distance horse riders seeking an alternative to the Pacific Crest Trail at a lower elevation that is snow-free for a longer period of time. A walkway would only be a partial and expensive solution for motorized access to the Crescent Lake Junction businesses and services. The Metolius-Windigo Trail also serves as a connector of the rest of the trail system to the Rivers and Walker segments from the Junction Sno-Park staging area. |
| **25-21** | ***For physically challenged OHV users desiring to frequent businesses on the north side of Highway 58, the DEIS could analyze an alternative that authorizes shared OHV use of the Metolius-Windego [sic] Horse Trail for persons displaying a Department of Motor Vehicles-issued placard or other instrument. We see no reason why equestrians and pack teams must risk safety hazards associated with OHVs when other options have yet to be explored for persons wishing to cross a two-lane undivided highway. As is stands now, we see no justification for the current proposal to allow OHV users "a place to recreate and shop without leaving the saddle."***<br><br>Response**:** See Response 25-20. In public meetings and collaboration between Forest Service personnel and members of Oregon Equestrian Trails and East Cascades chapter –Back Country Horsemen, there |

[82] The gas station and general store are located on the south side of Highway 58 within Crescent Lake Junction and, as such, do not require crossing

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| | was mixed reaction to sharing the two mile stretch with OHVs. Some members thought it was a workable solution. The Forest Service proposes to separate uses except in wet areas (riparian reserves/RHCA) of the two mile stretch of the Metolius-Windigo trail, by paralleling wherever possible. Signing would be used to encourage respectful behavior by all users (DEIS page 65). |
| **25-22** | ***DEIS Demonstrates Bias Against Quiet Recreation and, as such, Fails to Minimize the Impact of OHV Use per Executive Order 11644:***<br>***With the exception of bird watching at Crescent Creek Campground (DEIS, p. 106), the DEIS fails to minimize OHV-related conflicts with other recreational uses in the planning area. The DEIS essentially concludes there are ample opportunities for traditional, quiet recreational uses outside the Three Trails OHV Project area. It goes so far as to imply that quiet recreationists simply can choose to go elsewhere, when it states:***<br><br>*"Hikers or those seeking a more quiet form of recreation would be able to view the OHV designated system maps and the MVUM and plan their quiet recreation accordingly" (DEIS, p. ix).*<br><br>***Indeed, the DEIS states frankly: "The primary goal of the designated trail system is to allow OHVs a place to recreate" (DEIS, p. ix). This indifference to, and bias against, quiet recreation is demonstrated throughout the DEIS through proposals such as shared motorized use along two miles of the currently non-motorized Metolius-Windego [sic] Horse Trail. Despite clear safety conflicts associated with slow-moving pack stock use along the trail and ATVs capable of speeds over 60 mph, the DEIS claims the shared use designation is necessary as "this section of the trail contains the only safe crossing of Hwy 58, via an underpass, to access the Crescent Lake Junction businesses" (DEIS, p.ix).***<br><br>Response: The DEIS has a thorough disclosure of how this project effects quiet recreation (DEIS, Recreation). The analysis found the action alternatives provide further separation of uses between the motorized and non-motorized communities, potentially providing a higher quality experience for the non-motorized visitor.<br><br>See Responses 20-1, 25-20, and 25-21 regarding the Metolius-Windigo Trail and safety. |
| **25-23** | ***Stated Purpose and Need not Supported:***<br>***In August 2010, Randy Rasmussen, formerly of the American Hiking Society, shared with your office the results of a recent study commissioned by the Deschutes National Forest by researchers from West Virginia University and Penn State University titled: 2008 Central Oregon Off-Highway Vehicle Use Study: A Survey of Characteristics, Behaviors and Perceptions. Final Report Submitted to Deschutes National Forest, USDA Forest Service (Region 6), Bend, OR. December 2009. Its authors conducted surveys with 345 visitors to various designated OHV sites within the Deschutes-Ochoco National Forests throughout different seasons in 2008 and 2009. The report concludes that "OHV visitors are satisfied with their overall experience and do not perceive crowding to be an issue" (Executive Summary, pg. 3).***<br><br>***The conclusions of the study cast serious doubt on the purpose and need of the Three Trails OHV Project and its current proposal to designate an extensive OHV trail system of 110 to 153 miles of OHV trails within the 93,000-acre planning area. The aforementioned study was unable to document widespread demand among OHV riders for additional riding areas. In fact, the study found that 96 percent of OHV respondents rated the miles and variety of trails available in existing OHV riding areas as good to excellent. Remarkably, less than one percent of OHV riders rated as "Awful" both 'Miles of*** |

***trail available' and 'Variety of trails available' in designated OHV areas on the Deschutes-Ochoco National Forests.***

***With OHV riders as a whole comprising only two percent of all recreational visitation (according to data compiled by the Deschutes-Ochoco National Forests), it is incomprehensible how the Forest Service can justify the significant expense and resources to plan, design, construct, monitor, maintain and enforce an extensive OHV trail system like that proposed via the Three Trails OHV Project. The cost of the EIS process alone certainly will exceed $100,000.***

Response: Page 78 of the DEIS: In 2009, Robert C Burns et al. published a study titled " **2008 Central Oregon Off-Highway Vehicle Use Study: A Survey of Characteristics, Behaviors and Perceptions."** The focus of this investigation was an evaluation of visitor perceptions of current conditions at OHV areas due to growing visitation and congestion at certain sites within the Deschutes–Ochoco NF. This report focused on highlights of basic findings from on-site interviews that were conducted over the 2007-2008 OHV recreation season. In conclusion, results suggest that visitors generally were very satisfied with their overall experience, felt that is was not crowded, the number of people they saw was about what they expected or less, and went there because it was a good place to do the activities they enjoy. This conclusion has limited application to the Three Trails OHV Project Area for a couple reasons. Responses would likely be different at Crescent Lake Junction or Two Rivers North, where there are no nearby designated trail systems. Also, the clientele interviewed for the study is likely a different subset of visitors than are found at the Crescent Ranger District, where public meetings in Eugene and Klamath Falls has indicated a strong visitation from those communities.

Regarding the National Visitor Use Monitoring alluded to by the commenter's citation of a low visitation figure, the following was clarified on page 76 of the DEIS:

The NVUM survey is an effort that collects information on National Forests and Grasslands about visitor satisfaction and use every five years. It is a broadscale look and not necessarily good at site-specific information. It can be useful in displaying the percent of use of the National Forest by activity. It displays the second round of NVUM surveys from 2008 (USDA Forest Service 2009c). NSRE data source is 1999-2007 survey information for the National Survey on Recreation and the Environment (Cordell et al. 2008b). NVUM data is a forest-wide perspective on visitation or "snapshot in time" for a particular year. It reflects the economy at the time and particular weather conditions during the sampling period. If there are external factors such as forests are in a mode of restricted entry due to wildfires, or it is raining during the sample period, then the monitoring reflects those conditions. It also was not particularly focused on ATV use. Responses from visitors are voluntary. It also is not comparable to previous NVUM data because of the changes over the years in the methods used for data collection. The Three Trails OHV Purpose and Need for the project was not based on NVUM data; it was based on public comment obtained through public meetings in selected communities and visible use that is occurring on the Crescent Ranger District in three particular areas. NSRE may not reflect local use (as NVUM data), but it does reflect national data from a larger and more frequent sample with greater confidence.

For example, the NVUM data shows of those that visited the Deschutes National Forest, 2.1 percent used an OHV for recreation sometime during their stay. Whereas on a national level, 19 percent of visitors use an OHV. In 2008, Deschutes National Forest visitors that hiked for the day (40.6 percent) more closely matched up with the national average (35.4 percent).

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| **25-24** | ***As stated in our scoping comment letter, OHV use represents a small fraction of all recreational use on the Deschutes National Forest. The vast majority of visits, in contrast, are for traditional, quiet recreation. The high-impact nature of OHV recreation diminishes the quality of the recreational experience of other visitors (due to noise, safety concerns, pollution from two- or four-stroke engines, and dust that extend far beyond the trail itself) and often completely displaces non-motorized visitors. Our scoping comment letter requested that the Draft EIS not focus solely on motorized route designation and methods to "enhance" the OHV riding experience, but that it must focus also on achieving a trails and travel system that minimizes conflicts between quiet and motorized recreation. The DEIS is wholly inadequate in this regard.***<br><br>Response**:** The commenter is not specific enough in how the DEIS is inadequate. Chapter 3, titled "Recreation" in the DEIS has a thorough and robust discussion of all recreational endeavors and how audible sounds affect certain aspects of the recreational experience that occurs on the Crescent Ranger District and the Deschutes National Forest. In all action alternatives, quiet recreationists would be benefited by closure and trail rehabilitation which offsets creation of the trail system. Air Quality is also disclosed on page 432. Page 448 discloses potential conflicts between motor vehicle use and existing or proposed recreational uses of the National Forest System lands or neighboring Federal Lands. There is no documented evidence of conflicts between motor vehicle uses and other recreational uses on the Crescent Ranger District. The assumption is that the Ranger District is not as visited as other Ranger Districts on the Deschutes National Forest (FEIS, page 107), thereby there is ample room for most activities. Designation of an OHV motorized trail system would further separate uses and provide areas for quiet recreation. Reference Chapter 3 for a discussion on the types of uses that occur on the Ranger District and how they are affected by this project. |
| **25-25** | ***Our scoping comment letter also requested that the EIS must define actions to be taken by the Forest Service in response to trends in recreational use documented by the Oregon Parks and Recreation Department that demonstrate an existing unmet demand for non-motorized forms of trail-based activities in Central Oregon. We requested that the Three Trails OHV Project not compound current unmet demand by the designation of motorized routes in areas that otherwise could be managed to provide quality non-motorized recreational experiences. Again, the DEIS failed miserably in this regard, inferring that quiet recreationists can go elsewhere.***<br><br>Response: In accordance with NEPA, the scope of the proposed action and purpose and need is have been narrowly focused to consider the benefits and trade-offs of a designated motorized trail system, and that there is no intent for the scope of the document to meet all recreation demands of all kinds across the forest. In all action alternatives, quiet recreationists would be benefited by closure and trail rehabilitation which offsets creation of the trail system. The 1960 Multiple Use – Sustained Yield Act requires the Forest Service to manage National Forest System lands for multiple uses (including timber, recreation, fish and wildlife, range, and watershed). All renewable resources are to be managed in such a way that they are available for future generations. The Three Trails OHV Project by addressing motorized use benefits a full range of resources for the future – including an improvement of non-motorized experiences by further separating uses. It is unclear how the commenter believes that the DEIS infers that quiet recreationists go elsewhere, that, indeed, given the kinds of OHV uses currently within the project area, the DEIS anticipates and improves conditions for quiet recreationsists. This includes a clear understanding of where OHVs are allowed so they can make informed decisions about where they would like to recreate.<br><br>As noted in the response to comments section of the final directives for the Travel Management Rule, |

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| | motor vehicles are an appropriate way for people to enjoy their National Forests – in the right places, and with proper management. |
| **25-26** | ***The EA Must Address the Ability of the Forest Service to Properly Implement, Monitor and Enforce Rider Compliance with any Designated OHV Routes:***<br>***The DEIS states "it is unknown what level of non-compliance may occur initially" after implementation of the Three Trails OHV Project (DEIS, p. 413). However, the DEIS fails to disclose peer-reviewed studies that document a high rate of willful non-compliance among OHV riders for staying on routes within a designated OHV route system (see Attachment 1 re: Law Enforcement). The EIS must disclose these facts, which can be reasonably anticipated based on the best available social science, and analyze the direct and indirect environmental impacts of the anticipated rate of non-compliance. Instead, the DEIS pursues the theory that a high rate of compliance with a designated OHV system might best be achieved by providing the riders "what they want."***<br><br>Response: This is an Environmental Impact Statement (EIS), not an Environmental Assessment (EA). The Forest Service has reviewed the attachments provided by the commenter related to efficacy of law enforcement in various locations around the country such as Utah and Colorado and agrees there are challenges to managing OHV use. Testimony from Jack Gregory was also reviewed. Enforcement is certainly an important aspect of obtaining compliance with any subset of users of the National Forest System lands. However, having an available and adequate recreation experience is also an important component, in addition to education and monitoring. By providing a trail system that fits "what riders want," it would go a long way to encourage them to stay on the trail. This would be no different than for local woodcutters that need fuel wood, or providing non-motorized experiences such as mountain bike trails.<br><br>Page 413 of the DEIS has a detailed Education, Enforcement, Safety, and Operational Maintenance Plan. How this plan details compliance is used as a reasonable comparison how law enforcement would take place in the Three Trails OHV Project area. Since 1988, this model has been used by the Central Oregon Combined Off-Highway Vehicle Operations (COHVOPS). Also, page 58 of the DEIS details a monitoring plan. Monitoring has shown a high level of compliance on designated trail systems in central Oregon managed by COHVOPS (98% over the past 18 months). |
| **25-27** | ***While the DEIS mentions that the Deschutes National Forest receives assistance from Deschutes County "with a cooperative deputy," (DEIS, p. 415) as a result of limited Law Enforcement Officer presence in the field (with one officer stationed in Crescent) it fails to mention if the Forest Service has any such cooperative agreements with Klamath County in which the Three Trails OHV Project occurs. Such information in important in disclosing to the public the degree to which local law enforcement is available to respond to calls for OHV violations on federal land within the planning area.***<br><br>Response: The Law Enforcement portion of the plan on page 415 specifies the current staff available in central Oregon as of November 2010. The officer that is stationed at the Crescent Ranger District responds to calls anywhere in central Oregon and vice versa. At this time there is no cooperative deputy from Klamath County; however designated motorized trail systems are eligible for funding opportunities for user education and law enforcement through the Oregon Parks and Recreation's OHV funds that are not available for enforcement of non-designated areas. This source has helped the COHVOPS organization to fund four to five full-time Deputy Sheriffs with focused responsibility on designated motorized trail systems. This information will be updated in the Final Environmental Impact Statement on page 421 of the FEIS. |

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| **25-28** | ***The EA must address the ability of the Forest Service to maintain the designated OHV route system: The 2005 Travel Management Rule mandates that the Forest Service consider "the need for maintenance and administration of roads, trails, and areas that would arise if the uses under consideration are designated; and the availability of resources for that maintenance and administration."[83] The responsible official must "monitor the effects of motor vehicle use on designated roads and trails and in designated areas."[84] The ROD for the Three Trails OHV Project must document the ability of the agency to monitor, enforce, and maintain that system. The Forest Service should refrain from designating routes that it will be unable to maintain, monitor, or patrol with its current budget and staff. These and other necessary elements, described below, must be analyzed disclosed in the ROD.***<br><br>Response: This is an Environmental Impact Statement (EIS), not an Environmental Assessment (EA). Pages 58 and 415 outlines a monitoring and enforcement plan, respectively. Page 450 of the DEIS discloses consistency with the Travel Management Rule, and specifically addresses the need for maintenance and administration of roads, trails, and areas that would arise if the uses under consideration are designated; and the availability of resources for that maintenance and administration. |
| **25-29** | ***The EIS needs to fully comply with these directives by analyzing impacts to the agency's roads and trail budget and the availability of funds to adequately enforce the OHV Trail system as a result of adopting the selected alternative. These elements represent a critical part of the analysis that must be disclosed in order for the public to understand the entirety of the project and how the critical role of monitoring, maintenance and administration of the designated motorized route system would be conducted and inform the necessary adaptive management to refine the plan over time. Accordingly, the EIS must include a specific monitoring plan (with specific measures and thresholds), a public education plan and a budget estimate for the annual implementation of the plan for the life of the plan for each alternative that includes OHV routes.***<br><br>Response: There is no requirement to include a discussion on the agency's road and trail budget and availability of funds and it is unclear how this would better inform the public. There has been ample discussion on enforcement and maintenance (DEIS, page 415) and the success in central Oregon. OHV trail safety, education, enforcement, and monitoring is unique in that there are multiple partners and volunteers contributing to the program and the users themselves contribute to their pursuit by paying licensing fees. |
| **25-30** | ***When determining the total cost of a proposed OHV trail system, the EIS should include both the cost of a maintaining roads and motorized trails, as well as costs associated with managing the motorized recreation systems, such as signage, trailhead management, enforcement, monitoring, and map production. To this end, we want to share a study that was recently completed by Dr. Michael Wing, Professor of Engineering in the Forest Engineering Department at Oregon State University. Dr. Wing developed an easily reproducible model for estimating the costs of a motorized route alternative (Attachment 2, with methodology described in Attachment 3). His model includes the ability to input figures associated with both roads and trails. We recommend that the Crescent Ranger District adopt this cost analysis model and include such information in the Three Trails OHV Project. We believe Dr.*** |

[83] 15 36 CFR 212.55(a)
[84] 16 36 CFR 212.57

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| | ***Wing's model provides the most comprehensive approach developed to date for calculating the actual cost of a proposed motorized travel system, as required under 36 C.F.R. § 212.55(a).***<br><br>Response: See response to 26-4 regarding timing and prioritization for recreation projects on the Deschutes National Forest. The Forest Service has reviewed the spreadsheet from Dr. Wing and although helpful for estimating costs, there are several other factors that were not presented in the model in order for the Responsible Official to make an informed decision. Implementation relies on available funds (which includes grants) and workforce (which includes volunteers). Central Combined Oregon Off-Highway Vehicle Operations (COHVOPS) has personnel and equipment already in place. Also, timing and location of implementation would occur in segments dependent upon the above resources. The focus would be on creating links to the trail system in strategic places such as providing community connections. Also a priority is restoration of riparian areas. A detailed estimate of equipment, personnel, and supplies needed for a trail system is found on page 420 in the FEIS.<br><br>The Forest Service is consistent with 36 CFR 212.55(a) which states: *General criteria for designation of National Forest System roads, National Forest System trails, and areas on National Forest System lands.* In designating National Forest System roads, National Forest System trails, and areas on National Forest System lands for motor vehicle use, the Responsible Official shall consider effects on National Forest System natural and cultural resources, public safety, provision of recreational opportunities, access needs, conflicts among uses of National Forest System lands, the need for maintenance and administration of roads, trails, and areas that would arise if the uses under consideration are designated; and the availability of resources for that maintenance and administration. For an item by item accounting of how the Three Trails OHV Project meets the requirements of the Travel Management Rule, reference page 447 in the DEIS. |
| **25-31** | ***<u>Little Deschutes River</u>***<br>***A portion of the Little Deschutes River within the Three Trails Planning Area upstream of the Two Rivers Subdivision is designated as a Wild and Scenic River. OHV use within the Wild and Scenic River corridor was restricted via the 2001 Big Marsh Creek and Little Deschutes River Wild and Scenic River Plan. Yet despite this restriction, we have documented a high rate of non-compliance among OHV riders. Several recent user-created ATV trails exist within the Wild and Scenic River corridor immediately south of the Two Rivers North subdivision, including an illegally-constructed bridge that spans the Little Deschutes River and provides access for OHVs and winter snowmobile use. Not only is the bridge adversely affecting riparian vegetation, but use of this bridge by OHVs is resulting in increased sediment entering the river, particularly from the approach on west river bank. With each season that passes, the likelihood of a vehicle accident and spillage of gasoline and oil into the river increases, given the deteriorating condition of the make-shift bridge. Therefore, removal of the illegal bridge and rehabilitation of the riparian and upland vegetation should be among the agency's highest priorities.***<br><br>Response: Thank you for bringing this situation to the Forest Service's attention regarding the user-created crossing. If this is one the Forest Service is unaware of, it will be a priority for removal. The Three Trails OHV analysis has been an opportunity for the agency to focus attention on the Three Trails OHV project area, including the Wild and Scenic River. The Action Alternatives would close and rehabilitate between 56 to 95 miles of user-created trails (DEIS, Table 45 page 63). This includes many restoration activities that would occur within the Wild and Scenic River corridor, including one known user-created stream crossing that exists upstream of the community of Two Rivers North on the Little Deschutes River. This crossing is made of a few stringer logs. Page 415 of the DEIS outlines a detailed |

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| | safety, education, enforcement, and maintenance plan. Coupled with monitoring, the Wild and Scenic River and its Outstandingly Remarkable Values would have improved protection with this project. Having an enforcement presence on the ground encourages public awareness of responsible use, increases compliance with OHV rules and regulations, and promotes the protection of natural resources within the recreation areas of central Oregon. An increased presence of law enforcement officers at the staging areas, on the trails, in the dispersed riding areas, and with overflights, gains rider buy-in to the rules and regulations, and reduces acts of violence, violations, and other related offenses. Law enforcement officers support trail and riding ethics and promote OHV education, which relates to the safety of the trail users. A law enforcement presence allows for faster response times to accidents, emergencies, search and rescues, and violations. |
| **25-32** | ***<u>Walker Rim Unroaded Area</u>***<br>***We would strongly oppose the construction of a new OHV trail in the Boundary Springs area, as identified in Alternative C. The DEIS states that Alternative C "would construct 0.89 miles of OHV trail adjacent to approx. 5,000 acres of relatively steep Walker Rim which is bisected by a few roads" (DEIS, p. 118). Yet the DEIS analysis is misleading and flawed by claiming "there would be no construction of roads" along this portion of Walker Rim. Not stated in the DEIS text is that the proposal would be to construct a route designated for use by full-size (Class II) vehicles and link two existing open Maintenance Level 2 roads. For all intents and purposes the proposed "trail" would function like a road, enabling full-size passenger vehicles "to form a route along the rim" (DEIS. p. 118). We also believe the DEIS analysis to be flawed when it concludes that this portion of Walker Rim does not meet criteria for potential wilderness.***<br><br>Response: The Forest Service has reviewed the citizen-identified "Oregon Proposed Wilderness" map found on the Oregon Wild website. Layered onto the forest transportation layer, there are numerous Level 1 and 2 roads present. This area also overlaps an area where approximately 218 miles of legacy roads inherited from a land exchange would be closed. The only trail construction in this area is proposed in Alternative C, is adjacent to the steep portion on Walker Rim, and the area of concern from the commenter has numerous existing roads and user-created trails. The 0.89 miles of trail would simply provide connection between an existing Maintenance Level 2 road and user-created trails. This trail construction would be more than offset by closure and rehabilitation of other roads and trails in the area. There would be no construction of new roads anywhere in the project area. The Forest Service meets the commenters concern for potential wilderness inventory - as per the Forest Service Handbook 1909.12 Chapter 70 section 71.1 which outlines the Forest Service criteria to be applied to meet the requirements for inventory of potential wilderness. Essentially, these criteria are limited to size requirements and presence of roads; however the Forest Service also looked at the effects of trail construction for (2.a) areas that can be preserved due to physical terrain and natural conditions, (2.b) Areas that are self-contained ecosystems, such as an island, and (2.c) Areas that are contiguous to existing wilderness, primitive areas, or potential wilderness in other Federal ownership, regardless of size. Walker Rim does not meet these three criteria as explained on page 118 of the DEIS: "Because of active forest management surrounding the area, a well-roaded portion below the rim and the lack of potential to manage the portion as a separate island of a self-contained ecosystem, trail construction activities do not occur in areas that qualify as potential wilderness according to FSH 1909.12 Wilderness Evaluation. Also, as the project is designed, it does not preclude the steep and unroaded section of the rim from potentially being considered for potential wilderness in the future. " |
| **25-33** | ***<u>Black Rock Unroaded Area</u>***<br>***According to the DEIS, the only new OHV trail construction that would occur in or adjacent to areas*** |

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| | ***that have potential to meet the Forest Service's criteria for wilderness potential would occur within the Black Rock lava flow (DEIS, p. 118). Alternative C and E (the Preferred Alternative) propose to construct approximately four and two miles of trail, respectively, around the edge of Black Rock lava flow to utilize existing user-created routes that link with an existing road system and a mineral extraction pit. The DEIS notes: "There are no existing roads or trails within the relatively undisturbed 700-acre interior of the lava flow." What is not stated is whether the proposed OHV routes would extend into the interior of the lava flow or whether any of the proposed OHV routes would occur in currently unroaded areas.***<br><br>Response: No OHV routes would be constructed in the interior of the lava flow. Page 294 of the DEIS reiterates this by stating: "This is due to the placement of OHV trails adjacent but not on the Black Rock lava flow. Project design and trail construction would route trails off the lava formations so there would be no driving over rock in any alternative." Since this would be a Class II trail, the DEIS incorrectly stated the trail would be 50 inches wide, instead of "greater than 50 inches wide." The FEIS has been corrected.<br><br>The full text on page for page 118 in the DEIS: "Because of active forest management up to the lava flow and a well roaded surrounding system of roads, plus the lack of potential to manage the portion as a separate island of a self-contained ecosystem, trail construction activities do not occur in areas that qualify as potential wilderness according to FSH 1909.12, Chapter 71, Inventory. Also, as the project is designed, it does not preclude the lava feature from being considered for potential wilderness in the future." |
| **25-34** | ***Although trail construction is stated in the DEIS to be 50 inches wide, maps for Alternative E depicts a series of Class II (Jeep) "trails" on the north and northwest flanks of the Black Rock area plus a shared use motorized "trail" (Classes I, II and III) that traverses the western side of the lava flow and terminates within a short distance with no apparent destination. We see no reason to construct this short trail segment and the DEIS provides no rationale for its designation or use.***<br><br>Response: Alternatives C and E would construct approximately four and two miles of trail (respectively) around the edge of Black Rock lava flow to take advantage of existing user-created roads and trails that link with an existing road system and the mineral extraction pit (DEIS page 118). The termination with no apparent connection was a mapping error and has been corrected in the FEIS. All trail miles and the effects based on those miles were discussed in the DEIS. |
| **25-35** | ***Despite the fact that full-sized passenger vehicles would be authorized on OHV "trails" that traverse the edge of Black Rock lava flow, the DEIS claims there would "be no construction of roads." We view this distinction as arbitrary and we disagree with the conclusion that constructing such routes "would not occur in areas that qualify as potential wilderness." We also disagree with the implication that the presence and use of these OHV routes "does not preclude the lava feature from potentially being considered for potential wilderness in the future" (DEIS, p. 118). More realistically, the agency would be hesitant to again consider the Black Rock lava flow for its wilderness potential once its action to designate OHV use spawned a constituency that would actively opposed any such action. To imply the agency would not be precluded from considering the landscape's wilderness potential in the future appears to us to be disingenuous.***<br><br>Response: See responses 25-33 and 25-34. The final Travel Management Rule, in the response to comments, clarifies that the difference between roads and trails are defined by vehicle width and |

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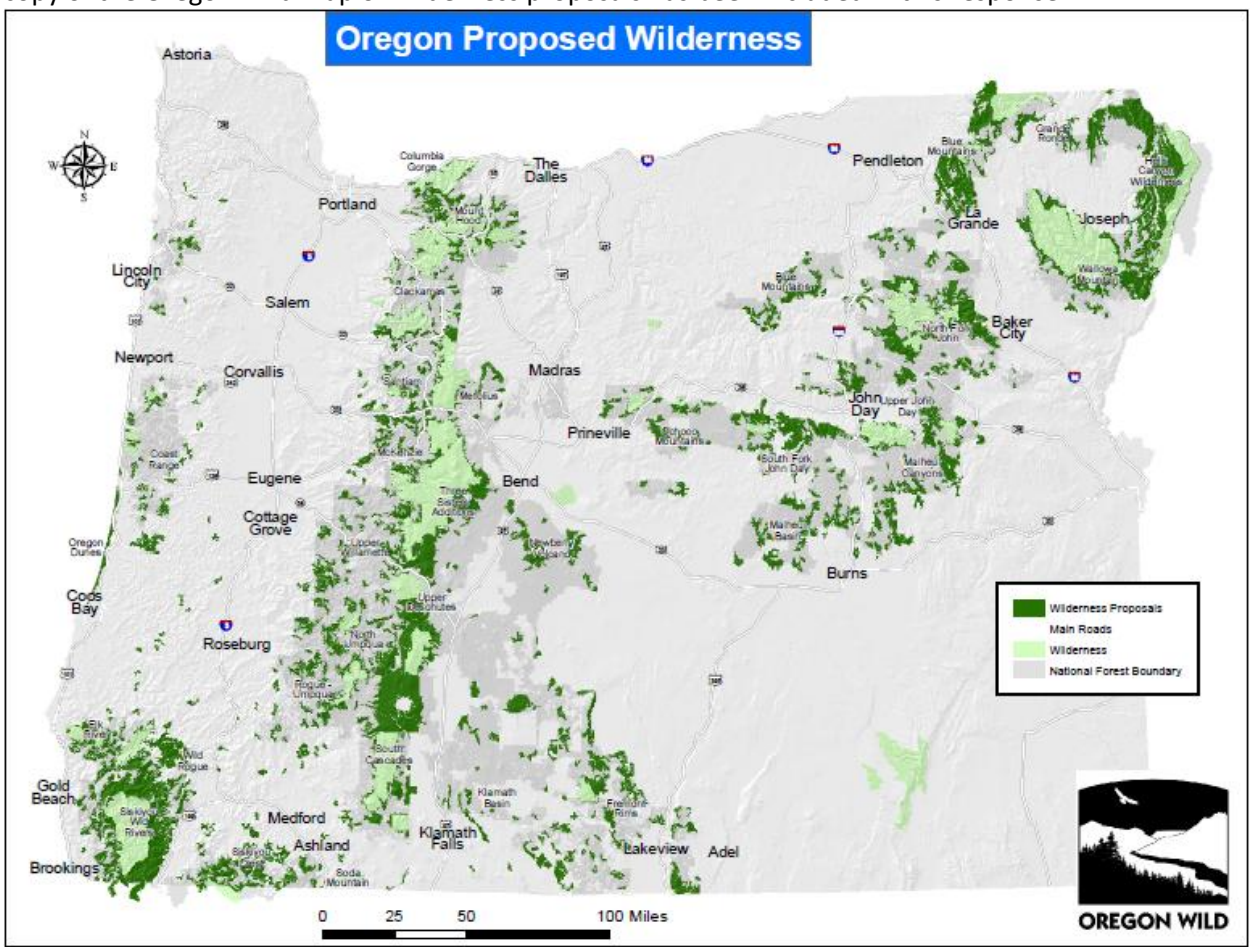
| | management. The Three Trails OHV Project DEIS/FEIS clearly defines that the portions of the designated trail systems designed for vehicles greater than 50' in width would be managed as motorized trails. |
| **25-36** | ***…the DEIS does not analyzing [sic] the potential impacts of OHV routes proposed within or near the Odell Creek Roadless Unit. We could not locate a map to depict how the action alternatives might affect this roadless area that has been proposed by Oregon Wild for designation as wilderness.***<br><br>Response: The Forest Service has reviewed the Oregon Wild proposed wilderness area along Odell Creek and it would have been helpful for the commenter to provide these maps as the website is lacking in detail sufficient to respond in greater clarity. Odell Creek is outside the Three Trails OHV project area and the nearest trail system is approximately one mile away at Crescent Lake Junction along the railroad tracks where a system of user-created trails and Maintenance Level 2 roads already exist. The nearest Inventoried Roadless Area is Maiden Peak, and it is approximately three miles away from Odell Creek. A copy of the Oregon Wild map of wilderness proposals has been included in this response.<br>  <br> |
| **25-37** | ***The Forest Service violated the 2001 Roads Rule and Subpart A of the Travel Management Rule: The DEIS concludes with the following claim:***<br>"The responsible official has identified the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest Lands. This document is the roads analysis for the Three Trails OHV project area (DEIS, p. 447). "<br>***Yet the Minimum Road System (MRS) identified in the Preferred Alternative does not comply with the*** |

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| | ***2001 Roads Rule, which is now subpart A of the Travel Management Rule and has been re-affirmed in the Appropriations Act of 2009, 155 Cong. Rec. H2089-01 at H2110 (Feb. 23, 2009). The MRS neither complies with the requirements of the regulatory definition of an MRS, nor was it founded on a "science based analysis at the appropriate scale." In addition, the Forest Service did not alert the public that it was considering identifying and implementing a minimum road system via this OHV Project, denying the public an opportunity to comment on the MRS. Attachment 4 ( Roads Analysis and Minimum Roads System) to this letter described these claims in greater detail.***<br><br>Response: See response to comments 25-4 and 26-1. The Three Trails OHV Project is consistent with the Travel Management Rule and has met the requirements of Subpart A and has met the intent through the NEPA process. The scoping letter, public meetings, and website clearly identified access management as part of the decision and invited the public to comment for which the Forest Service received many responses regarding which roads to close, and which not. |
| **25-38** | ***Far ranging species including Lynx, Wolverine, and Wolf have been periodically reported in the region's forests. These species were historically present, and may at times be present within the project area. However the EIS fails to reasonably address potential harmful effects from the proposed OHV systems to these wildlife species. Wolves have been documented returning to Oregon, with unconfirmed reports of wolves in the Oregon Cascades. The EIS fails to adequately address the potential direct and cumulative impacts of the proposed OHV trail systems to these and other species of concern. The OHV route system and associated management provisions may delay, hinder, or otherwise impede recovery of these ESA, state, and regional listed protected wildlife species and species of concern. These and other species of concern are addressed in more detail below. The project NEPA documentation needs to be revised, to disclose and address likely and potential direct and cumulative impacts to these and other species, with provisions incorporated within proposed alternatives for the recovery, protection, and sustainable viability of federal and state listed wildlife species and regional terrestrial and avian species of concern.***<br><br>Response: Effects to Threatened, Endangered and Sensitive species are addressed beginning on page 159 of the DEIS. There are no established packs or reproducing pairs of wolves on the Deschutes National Forest. Therefore, there currently is no need to analyze the effects to wolves or consult with the Fish and Wildlife Service at this time. The Fish and Wildlife Service has been informally consulted and has advised the Forest Service in responding to this comment.<br><br>The Deschutes National Forest and specifically the Three Trails OHV Project Area does not have the habitat for lynx based on current habitat definitions. |
| **25-39** | ***Wildlife species considered "more common" are insufficiently addressed and largely omitted from the analysis, despite the strong likelihood of direct and cumulative disruptive and harmful consequences to these species, their prey species, and potentially to human recreationists and adjoining private lands residents. Among these species are Cougars, Bobcats, and Black Bears; all of which would be subject to intrusive disturbance to their territories and core habitat. OHV disturbance as proposed is pervasive across the project area, lacking in significant core wildlife areas where motorized disturbance is not permitted that are sufficiently distant from intrusive noise and direct impacts.***<br><br>Response: Effects to generalist species such as cougars, bobcats, and black bears would be covered under the same effects as expressed for carnivores dependent on solitude and large home ranges, such as wolverines (page 200 of the DEIS) and the Pacific fisher (page 180). Both were analyzed with |

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| | disturbed and undisturbed habitat and prey as a measure. 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; Rowland et al. 2005; DEIS page 152). For the wolverine and Pacific fisher, it was determined the control of access in place of the current unregulated cross-country travel would have no effect or even benefit some aspects of their life cycles. |
| **25-40** | ***The EIS fails to meaningfully address recovery objectives for federally listed species and regional species of concern. The EIS fails to incorporate effective management provisions to ensure OHV activity and use of the Forest travel system does not prevent or diminish recovery of affected wildlife and avian species in the greater project planning area.***<br><br>Response: The DEIS had a robust discussion and disclosure of effects by alternative to federally listed species and species of concern starting on page 159. |
| **25-41** | ***Under the proposed action alternatives there are many associated impacts that incrementally and irretrievably degrade natural habitat quality and connectivity, adversely affecting the recovery and viability of ESA and state-listed species and regional species of concern that have not been sufficiently disclosed or addressed in the EIS. Among these are direct OHV intrusions into and near important hiding and rearing cover and refugia; as well as excessive levels of noise, exhaust, erosion, airborne sedimentation (dust), and disturbance extending throughout much of the area's forest habitat.***<br><br>Response: See response to 25-40. In addition, noise was addressed for several species starting on page 150 (including hearing loss and decrease in sound sensitivity), as well as for effects to quiet areas such as wilderness on page 103 where it was used as a Key Issue measure. Air quality, or exhaust/fugitive dust and the effects are disclosed on page 432. Erosion is discussed in Soil Quality starting on page 126 and Aquatic Resources on page 320. Fugitive dust is also discussed in those sections. The wildlife effects are predicated on a 200 meter road effect distance (assumptions, page 154). |
| **25-42** | ***While the EIS presents a multi-page appearance of analysis regarding some of these species, the species status disclosures, impacts assessments, and proposed OHV system alternatives fail to reasonably acknowledge and responsibly prevent the level of irreparable habitat degradation and adverse direct and cumulative impacts that would result from the implementation of any of the proposed OHV system alternatives.***<br><br>Response: This comment is not specific enough to address. However, a full disclosure effects to wildlife species by alternative, along with cumulative effects can be found starting on page 171 of the DEIS. |
| **25-43** | ***Legally, the EIS must present the know[sic] forthcoming TMP changes as the comparative environmental baseline on which to assess the impacts of the proposed OHV system alternatives upon wildlife, aquatic species, forest ecosystems, and salmonid water systems. Under such comparison, with the TMP management provisions as the baseline, all action alternatives represent significant irreparable adverse impacts including extensive habitat degradation and disruption to wildlife, aquatic, and botanical species and the natural environment.***<br><br>Response: See Response 25-10. The affected environment (aka existing condition) shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration (40 CFR 1502.15). Currently there is no Travel Management Rule in place and the effects were analyzed in the appropriate scale and intensity. Further, "…the final analysis documents an agency |

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| | assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment (36 CFR 220)." The Three Trails OHV project document refers to the Travel Management Rule and Travel Management DEIS nearly 100 times as a foreseeable action as defined in 36 CFR 220.3, definitions. |
| **25-44** | ***The EIS fails to provide a range of alternatives that substantively minimize the level of harmful impacts, including action alternatives that restrict the level and extent of OHV use. The EIS fails to develop action alternatives that prohibit OHV use including noise impacts in core habitat areas, connective areas, water systems, and natural recreation areas. Such an alternative would be more in keeping with the recommendations of the Travel Working Group, Conservation organizations, and the Oregon Department of Fish and Wildlife. Responsible alternatives would recognize the importance of protecting the significant majority of the 93,000 acre analysis area from OHV motorized impacts and disturbance harms. Ecologically viable alternatives would restrict OHV use to a significantly reduced scale of already degraded locations audibly far-distant from active (and future) habitat for the region's many listed species and species of concern. Recreationally responsible action alternatives would prohibit noticeable OHV impacts (including noise and dust plumes) within range of natural recreation and natural habitat areas, and would consider more ecologically compatible natural recreation options throughout the analysis area. Instead, the EIS presents widespread OHV trail systems that preclude natural recreational opportunities by degrading and disrupting the natural environment, and that jeopardize the viability of numerous already imperiled wildlife and other native species.***<br><br>Response: See Response 25-16. The Responsible Official does not have to analyze an infinite range of alternatives, only a reasonable number depending on the nature of the proposal (CEQ's 40 most asked questions) and 36 CFR 220.5(e) for a definition of a reasonable range of alternatives. The Three Trails OHV project has satisfied this requirement. It considers five alternatives and explains why other alternatives were not analyzed in detail (DEIS, pages 30 and 59, respectively). |
| **25-45** | ***Open road and trail density will be reduced to 2.8 mi/sq. mi. (Alt B), or 2.5 mi/sq. mi. (Alt C, D, E). This is based on road and trail densities in 16 6th field watersheds covering 162,000 acres of which the project boundary covers only 93,000 acres (57%) (267 & 389 table 110). What is needed here is either a consistent analysis expansion to address cumulative conditions across the entire 162,000 acres, or more responsibly, an accurate disclosure of actual road and trail densities per square mile within the 93,000 acre analysis area alone. Expanding the scale of the road and trail density area disproportionately dilutes the actual road density levels, misrepresenting these to the reviewing public and decision-maker.***<br><br>Response: It is unclear what the commenter is asking for: "…consistent analysis expansion to address cumulative conditions across the entire 162,000 acres, or more responsibly, an accurate disclosure of actual road and trail densities per square mile within the 93,016 acre analysis area alone." Starting on page 382 of the DEIS, the Transportation section in Chapter 3 provides a breakdown of road densities (including public and private) and public roads (Forest Service only) by all 16 subwatersheds. |
| **25-46** | ***The EIS discloses that there are no acres greater than 1 mile from an open motorized route within the 93,000 acre project area (267). However, the EIS fails to address the harmful consequences to wildlife of this current condition, fails to assess population and distribution trends for affected wildlife species, or address the cumulative impacts to wildlife from authorizing the long-term continuation of this condition with designated OHV trail systems.*** |

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| | Response: Page 267 and Table 81 shows that under the existing condition, distance banding analysis showed there is no National Forest System land greater than one mile from an open motorized route in the project area resulting in no high quality security cover particularly for elk. This has been disclosed for all the action alternatives even though each action alternative has a range of reduced road densities through road closure. Although the commenter is citing an analysis uniquely tailored to elk, this methodology of distance banding was analyzed for all wildlife species on page 154. |
| **25-47** | ***The EIS claims that within 660 feet of an open motorized route, hiding cover occurs on 63% to 69% of those acres, depending on Alt. However, this is misleading. Reasonably foreseeable future actions, including projects currently in their planning development that are likely to soon have implementing decision, would reduce existing cover to only 10% for "black bark" ponderosa pine stands and just 30% for other forest stands (283). The EIS fails to address new scientific research on affected wildlife species that demonstrates that the sorely outdated Forest Plan's minimum hiding cover standards of 10% and 30% are incapable of providing for wildlife species needs and long-term viability. The EIS also fails to adequately address additional losses of important wildlife cover, including that which would be eliminated along roads identified as routes for wildfire evacuation (267).***<br><br>Response: See response to 14-6. Page 283 of the DEIS acknowledges the planned vegetation activities in Rim-Paunina, concluding the activities would likely result in a reduction of hiding cover and short-term disturbance. The analysis for the Rim-Paunina project is not complete; therefore specific details on the amount of hiding cover by action alternative are not available at this time. The Three Trails OHV Project has disclosed Reasonably Foreseeable Actions as detailed as possible.<br><br>The commenter's reference to thinning black bark ponderosa pine stands does not apply to this project and may be incorporating a response to another project. It is unclear which "new scientific research" is applicable. All known past, present, and reasonably foreseeable actions have been incorporated into the analysis. It is also unknown which wildfire evacuation routes and subsequent additional losses of cover for which the commenter has referenced. |
| **25-48** | ***Open roads within Riparian Habitat Conservation Areas will be reduced 18% to 27% depending on the Alt. (62.5 miles existing reduced to 51 miles to 45.4 miles proposed to remain) (344). However, the EIS does not differentiate between TMP changes and Three Trails provisions, nor does it adequately address the lack of effectiveness of many of the closure methods to be employed. The EIS fails to acknowledge that closed roads, if not returned to natural forest contours and vegetation, continue to function ecologically as roads, contributing to adverse road density affects fragmenting wildlife habitat and degrading the quality of available wildlife territory.***<br><br>Response: Currently there is no Travel Management Rule in place and the effects were analyzed in the appropriate scale and intensity. Page 347 of the DEIS: "All road closures would be physically closed, periodically monitored for proper hydrologic function, and removed from the NVUM map. No obliteration would occur on Maintenance Level 1 or 2 roads." The Action Alternatives would allow for less complicated enforcement efforts by LEOs and FPOs (and thus more effective) when they encounter OHVs outside the proposed roads, trails, and area. Anyone outside the proposed OHV roads, trails, and area would be in clear violation with regard to possessing a vehicle off the road. The Action Alternatives would make it more difficult for those willing to build unauthorized trails outside the proposed OHV roads, trails, and area. This is due to the fact that they typically use OHVs to carry equipment out to areas where unauthorized trail building is taking place. This in turn makes it easier to track anyone |

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| | conducting this type of unauthorized activity (page 416, DEIS). Given the education, monitoring, and enforcement plan in place for the Three Trails OHV area, closure of roads within the project area would be highly effective. The Soil Quality (page 126), Aquatic Resources (page 347), and Transportation sections (page 382) address ecological functions associated with roads.<br><br>The Travel Management DEIS does not close any existing motorized routes. Therefore, the Three Trails Ohv Project goes beyond those activities discussed in the Travel Management DEIS and closes routes in riaparian areas to motorized travel. |
| **25-49** | ***On average, for the wildlife species assessed, 50% or more of their habitat will be disturbed (habitat within 660' of an open road – 221, 227, 230, 232, 238, 244, 247, 249, 252, 256, 258, 260, 287, 292). The EIS excuses this by claiming that this is less than the current average disturbance of 75%. However, again the EIS misrepresents "no action" baseline conditions, failing to acknowledge coming TMP changes and conditions. The 75% figure provided in comparison inexcusably includes the continued illegal OHV use of closed (level 1) roads (33% 343 miles of FS roads (385 & 452).***<br><br>Response: See response for 25-48. Currently, OHV use of Level 1 roads is not illegal in most places. |
| **25-50** | ***…the EIS should have presented the range of differences between an enforced TMP no action baseline and current unenforced and open OHV conditions. Further, this issue should be addressed in depth within the EIS in developing effective enforcement capabilities to meet the challenges of enforcing both the TMP and Three Trails actions.***<br><br>Response: See response to 25-48. An alternative was considered that made a trail system from shared-use roads only (page 61, DEIS). The FEIS would have another alternative considered that would prohibit cross-country travel without a designated trail system. Neither meet the Purpose and Need for the project because they they did not provide for a suitable trail system. Thus, they were eliminated from detailed analysis. A detailed discussion of enforcement capabilities is found on page 413 of the DEIS. |
| **25-51** | ***The EIS claims that currently, by both the types of use and associated values, non-motorized use and quiet recreation overlapping the Three Trail OHV project area are low to non-existent during summertime (86). This represents a rather contrived misuse of conditions that could apply to almost the entire forest outside of wilderness, or 88%* of the forest! The EIS assumptions here fail to be based on the actual use of area forests. Nor do they acknowledge that in areas where a few OHV riders tend to operate, the majority of the public desiring a natural recreational experience are largely driven elsewhere as a consequence of the OHV noise and degradation. *Approximately 88% of the forest outside of wilderness areas is within ½ mile of an open road (Travel Mgmt DEIS 218)***<br><br>Response: The analysis only applies to the Crescent Ranger District and specifically the Three Trails OHV Project area. It was determined using site-specific knowledge of recreation specialists who are skilled at how visitors are using the Ranger District and local knowledge from long-term residents. These assumptions were added to the FEIS on page 89. |
| **25-52** | ***In the next 10 years, the activities with the greatest predicated growth (in terms of total participants multiplied by percent change) would be <u>viewing/ photographing wildlife/birds</u>, general relaxing, viewing other features, hiking/ walking, <u>fishing</u>, and driving for pleasure (89). The major focus of these activities are natural recreation founded in the natural qualities of the forest environment. As such, instead of proposing to authorize widespread OHV disturbance and impacts throughout the*** |

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| | ***entire 93,000 acre planning area, it would be far more in the public interest to meet the growing needs for natural recreation which also provides for the maintenance of the natural forest environment, and the recovery of forest dependent native species.***<br><br>Response: OHV riders enjoy the natural environment and utilize their OHVs to access areas where they can enjoy these activities as well. There was no attempt to break out the resource by motorized versus non-motorized because 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 (DEIS, page 74).<br><br>Part of the Purpose and Need for this project was to design a reasonable and sustainable trail system that addresses rider's experiences related to the change in motor vehicle access with the eventual implementation of the Travel Management Rule. The 2005 Travel Management Rule states, in part, that the Forest Service "must strike an appropriate balance in managing all types of recreational activities. To this end, a designated system of roads, trails, and areas for motor vehicle use established with public involvement would enhance public enjoyment of National Forests while maintaining other important values and uses of NFS [National Forest Systems] lands" (Federal Register, November 9, 2005, page 68265; DEIS page 75). This project is one of three additional OHV trail systems proposed on the Deschutes and Ochoco National Forest by a process that identified areas of limited public support for a designated OHV trail system. This process followed a series of public meetings by a diverse group of citizens representing a wide range of opinions on how OHVs should be used on National Forest lands. |
| **25-53** | ***If OHVs are to be permitted within the forest ecosystem at all, given their lack of compatibility with the natural environment and their preclusion of natural recreation qualities, to provide for the greatest public interest OHV use should be restricted to limited areas where existent (sic) disturbance has already largely removed and impaired the natural environment, and where their noise impacts cannot be audibly heard by not only humans but by imperiled wildlife species as well within their territorial habitat. Such suitable locations within the planning area are largely limited to select locations along the railroad tracks and major highway thorough fares, where past logging, road building, and development have irreparably altered the character of the natural environment. Beyond these limited areas, there really does not exist any suitable place for OHV use.***<br><br>Response: See response 25-52. The Travel Management Rule states, in part, that the Forest Service "must strike an appropriate balance in managing all types of recreational activities. To this end, a designated system of roads, trails, and areas for motor vehicle use established with public involvement would enhance public enjoyment of National Forests while maintaining other important values and uses of NFS [National Forest Systems] lands" (Federal Register, page 68265; DEIS page 75). Areas were identified by a chartered working group of citizens (DEIS page 75 and 137) and the designated motorized trail system was designed to put the trails in more ecologically suitable and sustainable locations (DEIS page 22 Purpose and Need, page 448). |
| **25-54** | ***Three Trails OHV participants are predicted to increase annually between 2.5% (48% in 10 years) to 5.6% (72% in 10 years) (92). However, these predictions fail to acknowledge that OHV use hit a stasis level a few years ago, and has since declined in levels of motorized participants with the continued economic downturn, perhaps coupled by an overall increased appreciation of the natural environment among recreationists. As such, the purported "need" for the proposed systems stated in the EIS fail the accuracy, scientific integrity, and environmental quality requirements of the NEPA.*** |

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| | Response: Page 75 of Recreation Section in the DEIS: "OHV use today, however, is among the fastest growing outdoor activities. Although the economy over the recent years has likely affected the recent dip in OHV use and sales locally and nationally, it is believed the overall trend for increase in use would continue." The State of Oregon in "*The Oregon Trails 2005-2014: A Statewide Action Plan*" identified the South Central Planning area (Klamath and Lake Counties, which includes the Three Trails OHV planning area), as the top regional motorized trails plan issue with a need for more designated motorized areas to accommodate OHV enthusiasts in the region" (DEIS page 75). Besides this empirical data from the State of Oregon, the Responsible Official used other important local factors in determining the need. This is also in accordance with our Deschutes Land and Resource Management Plan Standard and Guideline TR-20: "The Forest will work with the State All Terrain Vehicle committee on the planning and construction of Off-Highway Vehicle (OHV) trails and facilities" DLRMP 4-33. |
| **25-55** | ***Due to OHVs lack of restriction to existent roads and paths, they represent a far greater threat with which most affected wildlife species are instinctively cognizant. As such the "apples = oranges" comparisons, assumptions and conclusions found in the EIS attempting to equate OHV disturbance impacts in similarity with trains and road vehicles lack the requisite scientific foundation and fail the accuracy and "hard look" requirements of the NEPA. In short, OHVs have far greater adverse impacts and long-lasting repercussions upon wildlife species. OHV use jeopardizes wildlife security, alters movement patterns, increases wildlife vulnerability, disrupts and diminishes foraging and hunting, and requires greater expenditures of wildlife energy that are not easily replenished. The EIS fails to adequately and accurately address the multiple levels of significant harms that OHV use inflicts upon wildlife and the natural environment. Authorizing widespread OHV use and noise impact levels that affect wildlife and natural environmental qualities throughout the entirety of the 93,000 acre planning area as proposed not only is unconscionable, it violates the core tenets of the NEPA and the clear requirements of the NFMA.***<br><br>Response: The commenter has not provided specific evidence that species have not had the "hard look" test applied, nor has contradictory science been presented. National Environmental Policy Act requires that each project per 40 CFR 1502.1 "...It shall provide full and fair discussion of significant environmental impacts and shall inform decision-makers and the public of the reasonable alternatives which avoid or minimize adverse impacts or enhance the quality of the human environment." This project is in compliance with the Act as it focuses on areas that are currently being most heavily visited by riders and the alternatives direct the use to the most suitable and sustainable places on the landscape within the 93,016 acre Three Trails OHV project area (DEIS page 22 and 448). Each resource is discussed in their appropriate context and intensity under existing condition and cumulative effects (DEIS, Chapter 3 starting on page 74). Consistency with the 1990 Deschutes National Forest Land and Resource Management Plan is found starting on page 450 of the DEIS. |
| **25-56** | ***OHV use is proposed within and adjacent to important wildlife habitat locations including Muttonchop Butte, Walker Rim, Black Rock, Oregon Cascades Recreation Area, Diamond Peak Wilderness, pg. <118>.... The EIS discloses that an OHV trail exists within 1/10th of a mile from the Diamond Peak Wilderness Boundary, erroneously equating the existence of a railroad line and area roads with the far different and substantively more disruptive impacts of OHV use…***<br><br>Response: No activities would occur within the boundary of the Oregon Cascade Recreation Area (OCRA), Wilderness, Inventoried Roadless, or Potential Wilderness Areas. Both the Diamond Peak and Mt. Thielsen Wilderness boundaries are also well roaded along the boundary shared with the Winema |

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| | National Forest and at Crescent Lake. There are no designated OHV trails within Diamond Peak or Mt. Thielsen Wildernesses (DEIS page 31, 113). There are no existing roads or trails within the relatively undisturbed 700-acre interior of the Black Rock lava flow (DEIS page 118). Project design and trail construction would route trails off the lava formations so there would be no driving over rock in any alternative (DEIS page 294). The effects of the portion of the designated trails system within 1/10 of a mile of the Diamond Peak Wilderness is discussed extensively in the Recreation section in Chapter 3 of the DEIS, including a thorough analysis related to adjacency factors. Disturbance to wildlife on Walker Rim, Muttonchop Butte, and Black Rock is discussed starting on page 148 of the DEIS. |
| **25-57** | ***…the EIS misuses inappropriate comparisons equating road proximity to the OCRA and other ecologically important locations with the effects of its planned OHV trail systems. Additionally, the agency's well-established inability to enforce trail system use-regulations and prevent off trail incursions into wilderness, National Monument (as occurs in the Newberry Monument area for example), and other prohibited locations raises serious question on agency plans that would bring OHVs into close proximity and easy access to these treasured ecologically important locations, far from enforcement capabilities to prevent OHV trespass.***<br><br>Response: A disclosure of effects for the Oregon Cascades Recreation Area is found on page 113 of the DEIS. It was determined the opportunity to hear and see motorized vehicles would not appreciably change from the current condition. Implementation of action alternatives would encourage motorized travel on designated routes, which are generally located away from any OCRA or Wilderness boundaries where sounds would be detectable. By designation of routes, monitoring and enforcement of incursions into unroaded areas would likely be more efficient because of more defined areas where riders can and cannot be and more focused patrols. A detailed law enforcement plan can be found on page 413 of the DEIS. Designated OHV areas provide opportunities for funding for law enforcement and education not provided in undesignated areas. |
| **25-58** | ***Allowing OHVs anywhere within audible noise, dust, and disturbance impacts to the Black Rock, Muttonchop Butte, OCRA, Diamond Peak Wilderness, Walker Rim, and other old growth and ecologically important habitat locations would harm already vulnerable wildlife species, irreparably degrade existent habitat and natural recreation qualities, and violate the intent and direction of federal environmental policy laws.***<br><br>Response: Effects to wildlife habitat, including those at Black Rock, Muttonchop Butte, OCRA, and Walker Rim can be found starting on page 148 of the FEIS. Effects to OCRA and the Diamond Peak Wilderness can be found starting on page 88 of the DEIS. Muttonchop Butte, Walker Rim and other areas on the District are already experiencing OHV use. The Purpose and nNeed for the project states "*There is a need to provide for a designated trail system where there is some community support on the Crescent Ranger District in a suitable and sustainable*[85] *location while considering other forest uses."* (DEIS page 22). The action alternatives put the designated trail system in suitable and ecologically sustainable location while closing and rehabilitating between 56-95 miles of user-created trails (DEIS Chapter 2). Chapter 3 contains each resource discussed in their appropriate context and intensity under existing condition and cumulative effects (DEIS, starting on page 74). It is unclear which Federal environmental policy laws the commenter believes are violated. |

[85] Sustainable locations are those in the least sensitive areas with larger tolerance to motorized use over time, such as upland/drier sites with the least resources that have a relatively low threshold to habitat modification.

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| **25-59** | ***The No Action Alternative (A) includes closed roads (level 1) as being used by OHV riders, yet fails to include an alternative that would show the open road and trail density tied to the soon to come Travel Mgmt DEIS decision wherein cross-country travel and level 1 roads would be closed;***<br><br>Response: See Responses to 25-43 and 25-50. The commenter mischaracterizes the proposed Travel Management DEIS actions. The Travel Management DEIS does not close any roads not already closed by past decision, it only proposes to prohibit travel off of designated open system roads, nor does it in any way modify the existing open road density. The Three Trails OHV Project action alternatives by comparison, reduce the overall open road density across 16 watersheds. |
| **25-60** | ***The EIS contains varied information concerning changing OHV recreational use patterns. Information disclosed regarding recreational participation on the DNF revealed that OHV use was only a diminutive 2.1% relative to other uses (76). Importantly however, the EIS failed to provide a reasoned assessment regarding how the proposed OHV system alternatives would affect other recreational uses currently or in the future, particularly the six activities expected to increase the most in the next 10 years. These include viewing/photographing wildlife/birds, and fishing (see above). Similarly, the EIS misrepresents area use patterns and conditions by its inappropriate use of road density levels to claim that "quiet" recreation is non-existent within the Three Trails Area during the summertime (86 …, 428, 448-450). Instead, while OHV disturbance may be considerable at varied times within the area, due to its relatively low number of actual users and narrow times of high OHV use, quiet recreation qualities are actually much more prevalent and cherished in the area than the EIS acknowledges. Overall the EIS fails to responsibly address the actual impacts of its excessive levels of proposed OHV activities on both existent and future quiet recreation opportunities.***<br><br>Response: The commenter has not provided any scientific basis for their assertions of "low number of actual ohv users, narrow season of use, and cherished quiet recreation areas." Non-motorized uses and quiet recreation are addressed throughout the Recreation section and specifically page 105 of DEIS. The National Forests are lands where the public enjoys many forms of recreation motorized or non-motorized. This DEIS does not attempt to break out the resource by motorized versus non-motorized because 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 (page vii, DEIS). |
| **25-61** | ***Not all FS acres are the same. Waterways and lakes, old growth, roadless, and refugia habitats and connective habitat to these rises in ecological importance above areas that have been highly degraded by past and ongoing management and development. The EIS failed to consider and develop an alternative that created a trail and road system open to OHVs (99 db) that was at a minimum 90% +/- one or more miles from these important ecological features. Such an alternative could have accommodated the range of predicted growth patterns for varied recreational activities in the next 10 years …, while better protecting habitat for many wildlife species associated with riparian habitat (428 & 448).***<br><br>Response: The commenter has not presented rationale or a scientific basis why this is an alternative to consider. One or more miles of National Forest land eliminated from waterways and lakes, old growth, roadless, and refugia habitats and connective habitat does not likely leave a suitable area remaining to engineer a trail system that also considers riparian areas, big game, cultural and other sensitive resources. Thus, it does not meet the Purpose and Need for a suitable trail system. The commenter is |

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| | also referencing the social and economic section where opportunity for motor vehicle recreation was a value expressed by a segment of the public that is important to maintain.<br><br>The commenter provide a request in a March 2, 2009 scoping letter on page 4 to provide "One or more alternatives, including the Agencies proposed action, should incorporate an objective of retaining natural quiet (to the extent of the Forest Service's control) in important landscapes, watersheds, or soundsheds." The DEIS has a thorough disclosure of how this project effects quiet recreation (DEIS, Recreation). The Purpose and Need was to provide for a designated trail system where there is some community support on the Crescent Ranger District in a suitable and sustainable location ***while considering other forest uses*** (emphasis added). The analysis found the action alternatives provide further separation of uses between the motorized and non-motorized communities, potentially providing a higher quality experience for the non-motorized visitor.<br><br>The Responsible Official does not have to analyze an infinite range of alternatives, only a reasonable number depending on the nature of the proposal (CEQ's 40 most asked questions). The Three Trails OHV project has satisfied this requirement. It considers five alternatives and explains why other alternatives were not analyzed in detail (DEIS, pages 30 and 59, respectively). Also 36 CFR 220.5(e) defines a reasonable range of alternatives. |
| **25-62** | ***The EIS failed to properly address how hiding cover and forest wildlife habitat features will change in the foreseeable future by current and known future projects, including the agency's focus on forest restoration. As these projects directly and cumulative affect habitat, forest ecosystem integrity, vegetation and soil communities throughout the project area, the failure to address this as part of the cumulative effects of the OHV proposal violates the NEPA. (407)***<br><br>Response: Hiding cover and associated cumulative effects are addressed in the Wildlife and Big Game section in Chapter 3 of the DEIS. |
| **25-63** | ***The EIS failed to provide a reasoned explanation pertinent to this OHV trail and road use project addressing "why" the 6th field watersheds with road and trail densities above 2.5 mi/sq. mi are not being reduced as part of this or a connected project to meet the LRMP road density guidelines within the project boundary.***<br><br>Response: The commenter is referring to the Forest Plan Standard and Guideline WL-53, and it only applies to open roads and trails are not included. Road densities outside of Forest Service jurisdiction can make up a large portion of a total road density within a watershed. However, if the target road density within Forest Service jurisdiction is over the target of 2.5 miles per square mile, there can be several reasons. Roads that provide access to private lands, County and State roads (Highways 58 and 97, County Road 61) can make up a significant portion of road densities, dependent upon how much they overlap into a particular watershed. Many roads are usually not available for closure, as well as other roads that provide access for recreation, suppression, and other resource management. The Three Trails OHV project has identified the minimum road system on the 93,016 acres that encompasses theThree Trails OHV project area, which is about one third of the Ranger District.<br><br>The total road density across the National Forest portion of the 16 subwatersheds is between 1.9 and 2.2 miles per square mile for the action alternatives compared with 3.8 for the No Action alternative; therefore we are consistent with Standard and Guideline WL-53. When OHV trails proposed are added to this, the action alternatives have between 2.5 to 2.8 miles of motorized routes per square mile |

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| | compared with 4.3 for the No Action alternative (DEIS, p. 273). |
| **25-64** | ***The EIS fails to develop provisions responsive to residents, seasonal visitors, merchants, forest workers (including mushroom pickers and other wild crafters), fishermen and others within the project area, capable of effectively preventing disturbance harms by OHV users, and effectively addressing potential complaints and conflict in current and ensuing years if the proposed widespread trail systems are allowed to be implemented as planned.***<br><br>Response: The commenter has provided a list of possible forest users and no information on how specific users or groups of users are using the area, may be affected by the proposed action, or (as already noted) on what kinds of specific provisions might be needed to address those effects. An extensive analysis of effects to and provisions to minimize impacts were addressed for residents, mushroom pickers, anglers, and other recreationists in the DEIS starting page 74 (Recreation) and page 423 (Social and Economic). The commenter's "potential complaints and conflicts" are highly speculative, and there has been no science provided upon which to base a meaningful response to this comment. The DEIS provides an education, enforcement, and safety plan on page 413. An extensive public involvement effort was accomplished for this project (page 25 of the DEIS). The commenter is not specific enough regarding which provision is not responsive and how the Forest Service can do a better job at serving its constituents. |
| **25-65** | ***The EIS claims that*** "*The goal of a successful enforcement program is demonstrated by a very high rate of user compliance*… " (415), ***however, such compliance has yet to be demonstrated anywhere on public lands trail systems….***<br>***Agency enforcement has yet to demonstrate that it can attain a reasonable degree of "user compliance" anywhere for an extended period of time, especially during high use seasonal periods. The EIS fails to properly disclose the actual levels of non-compliance or effectively address the infeasibility of enforcing current and proposed trail system regulations, relying instead of "feel-good" pretention rather than "hard look" reality. These analysis failures violate the requirements of the NEPA concerning EIS accuracy, integrity, and professional scrutiny.***<br><br>Response: The safety, education, and enforcement plan on page 413 of the DEIS was adopted from the Central Oregon Combined Off-Highway Operations (COHVOPS). According to the Central Oregon Combined Off-Highway Vehicle Operations, the enforcement program for existing designated motorized trail systems in central Oregon has been highly successful based on compliance with the East Fort Rock, Millican, and other COHVOPS-managed trail systems. It is unclear which requirements of NEPA concerning accuracy, integrity, or "professional scrutiny" are lacking. |
| **25-66** | ***…NFMA's regulations require inventorying and monitoring on the National Forests under 36 C.F.R. §§ 219.12(d) and (k) as well as 36 C.F.R. §§ 219.19(a)(6), 219.26, and 219.19(a)(2). The regulations state*** **"**each Forest Supervisor shall obtain and keep current inventory data appropriate for planning and managing the resources under his or her administrative jurisdiction.**"** ***Id*. § 219.12(d).** ***The regulations further require that*** **"**at intervals established in the plan, implementation shall be evaluated on a sample basis to determine how well objectives have been met and how closely management standards and guidelines have been applied." ***Id*. § 219.12(k).** ***To ensure biological diversity, the regulations specifically require that*** **"[**i]nventories shall include quantitative data making possible the evaluation of diversity in terms of its prior and present condition." ***Id*. § 219.26.**<br>***Although NFMA clearly requires the monitoring of MIS populations, the Forest Service has traditionally relied upon the availability of suitable MIS habitat, rather than population surveys, to*** |

***meet NFMA's viable populations requirement. Inland Empire Public Lands Council v. United States Forest Serv.*, 88 F.3d 754 (9th Cir. 1996). *Recently, however, the Ninth Circuit has revisited its holding in Inland Empire, and held that if the Forest Service utilizes a "proxy-on-proxy" approach to meeting the agency's NFMA obligations, any habitat models must be grounded in fact and field verified. Idaho Sporting Congress v. Rittenhouse, 2002 U.S. App. LEXIS 19108 (9th Cir. 2002). The court also acknowledged that other courts have expressly disavowed the holding in Inland Empire, casting additional doubt on the validity of that case. See generally*, *Sierra Club v. Martin*, 168 F.3d 1 (11th Cir. 1999), *Utah Environmental Congress v. Zieroth*, 190 F. Supp. 2d 1265, 1272 (D. Utah 2002) *(holding that § 219.19 unambiguously requires collection of population data), Forest Guardians v. U.S. Forest Service*, 180 F. Supp. 2d 1273 (D.N.M. 2001) (same).**

***Given this developing reinterpretation of the legal requirements attendant to management indicator species, it is clear that the multiple mandates in NFMA and its implementing regulations requiring population monitoring and surveying are not being even minimally met for this proposed ORV system project. A new EIS must be conducted for this project that complies with these requirements.***

Response: This EIS is consistent with direction in the Deschutes National Forest Land and Resource Management Plan (DLRMP) and NFMA requirements for Management Indicator Species. Specifically, the IDT disclosed possible effects to each individual MIS species by assessing potential habitat effects, studying pertinent literature, and monitoring data to draw correlations between those habitat effects and species population changes. Then, professional judgment was applied to all of the information to reach conclusions regarding MIS viability at the Forest level (FEIS, Management Indicator Species, starting on page 212).

The FEIS for the Deschutes Land and Resource Management Plan (page 3-14) emphasizes that MIS species were primarily selected to be indicative of "forest management activities" (i.e. timber sales and similar vegetation management work). Note that there is very little vegetation cutting or removal associated with this project (FEIS, starting on page 33, associated actions for each action alternative). This demonstrates that the Three Trails OHV project does not contribute to an overall downward trend of species viability at the Forest level, and in fact, likely will lead to long-term improvements. The effects analysis in the FEIS (starting on page 216) concluded for each individual species there are two situations regarding viability at the forest level. For species such as the woodpecker guild, the project would not contribute to a change. For species such as diurnal raptors, the project would result in a positive contribution. For all MIS within the project area, there would be a net improvement to habitat due to road closures, rehabilitation of user-created trails, elimination of cross-country travel, and directing motorized use to the places most suitable. Actions proposed in this EIS are not projected to affect the habitat conditions that the Deschutes LRMP MIS species were established to monitor. First, the methods and assumptions were applied (starting on page 156 of the FEIS). Then starting on page 212 of the FEIS, a science-based definition of quality and quantity of habitat for each individual MIS species are presented, followed by a conclusion. Resource Protection Measures listed on page 25 of the FEIS would locate new trail construction to overlay existing snowmobile trails, existing user-created trails, and/or areas where vegetation and soil may be previously disturbed. Large trees would be avoided and removal of any size would be considered an occasional event. Where trees are required to be removed, the average diameter would be 6-8 inches. Snag removal would be limited to danger/hazard trees along the trail and in staging areas. Trail maintenance is also expected to annually remove five to ten snags that may be leaning over the trail system and cause a safety hazard to riders. This level of snag removal on a 93,016-acre project is so small it cannot be quantified (FEIS, page 187). Also, Resource Protection Measures retain habitat elements by maintaining downed wood. All cleared logs to create the trail tread would remain onsite and positioned to discourage OHV users from straying

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| | off the designated trail. Further, all rehabilitation would include revegetation with native species following disturbance. The analysis for the range of Management Indicator Species discussed in the FEIS determined an upward trend in habitat and effects were related to disturbance, and not vegetative condition. This disturbance is limited because cross-country travel would be prohibited within the project area and the upcoming Travel Management Rule implementation would expand this prohibition beyond the project area. The net effect is a decrease in disturbance due to the reduction in open roads and trails (Tables 62 through 65, FEIS). The effects of motorized route created miles are more than offset with closure of currently open Maintenance Level 2 roads and rehabilitation of user-created trails. Total open road density on National Forest System Roads drops from 3.8 to 2.0 miles per square mile averaged over 16 subwatersheds (FEIS, Table 82). User-created motorized access that is on the banks of the Little Deschutes River will be moved and rehabilitated. |
| **25-67** | ***It is well documented that motorized noise has adverse impacts on wildlife including several Management Indicator Species and regional species of concern that are or may be present in the analysis area. However, the Forest Service lacks monitoring data which would tell them whether the long-term cumulative effects of the proposed ORV trail systems combined with all other past, present, and future management activities might push a number of species of concern including some indicator species toward population viability thresholds.***<br><br>Response: See response 25-66. The Forest Service followed the Deschutes National Forest Land and Resource Management Plan for requirements for Management Indicator Species (FEIS, page 212). Where there are cumulative effects, they are disclosed. |
| **25-68** | ***The Forest Service has a choice to either monitor actual populations of Management Indicator Species, or they must develop and rigorously validate habitat models that allow the Forest Service to use habitat as a proxy for populations of these species.***<br><br>***…If the Forest Service is not monitoring MIS populations directly, the EIS must explain in detail the model the Forest Service is using to correlate populations and habitat. However, the Three Trails EIS fails to provide such fundamental disclosures, relying on unfounded suppositions and omissions instead of verifiable information.***<br><br>Response: See response 25-66. Habitat parameters or life cycle requirements such as nesting, roosting, or foraging habitat was determined using the best available science for that particular species. |
| **25-69** | ***NFMA, its implementing regulations, and subsequent case law require the Forest Service to know what the viable populations of MIS located in the project area are before management activities are applied. However, the NEPA analysis and the underlying specialist reports as disclosed in the EIS never explain what the population levels are for the MIS. This is despite the fact MIS habitat will be negatively affected by the extensive trail systems proposed.***<br><br>Response: See response 25-66. |
| **25-70** | ***There is not sufficient analysis in the EIS of the effects of the proposed extensive OHV trail systems on American Marten or Pacific Fisher in the planning area. The forests of the Deschutes including the Three Trails Project area have historically provided habitat for both marten and fisher. It is likely that at least some of the project areas still provide habitat for one of both of these species—including denning and foraging habitat, as well as dispersal and travel corridors….***<br><br>***The agency has an obligation under NEPA to accurately assess and disclose the direct, indirect, and cumulative impacts to all species that will be affected by the proposed action. 40 C.F.R. §§ 1502.16. The Forest Service also has an obligation to obtain missing information or state why it could not be*** |

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| | ***obtained if that information is necessary to make an informed decision. Id. § 1502.22. Finally, the agency has a duty to prepare a new EIS (or issue a Supplemental EIS) when there are unknown risks to the environment—and its current NEPA analysis is deficient in addressing these issues. Id. § 1508.27.***<br><br>Response: A robust discussion of the American marten begins on page 213 of the Management Indicator Species in the DEIS.<br><br>Carnivore surveys were conducted on the Crescent District in 1993-1996 and 1998 using bait with camera sets, snow tracking, and track plates. There were no detections of fishers or wolverine from these surveys although marten were confirmed (DEIS page 181). The effects for fishers are discussed in the Threatened, Endangered and Sensitive Species starting on page 160 of the DEIS. Alternatives B, C, D, and E would result in a determination of **"Beneficial Impact"** for the Pacific fisher and their habitat. Claar et al. (1999) provided some discussion on recreational impacts, conclusions, and guidelines/recommendations for fisher. They include:<br>• Recreation should be directed to designated travel routes.<br>• Drainage bottoms with riparian coniferous forests/mesic forest types appear to be preferred habitat for fisher and management strategies designed to maximize the benefits of these habitats would be desirable.<br>• Roads and trails are directly correlated with trapper access to forest carnivore populations and therefore, vulnerability to trapping mortality. Impacts of increased trapping mortality as a result of recreational development/use should be considered.<br><br>The determination was based on the Claar recommendations as reviewed in context with the Three Trails OHV Project and projected decrease in overall motorized route densities and a corresponding increase in disturbance free fisher habitat in the project area. |
| **25-71** | ***In this case, the Forest Service failed to accurately and adequately assess how the proposed OHV trail systems and cumulative road and project disturbance impacts, including those near and/or into unroaded and old growth areas will impact marten. The Umatilla NF clearly is not meeting the requirements of NEPA and NFMA as they apply to pine marten, and is precluded from implementing the proposed OHV system project as a result.***<br><br>Response: It is unclear if the commenter has the same concerns on the Deschutes National Forest. If so, see response 25-70. |
| **25-72** | ***Wolverine are known to have a 150 square mile or more winter range, and are also known to utilize roadless and unroaded/potential wilderness areas—including the areas surrounding - and connective to - these preferred places. It is also well known that human disturbance and management actions related to the proposed OHV trail systems may alter the movement patterns of wolverine and other wildlife species. The EIS Failure to adequately and accurately address the likely direct and cumulative impacts to wolverine by the proposed widespread OHV systems, given the large home ranges of these animals (approximately a 150 square mile winter range), and the likelihood of wolverines in the planning area, violates both NEPA and NFMA. The failure to properly assess impacts to wolverine employing decibel noise thresholds and disturbance information pertinent to this and other wildlife species (instead of misusing human decibel thresholds) violates the requirements of the NEPA concerning analysis professional accuracy and scientific integrity.***<br><br>Response: The effects for wolverines are discussed in the Threatened, Endangered, and Sensitive |

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| | Species starting on page 200 of the DEIS. Carnivore surveys were conducted on the Crescent District in 1993-1996 and 1998 using bait with camera sets, snow tracking, and track plates. There were no detections of fishers or wolverine from these surveys although marten were confirmed. District records list unconfirmed wolverine sightings near Willamette Pass, Maklaks Mountain, and near Crescent Creek. Potentially suitable natal denning habitat may be found in the Mt. Thielsen and Diamond Peak Wilderness areas, and Cowhorn Mountain within the Oregon Cascades Recreation Area (OCRA)(DEIS page 202). The selection of any Alternative (B, C, D, or E) is expected to have **"No Impact"** on the California wolverine. A Project Design Feature in Table 2 (DEIS page 54) would buffer a wolverine den if found. |
| **25-73** | ***Wolverine are already listed in Oregon by the Oregon Department of Fish and Wildlife, however the USFS fails to adequately address this within the EIS or disclose any consultation and interagency planning with ODF&W regarding potential OHV impacts, agency concerns, and the long term recovery and protection of wolverine and their habitat. These failures are in violation of the requirements of the NEPA, and in contravention to the necessary cooperative interagency efforts needed to begin the recovery of this species and its required habitat.***<br><br>Response: The Forest Service has met their obligation for consultation under the Endangered Species Act (page 27, DEIS) and has received concurrence. Several discussions have occurred with ODFW and their comments on the DEIS has been included in Appendix D. A response to those concerns is included in these responses. See also response to 25-72. |
| **25-74** | ***The EIS fails to adequately address the proposed OHV trail systems and associated management actions potential detrimental impacts on wolves that may utilize the planning area, if not now then highly likely within the foreseeable future as wolf recovery continues throughout the state, whether for territorial or transitory habitat.***<br><br>Response: See response to 25-38. There are no established packs or reproducing pairs of wolves on the Deschutes National Forest. |
| **25-75** | ***The EIS failed to provide an adequate analysis of how the OHV system will impact hares, rabbits, squirrels, avian species, as well as other wildlife species that may at times be essential prey for lynx. Without sufficient assessment of how these prey species will be impacted, it is impossible to quantify and qualify the impacts to lynx from the implementation of this proposed OHV trail system(s). The EIS must analyze the cumulative impacts of its proposed OHV systems on lynx prey in association with other regional impacts across the surrounding lands.***<br><br>Response: The Deschutes National Forest and specifically the Three Trails OHV Project Area does not have the habitat for lynx based on current habitat definitions. |
| **25-76** | ***The EIS makes little mention as to any site-specific to protocol recent surveys of the planning area regarding lynx, lynx dispersal routes and connective corridors to suitable habitat, or assessing the abundance, viability, and distribution of potential lynx prey. These planning analysis deficiencies must be corrected in a revised NEPA planning process.***<br><br>Response: See response to 25-75. |

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| **25-77** | ***The decision to designate such a large area of the Crescent District for OHV use and disturbance is likely to adversely impact native ungulate species, including elk and deer in the affected lands. The EIS fails to adequately address native ungulate populations, including historical variability and current population levels and trends. Current and future desired refugia, disturbance levels, habitat quality, fawn and calf survival, forage conditions and overall management objectives for native ungulate species are not adequately disclosed and addressed. Habitat needs, including cover, forage, fawning and/or calving areas, the ratios of bulls/bucks to cows/does, survival rates and fluctuations of young, and overall cumulative impacts to these species are not sufficiently assessed. Potential adverse changes and impacts to native ungulate populations, habitat, and forage conditions from OHV intrusions into preferred habitat areas are not assessed.***<br><br>Response: Although the project area encompasses approximately 93,016 acres, the actual trail system occupies a small fraction of the Crescent Ranger District and much of that utilizes existing shared use roads. Big game is covered extensively in the Big Game section of the DEIS starting on page 262 of the DEIS. The big game requirements of the Deschutes Land and Resource Management Plan are listed on page 156 of the DEIS. There is a Forest Plan Amendment to adjust the boundaries of the Hemlock Key Elk area to reduce existing road densities from 3.43 to a range of 0.70-0.81mi/mi$^2$ to follow WL-46 in the Deschutes Land and Resource Management Plan. It would also provide more favorable habitat in the form of stringer meadows, more solitude and less road densities that are important for calving and forage-WL-45 (DEIS page 439 Other Disclosures). The total acreage of the Hemlock Key Elk area stays the same at 2,511 acres. |
| **25-78** | ***The analysis fails to assess the cumulative impacts of OHV trail systems and use in combination with the fluctuating and foreseeable future presence of native predators in the greater region, particularly regarding returning wolves. How OHV systems may impact native ungulates in combination with increased displacement and predation as wolf and wolverine recovery objectives are met over time has not been sufficiently disclosed or assessed in the NEPA analysis. Nor does the EIS address how disruption of ungulate movement patterns may affect predator movements of cougars, including possible increased human cougar conflicts. Without such assessments, the agency lacks sufficient direct and cumulative impacts understanding upon which to base their proposed OHV system designations for these lands.***<br><br>Response: See response to 25-75. Also see response to 25-39 related to generalists' species such as cougars. Response 25-77 discusses effects to ungulates. |
| **25-79** | ***The EIS violates the NEPA by the lack of meaningful and accurate analysis and requisite meaningful scientific disclosures and conclusions assessing potential adverse impacts to eagles, hawks, owls, various other raptors and their nesting and foraging territories, and the varied territories and populations of prey species from the proposed OHV trail systems.***<br><br>Response: The commenter has not been specific enough to identify what is not meaningful or accurate regarding these species. Eagles, hawks, owls, and other raptors are addressed in depth in the Wildlife-Threatened, Endangered, and Sensitive Species and Management Indicator Species sections in Chapter 3 of the DEIS. |
| **25-80** | ***Concerning*** *'Provision of Recreational Opportunity: …The analysis also discloses the balance of motorized and non-motorized recreational opportunities, including the potential affect of noise on quiet recreation… Designation of a motorized trail system benefits the non-motorized user as it effectively* |

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| | *separates uses"* ***(449). This claim is presumptuously fatuous and inflated. The EIS herein fails to disclose, address, and develop alternatives representative of the significantly greater benefits that would result to quiet recreation qualities from restricting OHV use to considerably smaller extents, in already degraded locations far from ecologically and recreationally significant areas.***<br><br>Response: See responses to 25-22, 25-24, and 25-25. |
| **25-81** | ***Neo-tropical migrant and native rangeland, riparian, and forest-dependent birds (as well as numerous other wildlands species) are in serious decades-long population declines due to the adverse cumulative impacts from over a century of public lands management, including growing adverse impacts from OHVs as well as impacts from livestock grazing, habitat disturbance and loss, and logging in Oregon (see "Avian Population Trends" by Brian Sharp). The EIS fails to fully and adequately disclose the current population status and trends of native grassland and native forest dependent Neotropical migrant and native avian species within the planning area and adjacent lands. Compliance with both the NFMA and the Migratory Bird Treaty Act requires that all alternatives presented within the EIS must be capable of protecting essential nesting and foraging habitat for these many avian species, and of reversing any current downward population trends. Such a course of proactive protective action is also required by the ESA and the NEPA, Presidential and federal agency directives, and the Migratory Bird Treaty Act, and recommended as well by credible conservation science. However, in violation of these legal requirements and scientific recommendations, the EIS presents widespread OHV trail system plans that would likely result in the irreparable degradation and disturbance of available habitat, increase stress and vulnerability levels, and further imperil neotropical and native avian species populations, resulting in both individual mortality to these species as well as irreparable habitat and population level harms.***<br><br>Response: We were unable to locate the 1996 publication "*Avian Population Trends*" by Brian Sharp cited by the commenters. However, the Three Trails OHV DEIS provides a full disclosure of effects to neo-tropical migrants and native rangeland, riparian, and forest-dependent birds using several publications and websites more recent than the Sharp publication. Included in the effects analysis are current rankings and population trends as listed by NatureServe for the state of Oregon and the rationale for the listing if available and citations from the Marshall et al. 2003 book "*Birds of Oregon*". The results of project area avian surveys have also been included as well as the amount and distribution of suitable nesting habitat in the project area. The effects of the project on various species have been disclosed in the Management Indicator Species section, Birds of Conservation Concern section, and Threatened, Endangered, and Sensitive Species section of the DEIS. Project Design Features and Mitigation Measures have been incorporated consistent with habitat recommendations found in the Landbird Strategic Plan prepared by the Forest Service in 2000 to maintain, restore, and protect habitat necessary to sustain healthy migratory and resident bird populations to achieve biological objectives. On a more-local level, "*A Conservation Strategy for Landbirds of the East-Slope of the Cascade Mountains in Oregon and Washington*" was authored by Altman (2000) and is also cited in the analysis. This strategy has been used since its development in planning and projects analysis on the Crescent Ranger District. The commenter did not point out how the Brian Sharp reference differs from the Forest Service findings and cited science. |
| **25-82** | ***The EIS's proposed OHV trail systems and their management provisions could significantly impact migratory birds in violation of the Migratory Bird Treaty Act, 16 U.S.C. §§ 703—712 (1994). It is well known amongst the conservation-science community that many migratory birds which are currently experiencing severe population decline trends are "strongly associated" with public forests and*** |

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| | ***wildlands ecosystems, riparian systems, and old and mature interior forest habitat. The proposed OHV trail systems could result in both directly and indirectly killing nesting and fledgling migratory birds, and disturb and impair otherwise viable habitat. Migratory and native bird species habitat has already been significantly diminished due to the cumulative impacts of past management throughout much of the planning area.***<br><br>Response: See Response to 25-81. |
| **25-83** | ***The proposed management provisions could irreparably fragment and degrade migratory bird habitat. Impacted areas could be negatively impacted by generalist bird species favored by the environmental conditions created in overly disturbed fragmented ecosystems. Other avian and predator species more adapted to management disturbance, including non-native invasive avian species, would likely move into the greater planning area, further displacing and adversely impacting imperiled neotropical and migrant avian species of concern. The impacts these abundant and highly competitive invasive bird species would have on sensitive migratory and native avian species dependent on less disturbed and fragmented natural ecosystems should have been adequately disclosed and assessed in this planning EIS. The adverse impacts that the proposed OHV trail system could have on migratory birds are well-documented by multiple scientific studies.***<br><br>Response: See response to 25-81. |
| **25-84** | ***Current plans call for OHV trails and road use within and adjacent to the LSR on Royce Mountain, as part of the Junction trail system. Junction also includes adjoining and overlapping hiking, equestrian, and OHV trails (where the agency's infeasibility of enforcement could only result in OHV trespass on natural recreation trails). OHV use is incompatible and antithetical with natural recreation, degrading the serenity and quiet beauty of nature with OHV generated noise, dust plumes, soil and vegetation degradation, exhaust fumes, and vanished or diminished opportunities to view wildlife. The EIS must be revised to remove all proposed OHV trails anywhere within or near LSR boundaries, old growth locations, watersystems and riparian locations, wildland meadows, and ecologically significant areas (roadless, OCRA, wilderness, etc.). There should be no shared or adjoining use of natural recreational trails and campgrounds with OHVs. There should be no OHV trails within or near riparian areas. Generally OHV trails should be at a minimum one or more miles from all of these locations. OHV trails should be limited to already management impacted locations where OHV disturbance would not inflict adverse environmental harms upon wildlife, watersystems, ecological integrity, soil communities, hydrology, and the natural resource quality of the affected area.***<br><br>Response: Effects of the alternatives to the Davis Late-Successional Reserve for spotted owls starts on page 165 of the DEIS. Consistency with the Standards and Guidelines for Late-Successional Reserves found in the Forest Plan as amended was clarified in the FEIS. There is no new trail construction planned for any action alternative in the Late-Successional Reserve. See response to 25-52 and implementation of the Travel Management Rule mandating the National Forests to strike a balance for all recreation uses. |
| **25-85** | ***The project as proposed would allow OHV activities in some or all portions of 7 Management Strategy Areas (MSA) of the Davis LSRA. The proposal to allow OHV impacts and disturbance within spotted owl habitat and potential future occupied territories violates the NFMA and would impair the attainment of recovery objectives for this and related old forest dependent species. Similar to the impacts noted above concerning avian eagles, raptors, and owls; OHV use within ecologically critical*** |

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| | ***habitat territories would diminish prey abundance, degrade cover, disrupt natural serenity and refugia, displace nest and fledging territories, unduly increase these and other imperiled species stress and vulnerability, and jeopardize offspring survival.***<br><br>Response: See responses to 25-79 and 25-84. There would be no new roads or trails created in the Davis LSR and no loss of Nesting, Roosting, and Foraging (NRF) habitat (DEIS pages 174, 177). All action alternatives would result in less disturbed habitat as compared to the existing condition, due to road closures. |
| **25-86** | ***The EIS's claim that soils are not prone to airborne sedimentation fail to begin to accurately match the reality of widespread airborne sediment dust plumes rising from OHVs in the planning area, violating NEPA's accuracy, "hard look," and reasonableness requirements.***<br><br>Response: A Project Design Feature for monitoring effects to botanical resources from fugitive dust is on page 52 of the DEIS. Effects to Wilderness on page 116, Soil Quality page 139, Water Quality starts on page 335, Forested Vegetation on page 399, Scenery on page 411, Social-economic on page 422, and Air Quality on 433. |
| **25-87** | ***The EIS discloses that the Little Deschutes River is on the Oregon State 303(d) water quality impaired list for exceeding temperature standards. It mentions high sediment levels in some area waterways as well. However, it does not disclose if and when area waterways were last tested for sediment and cobble embeddedness levels, and if any of the area waterways may warrant 303(d) listing for sediment as well. Given the excessive numbers of bare dirt roads and user created trails throughout the area, the high levels of logging degraded forest acreage, the deeply incised trails cutting into forest and riparian soils, and the accumulated levels of displaced dusty soil it would seem highly likely that area waterways should be fully re-assessed for sediment affected water quality as per 303(d) list standards, and the results disclosed and addressed, before further consideration be given to any proposal for permissible OHV activity is considered in the planning area.***<br><br>Response: A thorough analysis of the Little Deschutes River as well as Crescent Creek and water quality can be found starting on page 326. Activities associated with route designation (including new trail construction) and staging areas will have an overall beneficial effect to the soil resource by placing the trail in more ecologically suitable locations and allowing natural and management-induced processes to lower the overall footprint of detrimental soil conditions within the project area.<br><br>The Little Deschutes River is 303(d) listed for temperature and dissolved oxygen – which is an element of temperature. Crescent Creek is also listed for temperature. It was determined that the action alternatives would not change temperature within the Little Deschutes River and a reduction of OHV use from within the riparian area would likely improve riparian vegetation cover, the percent change (less than one percent) would not likely be enough to affect shading of the Little Deschutes River which is linked to temperature and dissolved oxygen content (DEIS, page 335). For Crescent Creek, which is also listed for temperature, the OHV trail system only has one crossing, which is engineered for Best Management Practices. Alternative C uses Crescent Creek campground as a staging area. Otherwise there are no other trails or potential to affect water quality, and more specifically, temperature. The main parameter affecting temperature is due to impoundment and flows released from the dam. Water quality standards cannot be met without restoring streamflows (FEIS, page 332).<br><br>The DEIS on page 120 lists the restoration activities that will occur at the staging area and where user-created motorized access occurs along the Little Deschuets River include: |

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| | • Decompaction/subsoiling of trails<br>• Monitoring and hand pulling of invasive plant species<br>• Planting of native plant material (seeds, live plants)<br>• Installation of bollards and other structures to block motor vehicle access<br>• Interpretative signs informing users of restoration activities<br>Also, reference the Aquatic Conservation Strategy on page 347 of the DEIS. This project has been determined to be consistent with the Deschutes Land and Resource Management Plan, as amended, by the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (ROD, B-9) by meeting the nine objectives, as well as Key Watershed Standards and Guidelines found in the ROD, C-7. |
| **25-88** | ***The area currently includes limited populations of, and habitat for, both bull trout and redband trout. Despite a lengthy section addressing area watersystems and selected aquatic species, the EIS fails to demonstrate how its widespread OHV proposals would facilitate or contribute to the recovery objectives for these and other aquatic and/or riparian system dependent species. Absent the current EIS proposals, the forthcoming TMP decision would prohibit much of the current environmentally harmful OHV use throughout the area, including widespread user-created trails and cross country travel that are directly and cumulatively degrading aquatic systems and habitat. The extensive OHV systems proposed by the EIS would undercut much of the beneficial gains the coming TMP decision would provide, by authorizing widespread OHV use across much of the area, including locations near, within, and crossing waterways and riparian habitat.***<br><br>Response: A thorough discussion on bull trout, the recovery plan, and redband trout can be found beginning on page 320 of the DEIS. |
| **25-89** | ***The EIS fails to present comparative assessments of impacts to aquatic systems and riparian habitat between the OHV alternatives and a "no action" post TMP decision alternative baseline. The EIS fails to accurately disclose and address current and likely future sedimentation and erosion levels, misrepresents OHV generated sediments as 'not being prone to become airborne' without qualifying this unfounded presumption utilizing credible quantitative methodology as required by the accuracy, disclosure, and scientific integrity standards of the NEPA.***<br><br>Response: See response to 14-1 and 14-2 regarding timing of the Travel Management Rule and the Travel Management DEIS. Potential for sedimentation is discussed throughout the Soil Quality and Aquatic Resources sections. The commenter has not identified which “credible quantitative methodology as required by accuracy, disclosure and scientific integrity standards” are better or inconsistent with those methods and assumptions used for this analysis. Science cited for describing the effects of fugitive dust was Goossens, 2009 on page 399; and Ouren et al. 2007, Padgett (2006) and (Goossens and Buck 2009) on page 422 of the DEIS. |
| **25-90** | ***The EIS needs to be significantly revised. New alternatives need to be developed which restrict OHV use to limited locations distant from watercourses, riparian habitat, and ecologically important areas (as noted elsewhere herein). Roads near area waterways that contribute to degraded aquatic and riparian conditions must be identified and harmful impacts effectively remedied with proactive action (such as ecologically careful road removal and native vegetative restoration). Area waterways must be reassessed under 303(d) standards and corrective actions taken to prevent water quality degradation. Proactive interagency recovery plans must be developed for listed species and species of*** |

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| | ***concern, including aquatic species. Subsequent management proposals, including this one, must demonstrate contribution to species, aquatic system, and natural ecosystem recovery objectives. Until such time as this can be credibly accomplished and demonstrated, the current NEPA deficient EIS for this proposed excessive, unwarranted, and environmentally harmful OHV trail system must be withdrawn.***<br><br>Response: The Forest Service disagrees that the Environmental Impact Statement needs to be significantly revised. Commenters have provided no legal or scientific basis to support this claim. The Environmental Impact Statement demonstrates how it meets all laws, regulations, and policies starting on page 437 of the DEIS. |
| **Letter #26** | **Christine B. Reichgott, US EPA** |
| **26-1** | ***We are challenged…by the lack of quantitative data regarding the carrying capacity of the proposed system, and the minimum amount of trail required in order to provide a safe and rewarding motorized recreation experience. Table 19 indicates current maximum use (holiday weekends) is around 450 visitors, and that average use is 250 visitors. Alternative E would provide each rider (on average) over 2 miles of trail and Class II road. Given the proposed development of the Lava Rock, Ochoco Summit and Meadow Lake OHV areas, and the twelve OHV opportunities close to Crescent Ranger District identified in Table 18, it would be helpful to have carrying capacity information in order to ensure that the trail system is "right sized".***<br>***…We encourage the Forest to include information regarding minimum trail system requirements in the FEIS.***<br><br>Response: The Three Trails OHV project has identified the right-sized trail system for the planning area based on the use that is occurring, collaboration with the local and non-local users themselves, interviews with local business owners and OHV club members, and the criteria for a quality trail system (starting on page 87 of the DEIS). Best available science, the Oregon Statewide Comprehensive Recreation Plan, and actual growth occurring in nearby areas were also factored in. Although we cannot definitely say exactly what the perfect number of miles are for this trail system, it is based on the criteria used for evaluating the alternatives for OHV riders by class (Recreation section of DEIS), considering the key issues, management areas, and other issues (access to and from amenities, distance to destinations, scenic viewpoints, existing and projected use levels), to determine the approximate trail system mileage. It is acknowledged that this does not meet everyone's ideal desire, but strives to provide the best balance for all resources.<br><br>It is also is consistent with the Travel Management Rule CFR 212 subpart B (identification and maintenance of an appropriately sized and environmentally sustainable road system that is responsive to ecological, economic, and social concerns). The minimum trail system was designed using two criteria:<br>1) User experience dependent upon the type of riders, and<br>2) Standards the Forest Service and specifically, Central Oregon Off-Highway Vehicle Operations staff, employ for safety in trail design, provide the experience for the class of vehicle, and protect the environment (DEIS, page 52, Project Design Features for safety and Operations and Maintenance Guidelines, page 418).<br><br>Staging areas have been designed as access portals to the trail system in order to provide for safety, accommodate use that is occurring, and address projected trends. Response 14-1 addresses the |

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| | relationship amoung other riding opportunities in central Oregon. The Three Trails OHV project would be considered a destination OHV area (as well as others) and it is highly unlikely an appreciable number of visitors would venture from one destination to another for a day excursion. This is based on local knowledge and monitoring that is occurring at other riding areas such as the motorized trail systems at East Fort Rock, Edison, Millican Valley, and Henderson Flat.<br><br>As the Forest Service implements the decision, although it would be for an entire trail system, it would be a phased-in implemention dependent upon funding (which includes volunteers and grants) and available resources. During the course of implementation the right-size would be further informed by design, challenge and use, and monitoring. |
| **26-2** | ***We also note…that although the system proposed under Alternative E is an improvement over current condition in terms of road density, 50% of the subwatersheds within the planning area would continue to exceed Forest Plan standards for road density.***<br>***…We also encourage the Forest to consider a phased approach to trail construction, based upon use trends and thresholds (i.e. do not engage in trail construction unless user data indicate that safety thresholds are likely to be exceeded.)***<br><br>Response: See Response to Comment 14-11. The Three Trails OHV project has identified the minimum road system on the 93,016 acres that encompasses theThree Trails OHV project area, which is about one third of the Ranger District. If the target road density within Forest Service jurisdiction is over the target of 2.5 miles per square mile, there can be several reasons. Roads that provide access to private lands, County, and State roads (Highways 58 and 97, County Road 61) can make up a significant portion of road densities, depending upon how much they overlap into a particular watershed. Many roads are usually not available for closure, as well as other roads that provide access for recreation, suppression, and other resource management.<br><br>In Alternative E which was identified as the Preferred Alternative, total open road density on Forest Service managed roads drops from 3.8 to 2.0 miles per square mile averaged over 16 subwatersheds. The target open road in the Forest Plan for big game is 2.5 miles per square mile (WL-53). It should be noted that this Standard and Guideline only uses roads for determination of consistency; not trails. When motorized trails are included in this average, the total is 2.5 miles per square mile. Response 14-11 explains the 2.5 road density figure is a target number and was developed in consideration of other uses in the forest in addition to big game. Exceeding target road densities can be a factor of many resource-related reasons, including providing access to private lands and recreation developments/destinations, County and State roads (Highways 58 and 97, County Road 61), access for fire suppression, and many other resource management considerations.<br><br>In addition to the monitoring that would occur with the alternative selected (DEIS, page 58 and Response 14-12), a phased approach to trail implementation would be employed (Comment 26-1). |
| **26-3** | ***We recommend that the FEIS clarify whether big game populations within the Crescent Ranger District utilize the areas that would be managed under the proposed Lava Rock, Ochoco Summit, and Meadow Lake OHV plans; the extent to which wildlife populations are affected by current management; and the extent to which those populations would be affected (cumulatively) by the implementation of the OHV projects in each of these areas.***<br><br>Response: Preliminary data on radio collared mule deer indicate summering mule deer in the Three |

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| | Trails OHV area primarily migrate easterly across Highway 97, detouring north or south around Walker Rim to winter ranges in the desert beyond the district and Deschutes National Forest boundary (ODFW 2009). This preliminary data also shows they do not go through the Lava Rock area or any area farther north on the Deschutes National Forest (page 263, DEIS). The extent to which wildlife populations are affected by current management is disclosed in the affected environment/existing condition assessments and a cumulative effects analysis has been preformed in the content and intensity necessary where there is an effect. Reasonably foreseeable actions are defined as, "Those Federal or non-Federal activities not yet undertaken, for which there are existing decisions, funding, or identified proposals. Identified proposals for Forest Service actions are described in §220.4(a)(1)." As such, they were considered in the appropriate areas and have limited affect to much of the resources described in the Three Trails OHV Project area (Response 14-1). |
| **26-4** | ***We recommend that the FEIS discuss how the four OHV projects within the Deschutes National Forest (along with Cline Buttes if applicable) will interface with regard to monitoring and enforcement, and the extent to which these projects would rely on the same pool of resources (volunteers, enforcement officers, etc.). If this analysis indicates that the existing resource base is not adequate to staff, monitor, and maintain multiple riding areas, the FEIS should also discuss options to fill that resource gap.***<br><br>Response: A decision on the Three Trails OHV Project area is not unlike decisions on other recreation-related decisions; the central Oregon Forests and BLM leadership provides input into annual priorities dependent upon budget and available resources (for example securing grants from partner, equipment, staff, including volunteers). The important factor is that the Central Oregon Combined Off-Highway Vehicle Operations infrastructure is in place and working and other riding areas would be limited to the same available resources. |
| **26-5** | ***We note some inconsistency between tables and other portions of the document. For example, Table 1 indicates that the proposed action (Alternative B) would allow for up to 130 miles of trail, whereas Table 3 indicates that Alternative B would provide for 143 miles. There are similar discrepancies for Alternatives D and E. Similarly, page 101 of the document indicates that Alternative E would provide for 134 whereas Tables 1, 3, and 4 indicate that Alternative E would provide for 140 miles of trail. In order to allay confusion over the number of miles of trail under each alternative, we recommend that these tables be reconciled.***<br><br>Response: The Final EIS has reconciled these numbers on pages 103 and Tables 1,3, and 4. |

**Assessment of Additional Scientific Literature Submitted to the Forest Service**

The consortium of conservation group consisting of the Bend Back Country Alliance, Cascadia Wildlands, Gaia Ki, Juniper Group Sierra Club, LOWD-BMBP, LOWD- Cascadia's Ecosystem Advocates, Oregon Wild, Wildlands CPR, and Winter Wildlands Alliance, submitted four attachments and a CD to their comment letter. The CD included a large file of photos (79) and a document describing the various resource damage shown. There were no references listed on the CD, however there are documents (scientific research and surveys and findings) referenced in the comments and attachments by author and year only and not referenced fully to substantiate any particular statement or discrete issue. The Interdisciplinary Team evaluated each document for applicability to the project area. The results of that evaluation are displayed in the following table.

Key findings about the review of the attachments:
• Many of the contributed documents do not report original and empirical research that has been subjected to an impartial review through the peer review or refereeing process; instead they are opinion pieces from newspapers, court documents, documents of unknown origin, presentations by individuals or organizations, etc.
• Some of the contributed documents are not applicable to the Three Trails OHV project because they report on studies conducted in different forest types or regions such as arid environments (sand dunes), where many ecological processes are known to differ from those of central Oregon ponderosa pine and lodgepole forests.
• Some of the contributed documents point to areas of uncertainty and conflicting results in law enforcement for other states with OHV designated trail systems.
• The science that was relevant to the Three Trails OHV project provides no clear evidence that the conclusions in the FEIS are incorrect or scientifically controversial.

The following table summarizes the Forest Service consideration of publications that were provided during the comment period and which were directly referenced in the comments, or determined to either have some relevance to the analysis or indicate there is a difference of opinion within the body of the science. NEPA states that comments on the EIS shall be as specific as possible (40 CFR 1503.3 Specificity of Comments). Some of the following documents are considered non-substantive comments that do not warrant further response. In either case, the following table explains the consideration given by the Forest Service.

| Referenced document | Forest Service Consideration/Response |
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| *Burns, 2009,* 2008 Central Oregon Off-Highway Vehicle Use Study: A Survey of Characteristics, Behaviors and Perceptions. *Final Report Submitted to Deschutes National Forest, USDA Forest Service (Region 6), Bend, OR.* | The focus of this investigation was an evaluation of visitor perceptions of current conditions at OHV areas due to growing visitation and congestion at certain sites within the Deschutes–Ochoco NF. This report focused on highlights of basic findings from on-site interviews that were conducted over the 2007-2008 OHV recreation season. In conclusion, results suggest that visitors generally were very satisfied with their overall experience, felt that is was not crowded, the number of people they saw was about what they expected or less, and went there because it was a good place to do the activities they enjoy. This conclusion has limited application to the Three Trails OHV Project Area for a couple reasons. Responses would likely be different at Crescent Lake Junction or Two Rivers North, where there are no nearby designated trail systems. Also, the clientele interviewed for the study is likely a different subset of visitors than are found at the Crescent Ranger District, where public meetings in Eugene and Klamath Falls has indicated a strong visitation from those communities. |
| Gregory, Jack, March 13, 2008, Special Agent in Charge (Ret.), USFS Southern Region, Testimony Before Subcommittee on National Parks, Forests, and Public Lands, U.S. House of Representatives | The testimony from Jack Gregory was reviewed. Enforcement is an important aspect of obtaining compliance with any subset of users of the National Forest System lands. However, having an available and adequate recreation experience is also an important component of enforcement, in addition to education and monitoring. By providing a trail system that fulfills their expectations, it encourages compliance. This would be no different than for local woodcutters that need fuel wood, or providing non-motorized experiences such as mountain bike trails. Also, Mr. Gregory's experience is limited to the USFS Southern Region and the Central Oregon Combined Vehicle Operations team has had a successful enforcement model in central Oregon. |
| Forest Service article entitled Position Paper: Unmanaged Motorized Recreation | The commenter utilized two quotes concerning noise and disturbance to wildlife and meeting outdoor recreational demands while sustaining natural resources.<br><br>This position paper does not provide any science that opposes that used in the Three Trails OHV project. Throughout the Wildlife section of Chapter 3, in the Three Trails OHV FEIS, there is detail about the effect of noise on communication (i.e. masking causing communication problems between same species and different species), altered behaviors, hearing loss and decrease sound sensitivity, increase in stress hormones, species abundance along road sides, nesting abundance along trails/roadways, and possible increase in predation. The Wildlife (page 151 of FEIS) and Big Game sections (page 266 of FEIS) have robust discussions on disturbance to deer and elk. |

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| Off-Highway Vehicle Recreation in the United States and its Regions and States: An Update National Report from the National Survey on Recreation and the Environment (NSRE) 2008 PNW 4-wheel Drive and Deschutes County 4-Wheelers Trails Development Committee comment: "*There was a consistent upward trend in number of OHV participants across four viewing periods between 1999-2003. The estimated number of OHV participants increased 37 percent during this time, from 37.6 to 51.6 million people.*" | This is an Outdoor Recreation Statistics (RECSTATS) Research Report in the Internet Research Information Series (IRIS) and does not provide any science that counters that used in the Three Trails OHV project.<br><br>The commenter quoted just part of the paragraph about upwards trends of growth, the next sentence in the paragraph states; "A slight decrease was beginning to show in late 2003, however, a trend which continued thru 2007. This estimated decrease in total number of participating went from a high of 56.1 million in 2002-2003, to just over 44.4 million in 2005-2007." |
| Charles F. Wilkinson and H. Michael Anderson *Land and Resource Planning in National Forests, 304 (1987). "Monitoring is "essential to verify, and if necessary, modify the forest plan's assumptions about the effects of…management activities on wildlife…in order to meet the monitoring requirements, planners will need to obtain adequate inventory of wildlife populations and distribution."* | The Forest Service was unable to obtain this publication. See Response 25-66 in Response to Comments. |
| Holthausen, Richard; Czaplewski, Raymond L.; DeLorenzo, Don; Hayward, Greg; Kessler, Winifred B.; Manley, Pat; McKelvey, Kevin S.; Powell, Douglas S.; Ruggiero, Leonard F.; Schwartz, Michael K.; Van Horne, Bea; Vojta, Christina D. 2005. Strategies for monitoring terrestrial animals and habitats. Gen. Tech. Rep. RMRS-GTR-161. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 34 p.<br>http://www.fs.fed.us/rm/pubs/rmrs_gtr161.pdf<br><br>This reference is included under the commenters (Cascadia Wildlands) heading of Management Indicator Species but not specifically cited. | This General Technical Report contains recommendations for monitoring terrestrial animals and their habitats and how they compare with Forest Plans, and what types of monitoring may be needed. The Three Trails OHV project, Wildlife (FEIS starting on page 150) and Management Indicator Species (FEIS starting on page 212) are consistent with Deschutes Land and Resource Management Plan and the most current regional direction for habitat modeling and surveys.<br><br>The commenters provide no opposing science to that used in the Three Trails OHV project. See Response 25-66 in Response to Comments. |
| Monaghan and Associates, a marketing research firm, conducted a 2001 study at the behest of the Colorado Coalition for Responsible OHV Riding, a coalition of off-road vehicle representatives, environmentalists and public officials. *For the report, see* | Not peer reviewed science. This is a paper dated November 15, 2001 by LisaMarie Frueh undertaken by Monaghan and Associates to conduct original opinion and behavioral research and examine existing data regarding OHV use in Colorado.<br><br>See response to Lewis, M.S. and R. Paige citation |

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| *http://www.wildlandscpr.org/status-and-summary-report-ohv-responsible-riding-campaign* | |
| Fisher, Andrea L., Dale J. Blahna, and Rosalind Bahr, 2001; Off Highway Vehicle Uses and Owner Preferences in Utah. Logan, Utah. Utah State University, at iv, *see* http://extension.usu.edu/iort/files/uploads/pdfs/revisedOHVreport.pdf | Not peer reviewed science. This paper is a random sample telephone survey of less than two percent of the registered OHV owners in Utah (943 out of 50,676). It asked about riding preference, utilizing helmets, where they ride, how far they traveled, and fees paid to the state. Less than half were familiar with Utah's OHV program "Know before you go." Most preferred to ride their OHV on public lands.<br><br>See response to Lewis, M.S. and R. Paige citation |
| Lewis, M.S., and R. Paige. 2006: Selected Results From a 2006 Survey of Registered Off-Highway Vehicle (OHV) Owners in Montana. Responsive Management Unit Research Summary No. 21. Prepared for Montana Fish, Wildlife and Parks, *see* http://fwp.mt.gov/content/getItem.aspx?id=19238<br><br>The commenters cite this and the above two studies (set in Colorado, Utah, and Montana) as peer-reviewed and commented: "Accordingly, the record is clear that the problem of OHV-related abuse is not located someplace else, it is a problem in the Deschutes National Forest." | This is not peer reviewed science. The commenter suggests that the Deschutes National Forest has a problem of OHV-related abuse however, the studies cited were not in Oregon. The Forest Service has reviewed the research reports related to efficacy of law enforcement in various locations around the country such as Utah, Colorado and Montana and agrees there are challenges to managing OHV use.<br><br>Page 413 of the DEIS has a detailed Education, Enforcement, Safety, and Operational Maintenance Plan. Since 1988, a successful model used by the Central Oregon Combined Off-Highway Vehicle Operations (COHVOPS). Page 58 details a monitoring plan. Monitoring has shown a high level of compliance on designated trail systems in central Oregon managed by COHVOPS (98% over the past 18 months).<br><br>The above three listed research papers on OHV use in Colorado, Utah and Montana (as cited by the commenters) were not used in the FEIS. These three regions have different riding terrain, forest types, enforcement programs, and none had a program like Central Oregon Off-Highway Vehicle Operations (COHVOPS) model which has been successful in central Oregon. It incorporates agency personnel and volunteers into an integrated education and enforcement program that monitors elements such as sound testing at staging areas and key locations, and rules related to camping and use of the trail system. For more information, reference the Education, Enforcement, Safety, and Operational Maintenance Plan section in Chapter 3. None mentioned having mandatory safety training like the one being phased-in here in Oregon for Class I and III riders (ATV Safety Education Card by 2014). |
| Nevada Fish and Wildlife Office, U.S. Fish and Wildlife Service. 2007. 12-Month Finding on a Petition to List the Sand Mountain Blue Butterfly (*Euphilotes pallescens ssp. arenamontana*) as Threatened or Endangered with Critical Habitat. Federal Register, Vol. 72, No. 84. *See* pages 24260-61. | This notice of 12-month petition finding on status of the Sand Mountain Blue Butterfly discusses unrestricted OHV use in an arid environment that has led to the gradual process of destruction and modification of the sand dune habitat and associated Kearney buckwheat required by the Sand Mountain Blue butterfly. It "determined that the implementation and effectiveness of a mandatory, enforceable route system that restricts travel within the dune habitat addresses this potential threat by eliminating or greatly reducing further habitat deterioration and allowing for |

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| | habitat recovery within closed areas." This is different from the Three Trails OHV project in type of terrain, but the premise remains the same to locate trails in sustainable and sustainable locations. This was the Purpose and Need for the Three Trails OHV project. |
| Chavez, D.J. and J.F. Tynon. 2007. Forest Service Law Enforcement Officer Report: Nationwide Study. Research paper PSW-RP-252. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 284 p. | This paper is a research paper on (LEOs) for all 10 regions for Forest Service. It goes in depth by Region concerning what criminal activity most concerned the LEOs, what is on the increase, decrease, if they'd been threatened on the job and what were their priority issues facing the Law Enforcement profession in the Forest Service.<br><br>The referenced document does not oppose concepts used in the Three Trails OHV project. Page 419 of the FEIS has a detailed Education, Enforcement, Safety, and Operational Maintenance Plan. Since 1988, a successful model used by the Central Oregon Combined Off-Highway Vehicle Operations (COHVOPS). Page 58 details a monitoring plan. |
| Ruggiero, 1999b; Aubry ,1999<br><br>Commenters (Cascadia Wildlands) cite these two authors within their comment, but with an incomplete citation. It is in regards to: "Next, it is clear that data is lacking in the food habitats of lynx in Oregon's forests, and during dispersal and migration through non-forested areas, which represent a critical research need." | The Lynx Conservation Assessment and Strategy (Reudiger et al. 2000) identified the need for 10 square miles of primary vegetation to support lynx survival and reproduction and constitute a lynx analysis unit. On the Deschutes National Forest these plant associations are limited and only comprise 3,650 acres of which 3,500 acres do not support snowshoe hare populations. Consequently, there is an inadequate amount of primary habitat to support lynx on the Deschutes National Forest.<br><br>Further, on November 8, 2006 the USFWS issued a news release announcing that critical habitat for the Canada lynx has been designated and includes approximately 1,841 square miles within the states of Minnesota, Montana, and Washington. There is no critical habitat designated in Oregon. The final rule for designation of critical habitat in the Federal Register Notice (Vol. 71, No. 217, November 9, 2006) concluded that not all occupied habitat is essential to the conservation of the lynx.<br><br>At the present time there is no information to suggest lynx are present on the Deschutes National Forest. If, in the future lynx are confirmed on the Deschutes National Forest they will receive full protection under the Endangered Species Act and consultation with the U.S. Fish and Wildlife Service will commence immediately if necessary. Also, if new information becomes available on vegetation that constitutes lynx habitat, analysis will occur to identify any lynx habitat on the Deschutes National Forest.<br><br>Ruediger,W. et al. August, 2000. **Canada Lynx Conservation Assessment and Strategy.** USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Forest Service Pub #R1-00-53, Missoula, MT. 142pp. |
| GTR-RM-254 | The full citation is: Ruggiero, L.F. Aubry, K.B. Buskirk, S.W. Lyon, L.J. and Zielinski, W.J. Tech. Eds. |

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| Commenters (Cascadia Wildlands) cite this in regards to lynx: "Most of these prey species require adequate cover and areas with little to no disturbance (USFWS, 1999), as well as conifer and vegetative hiding cover (GTR-RM-254)." | 1994. The Scientific Basis for Conserving Forest Carnivores: American Marten, Fisher, Lynx, and Wolverine. General Technical Report RM-254, Fort Collins, Co. U.S. Department of Agriculture, Forest Service. Rocky Mountain Forest and Range Experiment Station. 184p.<br><br>See response to Ruggiero, 1999b; Aubry ,1999 |
| McKelevey (sic), 1999a<br><br>Commenters (Cascadia Wildlands et al.) cite this author within their comment, but no complete citation. It is in regards to lynx: "hares, squirrels, and forest-dependent species are typically associated with dense forest cover, including shrubs and 'dog hair' thickets of small trees." | Self–maintaining populations of lynx in Oregon have not existed historically, and lynx occurrence here is likely the result of dispersal from occupied areas with declining prey populations (Verts and Caraway 1998; McKelvey and Aubrey 2001). At the present time there is no information to suggest lynx are present on the Deschutes National Forest. |
| Koehler and Brittell (1998)<br><br>Commenters (Cascadia Wildlands) cite this author within their comment, but provide an incomplete citation. Regarding lynx: "For example, Koehler and Brittell (1998) predict that it may take up to seven years following high disturbance levels in an area for hares to recolonize the site and up to 25 years before they reach their highest densities." | See response to Ruggiero, 1999b; Aubry ,1999 |
| Bull (1999)<br><br>Commenters (Cascadia Wildlands) cite this author within their comment, but no complete citation. It is in regards to lynx: "As another example, Bull (1999) examined the results of a variety of harvest prescriptions on hares and found that in lodgepole stands, the number of snowshoe hares decreased in all types of harvest." | See response to Ruggiero, 1999b; Aubry ,1999 |
| Ruggiero, 1999a; Buskirk, 1999b; McKelvey, 1999a<br><br>Commenters (Cascadia Wildlands) cite this group of authors within their comment, but no complete citation. It is in regards to lynx: "Squirrels have different habitat needs than snowshoe hares and are associated with mature, cone-producing forests." | See response to Ruggiero, 1999b; Aubry ,1999 |

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| ” Avian Population Trends” by Brian Sharp | This was an incomplete citation by the commenter and we are assuming it was a 1996 publication, which we were able to locate. The commenter did not point out how the Brian Sharp reference differs from the Forest Service findings and cited science. However, the Three Trails OHV DEIS provides a full disclosure of effects to neo-tropical migrants and native rangeland, riparian, and forest-dependent birds using several publications and websites more recent than the Sharp publication. Included in the effects analysis are current rankings and population trends as listed by NatureServe for the state of Oregon and the rationale for the listing if available and citations from the Marshall et al. 2003 book "*Birds of Oregon*". The results of project area avian surveys have also been included as well as the amount and distribution of suitable nesting habitat in the project area The effects of the project on various species have been disclosed in the Management Indicator Species section, Birds of Conservation Concern section, and Threatened, Endangered, and Sensitive Species section of the DEIS. Project Design Features and Mitigation Measures have been incorporated consistent with habitat recommendations found in the Landbird Strategic Plan prepared by the Forest Service in 2000 to maintain, restore, and protect habitat necessary to sustain healthy migratory and resident bird populations to achieve biological objectives. On a more-local level, "*A Conservation Strategy for Landbirds of the East-Slope of the Cascade Mountains in Oregon and Washington* " was authored by Altman (2000) and is also cited in the analysis. This strategy has been used since its development in planning and projects analysis on the Crescent Ranger District.<br>The complete citation: Sharp, Brian E. 1996. Avian Population Trends in the Pacific Northwest. Bird Populations 3:26-45. |
| Robinson et al. 1995<br><br>Commenters (Cascadia Wildlands) cite this author within their comment, but provide an incomplete citation. Regarding neotropical migrant and native birds: “further loss or fragmentation of habitat could lead to a collapse of regional populations of some avian species birds (Robinson et al. 1995).” | This is an incomplete citation and the Forest Service is uncertain which publication the commenter is referring. “Neotropical migrant avian” encompasses a broad category for many different species and their effects are discussed through Chapter 3 under headings for Rare and Uncommon, MIS, TES, and others. Consistency with habitat recommendations found in the Landbird Strategic Plan, which is a strategy developed for the Migratory Bird Treaty Act, starts on page 239 of the FEIS. Consistency with the Migratory Bird Treaty Act is found on page 460 of the FEIS. |
| Transportation Management Plan Cost estimator Description by Michael Wing | The Forest Service has reviewed the spreadsheet from Dr. Wing and although helpful for estimating costs, there are several other factors that were not presented in the model in order for the Responsible Official to make an informed decision. Implementation relies on available funds (which includes grants) and workforce (which includes volunteers). Central Combined Oregon Off-Highway Vehicle Operations (COHVOPS) already has personnel and equipment already in place. Also, timing and location of implementation would occur in segments dependent upon the above resources. The focus would be on creating links to the trail system in strategic places such as |

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| | providing community connections. Also a priority is restoration of riparian areas. A detailed estimate of equipment, personnel, and supplies needed for a trail system is found on page 420 in the FEIS.<br><br>The Forest Service is consistent with 36 CFR 212.55(a) which states: *General criteria for designation of National Forest System roads, National Forest System trails, and areas on National Forest System lands.* In designating National Forest System roads, National Forest System trails, and areas on National Forest System lands for motor vehicle use, the Responsible Official shall consider effects on National Forest System natural and cultural resources, public safety, provision of recreational opportunities, access needs, conflicts among uses of National Forest System lands, the need for maintenance and administration of roads, trails, and areas that would arise if the uses under consideration are designated; and the availability of resources for that maintenance and administration. For an item by item accounting of how the Three Trails OHV Project meets the requirements of the Travel Management Rule, reference page 447 in the DEIS. |
| The following was received electronically from Gaia Kia on the 22nd of November 2010 after the comment period had closed on November 15th 2010. | |
| Barber et al. 2009. The Cost of Chronic Noise Exposure for Terrestrial Organisms. Trends in Ecology and Evolution Vol. 25. No. 3. | This paper supplements what we discussed in the wildlife introduction and various species in Chapter 3 (pgs 148-152) and it does not differ from science presented in the analysis. Throughout the wildlife section of Chapter 3, we go into detail about the effect of noise on communication (i.e. masking causing communication problems between same species and different species), altered behaviors, hearing loss and decrease sound sensitivity, increase in stress hormones, species abundance along road sides, nesting abundance along trails/roadways, and possible increase in predation. The Barber et al. (2009) main points are noise causing problems with communication, altered behaviors, increase in stress hormones, nesting abundance along roadways or in loud areas, and hearing loss. The following are the same references in the paper as in the Three Trails OHV DEIS Chapter 3 Wildlife section. Listed under each reference is how we used the information. Barber et al. (2009) reference is in bold::<br><br>Barton, D.C. and Holmes, A.L. 2007. Off-highway vehicle trail impacts on breeding songbirds in northeastern California. *J. Wildl. Manage*. 71, 1617-1620.<br>• Human made noise can potentially interfere with normal body functioning (i.e. altered behavior, elevated stress, increase stress hormones, etc.). Also these behaviors interrupt foraging, nurturing young.<br>• Large and smaller mammals tend to have lower population densities within 100-200 meters from roads and some may avoid roads.<br>• Many studies show breeding birds near highways and OHV trails have reduced densities, population decline and/or are more likely to abandon their nest |

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| | • Birds are less abundant on recreation trails, though it is unclear if the reduced abundance was because of the trails or the trails decrease habitat. Also, the further away from roads and trails the high abundance of passerine species.<br>• **Greater nest desertion and abandonment in songbirds within 100 meters of off-road vehicle trails.**<br>• **Within the study, at some loud sites predation was decrease and nest success was increased.**<br><br>Forman, R.T.T. and Alexander, L.E. 1998. Roads and their major ecological effects. Ann. Rev. Ecol. Syst. 29, 207–231<br>• Roads and trails provide greater access to habitats previously not accessed to predators.<br>• Large and smaller mammals tend to have lower population densities within 100-200 meters from roads and some may avoid roads.<br>• Many studies show breeding birds near highways and OHV trails have reduced densities, population decline and/or are more likely to abandon their nest.<br>• The further away from roads and trails the high abundance of passerine species.<br>• **Activities from roads caused effects over a mile away.**<br><br>Frid, A. and Dill, L. 2002. Human-caused disturbance stimuli as a form of predation risk. Conserv. Ecol. 6<br>• Small mammals that stay closer to their shelter can tolerate closer encounters with humans.<br>• Human caused disturbance is a form of predation risk. Animals respond to human activities (e.g. walking, motorized vehicles, wildlife viewing) in the same way they might respond to predators.<br>• **Animals may perceive noise as a predation risk and can alter normal (e.g. inducing a flight response).**<br><br>Bowles, A.E. 1995. Responses of wildlife to noise. In Wildlife and Recreationists: Coexistence through Management and Research (Knight, R.L. and Gutzwiller, J., Eds.), pp. 109–156, Island Press<br>• Definition of noise that is used in the wildlife section.<br>• Human made noise can potentially interfere with normal body functioning (i.e. altered behavior, elevated stress, increase stress hormones, etc.). Also these behaviors interrupt foraging, nurturing young.<br>• Large and smaller mammals tend to have lower population densities within 100-200 meters from roads and some may avoid roads.<br>• Various mammal studies have shown mammals may leave an area where noise is, but |

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| | return at some point once the noise is gone.<br>• **"Animal responses may depend upon the intensity of perceived through rather than on the intensity of noise."(**Barber et al. 2009).<br><br>Reijnen, R. et al. 1995. The effects of car traffic on breeding bird populations in Woodland. III. Reduction of density in relation to the proximity of main roads. J. Appl. Ecol 32, 187–202<br>• Many studies show breeding birds near highways and OHV trails have reduced densities, population decline and/or are more likely to abandon their nest<br>• **Bird species abundance was reduced near roads.**<br><br>Preisler,H.K. et al. 2006. Statistical methods for analyzing responses of wildlife to human disturbance. J. Appl. Ecol. 43, 164–172<br>• ATV use research at Starkey found elk appear to adjust their distribution to areas that are not visible from roads while riders were present. Elk appeared to respond to AVTs at long distances (>1,000 meters) and the flight response was higher when they were closer to ATV routes. Also, elk appear to "freeze" while ATVs pass close by (50-100 meters).<br>• **Ungulate response to ATVs and snowmobiles can alter flight behavior and special use.**<br><br>Stankowich, T. 2008. Ungulate flight responses to human disturbance: a review and meta-analysis. Biol. Conserv. 141, 2159– 2173<br>• He showed that humans on foot have more impact on mule deer and other ungulates than other stimuli studied (vehicles, noise, and horseback).<br>• Ungulates pay attention to approacher behavior, have greater perceptions of risk when disturber in open habitats, and that females or groups with young show greater flight responses that adult groups. Also humans on foot were more evocative that other stimuli (vehicles, noise) and that hunted populations showed significantly greater flight responses than non-hunted populations.<br>• **Humans approaching ungulates on foot elicited a stronger behavioral reaction than motorized disturbance.**<br><br>As to the other papers referenced in the research paper, most pertain to noise, in general, masking communication causing confusion within and between species. These are all concepts that we have addressed and discussed throughout the Wildlife section of the Three Trails OHV DEIS Chapter 3.<br><br>Barber J. R., Crooks K. R., Fristrup K. M. 2010. The costs of chronic noise exposure for terrestrial organisms. *Trends Ecol. Evol.* 25, 180–189. doi:10.1016/j.tree.2009.08.002 |

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| | (doi:10.1016/j.tree.2009.08.002). |

# Appendix D-Federal Agency Comments

## U. S. Department of Interior- Office of Environmental Policy and Compliance

## U. S. Environmental Protection Agency- Region 10

## U. S. Department of Agriculture- Forest Service

## U.S. Department of Interior- Fish and Wildlife Service

## Oregon Department of Fish and Wildlife

# United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
620 SW Main Street, Suite 201
Portland, Oregon 97205-3026

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IN REPLY REFER TO
ER10/810

*Electronically Filed*

November 8, 2010

Holly Jewkes
Crescent Ranger District
P.O. Box 208
Crescent, Oregon 97733

Dear Ms. Jewkes:

The Department of the Interior has reviewed the Draft Environmental Impact Statement for the Three Trails Off-Highway Vehicle Project, Crescent Ranger District, Deschutes National Forest, Klamath County, Oregon. The Department does not have any comments to offer.

We appreciate the opportunity to comment.

Sincerely,

Preston A. Sleeger
Regional Environmental Officer

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ECOSYSTEMS, TRIBAL AND
PUBLIC AFFAIRS

November 15, 2010

Holly Jewkes
District Ranger
Crescent Ranger District
P.O. Box 208
Crescent, OR 97733

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CRESCENT R.D.

Re: EPA Region 10 comments on the Draft Environmental Impact Statement for the Three Trails Off-Highway Vehicle Project (EPA Project Number 09-006-AFS)

Dear Ms. Jewkes:

The U.S. Environmental Protection Agency (EPA) has reviewed draft Environmental Impact Statement (DEIS) for the Three Trails Off-Highway Vehicle Project on the Crescent Ranger District of the Deschutes National Forest, Klamath County, Oregon. Our review of the DEIS was conducted in accordance with our responsibilities under National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act.

Section 309 specifically directs the EPA to review and comment in writing on the environmental impacts associated with all major federal actions. Under our Section 309 authority, our review of the DEIS considers the expected environmental impacts, and the adequacy of the EIS in meeting procedural and public disclosure requirements of NEPA.

The Three Trails DEIS examines four alternative Off Highway Vehicle (OHV) trail systems that vary in trail length between 140 and 153 miles. We appreciate the thoughtful approach taken by the District in crafting these alternatives, including the new preferred Alternative E. We support directing motorized use to the most suitable and sustainable places on the landscape, and we are pleased by the emphasis on closing and rehabilitating unneeded roads and trails. We also appreciate the project design criteria added to Chapter 2 in order to afford fens and wetlands along the trail additional protection.

Our review identified questions and concerns that we would like to see addressed in the Final EIS. Our primary concern relates to the scope of the project. We fully recognize that the proposed action alternatives would decrease the overall amount of road and trail on the landscape, and generally improve water quality and habitat. What is less clear is whether the proposed trail system is sized appropriately. The DEIS provides a thorough analysis of the factors that govern rider satisfaction. Less information is provided regarding the minimum amount of trail required to provide a safe and enjoyable riding environment. Given the resource impacts associated with roads and trails, and the Forest Plan exceedances of road density within many of the subwatersheds in the planning area, we encourage the Forest Service to include a quantitative analysis of the minimum trail system required. Our review also raised questions

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about cumulative effects from the four proposed OHV projects on the Forest with regard to wildlife movement and the ability of the Crescent Ranger District to secure adequate resources to implement the proposed education, enforcement, safety, and operational maintenance plan. Each of these concerns is detailed covered in detail in the attached comments.

Based on our analysis, we have rated this DEIS as EC-2 (Environmental Concerns – Insufficient Information). An explanation of this rating is enclosed. We appreciate the effort taken by the Forest Service to inform us about this project and address our concerns to date. We also appreciate this opportunity to provide comments on the Draft EIS. I encourage you to contact me or Teresa Kubo of my staff with any questions at (503) 326-2859 or kubo.teresa@epa.gov.

Sincerely,

Christine B. Reichgott

Christine B. Reichgott, Manager
Environmental Review and Sediment Management Unit

Enclosures

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**EPA Detailed Comments on the Draft Environmental Impact Statement (DEIS) for the Three Trails Off Highway Vehicle Project**
**November 15, 2010**

**Project Scope**

We are pleased with the efforts taken by the Forest Service to improve resource condition while addressing the four "key issues" identified. We are challenged, however, by the lack of quantitative date regarding the carrying capacity of the proposed system, and the minimum amount of trail required in order to provide a safe and rewarding motorized recreation experience. Table 19 indicates current maximum use (holiday weekends) is around 450 visitors, and that average use is 250 visitors. Alternative E would provide each rider (on average) over 2 miles of trail and Class II road. Given the proposed development of the Lava Rock, Ochoco Summit and Meadow Lake OHV areas, and the twelve OHV opportunities close to Crescent Ranger District identified in Table 18, it would be helpful to have carrying capacity information in order to ensure that the trail system is "right sized". We recognize that motorized recreation is likely to continue to gain in popularity. We also note, however, that although the system proposed under Alternative E is an improvement over current condition in terms of road density, 50% of the subwatersheds within the planning area would continue to exceed Forest Plan standards for road density.

**Recommendations:**

- We encourage the Forest to include information regarding minimum trail system requirements in the FEIS.
- We also encourage the Forest to consider a phased approach to trail construction, based upon use trends and thresholds (i.e. do not engage in trail construction unless user data indicate that safety thresholds are likely to be exceeded).

**Cumulative Impacts**

The DEIS does an admirable job of identifying past, present and reasonably foreseeable future actions within the Three Trails project area. Among the projects identified are the Lava Rock, Ochoco Summit and Meadow Lake OHV plans. Although these plans are discussed in reference to cumulative impacts to motorized recreation, they are not discussed in reference to cumulative impacts to wildlife and wildlife movement across the landscape. Likewise, there is no discussion of how these projects will interface in the monitoring and enforcement arena.

**Recommendations:**

- We recommend that the FEIS clarify whether big game populations within the Crescent Ranger District utilize the areas that would be managed under the proposed Lava Rock, Ochoco Summit and Meadow Lake OHV plans; the extent to which wildlife populations are affected by current management; and the extent to which those populations would be affected (cumulatively) by the implementation of the OHV projects in each of these areas.
- We recommend that the FEIS discuss how the four OHV projects within the Deschutes National Forest (along with Cline Buttes if applicable) will interface with regard to monitoring and enforcement, and the extent to which these projects would rely on the

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same pool of resources (volunteers, enforcement officers, etc.). If this analysis indicates that the existing resource base is not adequate to staff, monitor and maintain multiple riding areas, the FEIS should also discuss options to fill that resource gap.

**Document consistency**

We note some inconsistency between tables and other portions of the document. For example, Table 1 indicates that the proposed action (Alternative B) would allow for up to 130 miles of trail, whereas Table 3 indicates that Alternative B would provide for 143 miles. There are similar discrepancies for Alternatives D, and E. Similarly, page 101 of the document indicates that Alternative E would provide for 134 whereas Tables 1, 3 and 4 indicate that Alternative E would provide for 140 miles of trail. In order to allay confusion over the number of miles of trail under each alternative, we recommend that these tables be reconciled.

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**U.S. Environmental Protection Agency Rating System for Draft Environmental Impact Statements Definitions and Follow-Up Action***

**Environmental Impact of the Action**

**LO – Lack of Objections**

The U.S. Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

**EC – Environmental Concerns**

EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts.

**EO – Environmental Objections**

EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

**EU – Environmentally Unsatisfactory**

EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

**Adequacy of the Impact Statement**

**Category 1 – Adequate**

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

**Category 2 – Insufficient Information**

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS.

**Category 3 – Inadequate**

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment, February, 1987.

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USDA United States Department of Agriculture | Forest Service | Deschutes National Forest Crescent Ranger District FAX (541) 433-3224 | PO Box 208 Crescent, OR 97733 (541) 433-3200

**File Code:** 1950
**Date:** December 13, 2010

Christine B. Reichgott
United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

Dear Ms. Reichgott:

Thank you for your response to the Three Trails OHV project. I would like to address your comments regarding project scope and cumulative impacts.

I first wanted to address on how we arrived at the trail system mileage we have proposed. Numerous criteria were utilized to arrive at the mileage:

- We looked at use that is occurring within the project area evidenced by the user-created system and information received through collaboration with the local and non-local users.
- We also factored in the best available science, the Oregon Statewide Comprehensive Recreation Plan, and actual growth that are occurring in nearby areas to "right-size" the trail system.
- We projected use levels into the future based on available research and disclosed our assumptions.
- We looked at access to and distance from amenities and destinations such as scenic views.
- We also recognized that each class of OHV desires a different width and type of trail system. These issues were incorporated into the effects analysis.
- Through identification of key issues and analysis of effects, we attempted to balance the trail system size, needs, and location with resource issues including big game, riparian areas, and non-motorized recreation pursuits.

We recognized that an exact trail mileage number is difficult to identify because of the importance of trail design during implementation. One mile of trail located on a road is not the same experience or time commitment as a mile of trail that has been designed to slow speeds and provide challenge to the user.

I agree with your comment regarding a phased approach to trail construction based on the use and trends that are occurring. We will be implementing this project in several stages, prioritizing areas based on both restoration needs and their importance to establishing a connected trail system. Additionally, implementation will be dependent upon available monies and other resources. All trail construction would include standards that employ safety in trail design, that both provide a high value experience and protect resources.

As for how the Three Trails OHV project relates to other existing and foreseeable riding opportunities in Central Oregon, we have disclosed cumulative effects where they exist. This project addresses use that is occurring within the project area and given the distance from other riding opportunities, it is unlikely that an appreciable amount of visitors would venture from another riding area to the Three Trails OHV area for a day excursion. This is based on local knowledge and monitoring that is occurring at other riding areas, such as East Fort Rock. Regarding your concern as it relates to target road densities found in the Forest Plan, the Three Trails OHV project has identified the minimum road system on over a 93,016-acre project area. The 2.5 miles per square mile road density figure is a target number and was developed in consideration of other uses in the forest in addition to big game. Exceeding target road densities can be a factor of many resource-related reasons, including providing access to private lands and recreation developments/destinations, County and State roads (Highways 58 and 97, County Road 61), and access for fire suppression. Road densities outside of Forest Service jurisdiction can make up a large portion of a total road density within a watershed. In Alternative E, total open road density on Forest Service managed roads drops from 3.8 to 2.0 miles per square mile averaged over 16 subwatersheds. When motorized trails are included in this average, the total is 2.5 miles per square mile.

I know that I have not addressed all of your comments in this letter, but they will be addressed in our FEIS and Record of Decision. If you have any questions or concerns, please do not hesitate to contact me at 541-433-3201 or hjewkes@fs.fed.us.

Sincerely,

*/s/ Holly Jewkes*
HOLLY JEWKES
District Ranger

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

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Reply to: 8330.I 0023(11)
File Name: threetrailsOHVLOCspottedowls.doc
TS Number: 11-189
TAILS: 13420-2011-I-0023
Doc type: Final

December 6, 2010

Mr. John Allen, Forest Supervisor
Deschutes National Forest
1001 SW Emkay Drive
Bend, OR 97702

Subject: Informal consultation on the effects of the Three Trails OHV Project on the Deschutes National Forest on Northern spotted owl (1-7-11-I-0023)

Dear Mr. Allen:

The U.S. Fish and Wildlife Service (Service) has reviewed the Three Trails OHV Project proposed by the U.S. Forest Service for the Deschutes National Forest (NF). Your request for informal consultation and biological assessment, dated November 22, 2010 and November 18, 2010, respectively, were received in our office on November 22, 2010. This document represents the Service's concurrence on the effects of that action, as outlined in the biological assessment (BA), on northern spotted owl (*Strix occidentalis caurina*) (spotted owl) and spotted owl critical habitat in accordance with Section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq*.).

Summary of the Proposed Action

The Deschutes National Forest is proposing designation and construction of an Off-Highway Vehicle (OHV) trail system on the Crescent Ranger District that would close roads, rehabilitate unneeded trails, and develop staging areas within the 93,016 acre Three Trails OHV project area. The Three Trails OHV area is presently used extensively by off-highway enthusiasts, as demonstrated by the many user-created trails, and use of existing roads (closed and open).

The proposed action would implement development of a trail system and staging areas for OHV use in the vicinity of Walker Mountain, Two Rivers North subdivision, and Crescent Lake Junction. Alternative E has been selected as the preferred alternative and incorporates most of the design features that the riders requested including longer loop systems, interconnected trails,

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separating uses as much as possible on the Metolius-Windigo Trail and provide access to public goods and services. The trail system has also been designed to provide tighter loops in some areas to minimize impacts to big game migration corridors. Four staging areas would be developed for access points. There will be a total of 142 miles of trails plus 80 miles of connecting high clearance roads for a total of 222 route miles, including 21 miles of trails engineered for jeeps and other 4-wheel drive vehicles. About 115 miles of currently open Maintenance Level 2 roads not maintained for passenger cars would be closed to offset the creation of engineered trails. Approximately 10 miles of currently open Maintenance Level 2 roads not maintained for passenger cars would be converted to trails. Approximately 94 miles of user-created trails located in inappropriate areas, are redundant or otherwise unnecessary would be closed and rehabilitated. The details of the proposed action are outlined in the Biological Assessment for the Three Trails OHV Project.

Spotted Owl Background

The Three Trails OHV Project is within the range of the spotted owl. The action area has been extensively surveyed for spotted owls. The results of all surveys completed since 2001 in and adjacent to the project area confirm that there are three spotted owl territories (Royce, Hamner, and McCool) that overlap completely or partially within the Three Trails OHV analysis area. Barred owls also have been detected within the project area.

Effects to spotted owl and spotted owl critical habitat

The proposed project will have the potential to affect spotted owls that may be utilizing suitable habitat within a 660 foot distance on either side of open travel routes. Spotted owls foraging in suitable habitat adjacent to travel routes may be disrupted by use of travel routes by OHVs. OHVs and other motorized vehicles create abrupt disturbances that are usually short duration. Disturbance to activity centers (i.e., nest sites) is not anticipated since all activity centers are greater than 660 feet from open routes. Overall, project implementation will result in a reduction of open travel routes and affected habitat.

Conclusion

Based on information contained within the biological assessment, meetings and conversations with Forest Service staff, the Service concurs with the Forest Service's determination that this project is not likely to adversely affect spotted owl or spotted owl critical habitat.

The following rationale is provided for our concurrence on spotted owl:

1. There will be no new road (jeep trail) or trail construction or creation of staging areas within stands of suitable habitat or spotted owl home ranges.

2. The project will not remove suitable habitat for spotted owl.

3. Spotted owl surveys have been conducted in the project area since 2001. Disturbance to known nest sites at Royce Mountain, Hamner Butte and McCool Buttes is not anticipated. Open motorized routes are greater than ¼ mile away from the Royce Mountain activity center and less than ¼ mile away from the Hamner and McCool activity centers. Disturbance to the Hamner and McCool spotted owl nest sites is not anticipated since these sites are greater than 660 feet from existing open travel routes.

4. Project implementation will reduce the amount of disturbed suitable habitat (i.e., within 660 feet from a designated motorized route) for spotted within the project area and within spotted owl home ranges (Tables 5 and 7 in the BA);

5. Although the BA states that there may be an increase of motorized use of open routes of 2.5 to 5.6 percent a year, the use of those open routes will not be an additive effect to spotted owls, since the zone of disturbance already exists within 660 feet of the existing motorized route.

6. Spotted owl foraging adjacent to open motorized routes may be disrupted. However, there is ample foraging habitat in the project area to support spotted owl foraging needs.

7. Spotted owls are highly unlikely to nest in the suitable habitat within the 660 feet disturbance buffer adjacent to open motorized routes.

The following rationale is provided for our concurrence on spotted owl critical habitat:

1. No primary constituent elements (PCE) of spotted owl critical habitat will be removed through implementation of this project.

2. No roads or trails will be constructed within the Critical Habitat Unit.

3. Project implementation will reduce the amount of suitable habitat (i.e., PCE of nesting, roosting and foraging habitat) subject to disturbance along motorized routes from 1,362 (85%) to 595 (37%) acres.

4. Project implementation will reduce the acreage of dispersal habitat subject to disturbance from 2,346 (77 %) to 754 (25 %) acres. Ongoing use of the open travel routes will not affect dispersal habitat and its function as a PCE.

This concludes informal consultation on the actions outlined in your biological assessment. The requirements established under section 7(a)(2) and 7(C) of the Endangered Species Act of 1973, as amended (16 USC 1531 *et seq.*), have been met, thereby concluding the consultation process. However, if new information reveals effects of the action may affect listed species or critical habitat in a manner or to an extent not considered in your biological assessment, then re-initiation of consultation may be warranted.

If you have any questions or concerns regarding this letter, please contact Jennifer O'Reilly or me at the Bend Field office at 541-383-7146.

Sincerely,

Nancy Gilbert

Nancy Gilbert
Field Supervisor

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Cc: Holly Jewkes, District Ranger, Crescent RD
Lauri Turner, Forest Wildlife Biologist, Deschutes NF
Paul Miller, Wildlife Biologist, Crescent RD
Joan Kittrell, Wildlife Biologist, Crescent RD

#14

Oregon
Theodore R. Kulongoski, Governor

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November 12, 2010

Holly Jewkes, District Ranger
Crescent Ranger District
P.O. Box 208
Crescent, Oregon 97733

RE: Three Trails OHV Project DEIS

It is the policy of Oregon Department of Fish and Wildlife (Department) to manage fish and wildlife to prevent serious depletion of indigenous species and to provide optimum recreational and aesthetic benefits for present and future generations of the citizens of this state (ORS 496.012).

The Department reviewed the Three Trails Off-Highway-Vehicle (OHV) Project Draft Environmental Impact Statement (TT DEIS) and we still believe a forest-wide comprehensive travel management plan is needed to fully understand the consequences of any of the site specific OHV system plans currently in the NEPA process. Likewise, prior to a final Record of Decision (ROD) for the 2009 Deschutes and Ochoco National Forest Travel Management Draft Environmental Impact Statement (TM DEIS), it will be hard for the Department to understand the juxtaposition of the TT DEIS plan with the TM DEIS ROD. Moreover, we would like to see the TT DEIS findings for fish and wildlife impacts and/or benefits and related recreational opportunity to be consistent with the TM DEIS ROD. Based on the above considerations we provide the following comments:

Overall, this is one of the better Draft Environmental Impact Statements with information on affects to forest resources particularly wildlife resources that the Deschutes National Forest has produced in recent years. That said there are some areas where further assessments and tradeoff information is needed. First, stating that all TT DEIS action alternatives will be consistent with the TM DEIS ROD (pg 33) seems to be "pre-decisional" thereby basing the TT DEIS action alternatives on predetermined conclusions. Likewise the relationship between the TT DEIS No Action Alternative and the imminent TM DEIS ROD is not clearly described. Furthermore, many of the TT DEIS resource benefits and OHV impacts as a result of the action alternatives are proposed to be rectified in the TM DEIS. Second, foreseeable actions are listed, yet few project analysis findings are correlated with foreseeable actions. Third, additional tradeoff assessments are needed between OHV and non-OHV user activities, with emphasis on activities projected to increase significantly in the future. Fourth, there are areas with high value fish and wildlife habitat and related recreational opportunities that could be conserved more fully. Fifth, after the extensive TT DEIS planning process, no clear rationale was presented as to why 8 to 10 of the 16 sub watersheds have remaining road and trail densities greater than 2.5 miles per square mile. Sixth, there is little monitoring proposed to determine success or project modification needs to meet the TT DEIS and Deschutes National Forest (DNF) objectives now and in the future.

**No Action Alternative:**

Stating that all TT DEIS action alternatives will be consistent with the TM DEIS ROD (pg 33) seems to be "pre-decisional" thereby basing the TT DEIS action alternatives on predetermined conclusions. A

suggested approach would be to defer the TT DEIS until the TM DEIS ROD is finalized, thereby making the ROD resulting travel management conditions the No Action Alternative, or to include another alternative that would reflect the anticipated TM DEIS ROD travel management conditions that the TT DEIS action alternatives could be assessed against.

Additionally, the TT DEIS states that all action alternatives will be consistent with the imminent TM DEIS ROD (pg 33), yet it doesn't include the No Action Alternative. Does this mean if the TT DEIS No Action Alternative is chosen it will supercede the TM DEIS ROD, thereby retaining existing conditions within the project boundary (i.e., cross-country travel, user created trails, etc)? The Department requests the TT DEIS provide a clear understanding of the relationship between the imminent TM DEIS ROD and the TT DEIS No Action Alternative.

The TT DEIS No Action Alternative describes many existing conditions that by way of the imminent TM DEIS ROD are proposed to be rectified: cross-country travel, user created trails, motorized use of closed level 1 roads, a transportation system that is unenforceable, etc. By not tying the TT DEIS to the TM DEIS ROD, the outcomes of the TT DEIS seem to over-state the benefits the action alternatives provide to offset ongoing impacts to forest resources in particular wildlife resources, while over-stating projected impacts to OHV users. In reality, the TM DEIS ROD could be the best alternative for fish and wildlife resources and recreational opportunity. An example of this potential outcome is a combination of Tables 107 & 109 (pg 386 & 389) that show 8 to 11 out of 16 sub-watersheds for the TT DEIS action alternatives (roads + trails) exceed the anticipated TM DEIS ROD road density (Appendix A). Likewise, 12 to 13 of the subwatersheds exceed 2.5 miles per square mile as a result of the TT DEIS action alternatives versus 11 for the anticipated TM DEIS ROD road density (Appendix B). Tied to this example is the recognition that the TT DEIS project area only encompasses 40% of the 16 subwatersheds used for analysis and that the change in road densities associated with closing roads and adding trails could be misleading. Changes in road and trail densities could be much greater within the project area than what is presented.

If the TT DEIS action alternatives will cause resource impacts to the anticipated TM DEIS ROD travel management conditions, then it is important for this information to be clearly presented to the decision maker and our constituents to ensure all interests are aware of the natural resource and recreational tradeoffs proposed for each action alternative. The Department recommends deferring the TT DEIS until the TM DEIS ROD is finalized, thereby making the ROD resulting travel management conditions the No Action Alternative conditions, or to include another alternative that would reflect the anticipated TM DEIS ROD travel management conditions that the TT DEIS action alternatives could be compared to. Taking either approach should help assure that the TT DEIS findings for fish and wildlife impacts and/or benefits and related recreational opportunities are consistent with the TM DEIS ROD.

**Foreseeable Actions:**
Foreseeable actions are listed, yet few project findings are correlated with foreseeable actions. As an example, the Rim Paunina EIS (pg 71) proposes vegetation manipulation that will likely significantly reduce big game hiding cover within 660 feet of roads, particularly in ponderosa pine plant associations and along roads identified as safety corridors, yet the TT DEIS shows hiding cover to occur on 63% to 69% of the land within 660 feet of a road (pg 267). As presented to the Rim Paunina EIS

collaborative group, within five years of implementation of the Rim Paunina project this figure will likely be altered significantly. The Department recommends information be provided (i.e., table form) to better describe the relationship between this project and other foreseeable actions that will likely significantly alter values presented in the TT DEIS.

**Tradeoff Analysis between OHV and Non-OHV Users**:
Additional tradeoff assessments are needed between OHV and non-OHV user activities, with emphasis on activities projected to increase significantly in the future (pg 89). There are few project findings that describe how any of the alternatives will affect other recreational participants within the Three Trails project area boundary, currently or in the future. An abundance of information is presented on OHV recreational use and how it has changed over the years. In fact the amount of information presented gives the impression that OHV recreation is significantly more important than all other recreational activities.

Following the extensive OHV section, summarized information is presented for all user participation on the DNF that includes percentage figures for individual user group (pg 76). Unfortunately, this information lacks details on how these groups use the TT DEIS area or the DNF. Included in the information is a subset of six groups projected to increase most rapidly in the future (pg 89). Information presented shows that a small percent (2.1%) of all DNF participants take part in OHV activities (pg 76). It also identifies activities with the greatest growth in the next 10 years to be viewing/photographing wildlife/birds (wildlife viewing) (25.1%)[1], general relaxing (33.8%)[1], viewing other features (43.3%)[1], hiking/walking (40.6%)[1], fishing (16.1%)[1], and driving for pleasure (14.4%)[1]. This is all helpful information; however what's missing is a clear assessment and discussion about the tradeoffs between present and future OHV and non-OHV activities and participants by alternative within the project boundary. Of particular interest to the Department are the tradeoffs between proposed OHV activities and the identified growth for wildlife viewing and fishing activities.

Given the economic and recreational value of fishing, hunting, and wildlife viewing, mostly presented in Table 77 (pg 262), along with the predicted growth of wildlife viewing and fishing (pg 89), a better assessment and discussion of findings is needed to understand how each TT DEIS Alternative will impact/benefit current and projected fish and wildlife recreational activities and participation. Likewise, a clear projection of the annual OHV growth for the No Action Alternative (dispersed OHV recreation) versus the annual OHV growth for any of the Action Alternatives (developed OHV destination) is needed to better understand the potential conflicts by these different alternatives with natural resources and other non-OHV activities and participants over time. The Department recommends an assessment and discussion of the findings be conducted by alternative to provide an understanding of the tradeoffs between current and projected OHV and non-OHV activities and participation with emphasis on the six activities with greatest growth including wildlife viewing and fishing.

**High Value Fish and Wildlife Habitat and Related Recreational Opportunities:**
TT DEIS describes throughout the document the importance of riparian and wetland areas for fish and wildlife resources and associated recreational activities. Likewise, the DNF Land and Resource

[1] Percentages are for current participation use figures

Management Plan (LRMP) recognizes that riparian and wetland areas "make up a minor portion of the landscape" (LRMP 4-61), which has been estimated to be about three percent of the DNF. The Department appreciates staff efforts to conserve these important areas, particularly the Key Elk Areas, and we support actions that conserve fish and wildlife and their habitats. However, given the importance of riparian and wetland areas for fish and wildlife habitats, species, and associated current and projected recreational opportunities; along with their scarcity within the project boundary let alone the DNF; the Department recommends closing most[2] OHV activity within 0.89 miles (pg 103) of riparian and wetland areas to further meet conservation of fish and wildlife resources and projected recreational desires. This action could provide noise free recreational opportunities for most of the rapidly growing activities on the forest (pg 89). If OHV participants are predicted to increase annually between 2.5% to 5.6% (49% to 72% in 10 years) (pg 92), then participation for the most rapidly growing recreational pursuits should increase even faster. This could result in current user destinations reaching capacity in the near future with a need to develop and provide opportunities elsewhere on the DNF, particularly in areas near water. As an example, both the Little Deschutes and Crescent Creek support native and nonnative salmonids that provide recreational opportunity. Stream fishing opportunities are limited south of Bend and the Three Trails area provides an opportunity for anglers to pursue their trade away from the more popular parts of the Crescent Ranger District. Given the projected increase in anglers, the Department expects this fishery to be of increasing importance overtime.

Information is needed that describes how implementation of any of the TT DEIS Action Alternatives will affect the ability to provide for these increasing non-OHV recreational activities now and into the future, particularly for fish and wildlife related activities.

The TT DEIS recognizes the importance of the Walker Mountain area for migrating mule deer by limiting trail development and user class. The Department appreciates staff efforts and we support identified actions that provide for migrating mule deer and associated recreational benefits.

**Road and OHV Trail Densities Greater than 2.5 miles/ mile$^2$:**
After the extensive TT DEIS planning process, no clear rationale was presented as to why 8 to 10 (depending on TT DEIS Action Alternative) of the 16 sub watersheds have remaining road and OHV trail densities greater than 2.5 miles/ mile$^2$ (pg 267 & 273). The Forest Service touted to the Travel Management Collaborative Working Group that development of individual OHV systems was the planning process to use to reduce overall motorized road and trail densities to meet the LRMP road density target of 2.5 miles per square mile. A more comprehensive Travel Management Plan that addresses road and trail densities forestwide was identified as a major concern by several working group members including the Department. Rationale is needed to address working group member concerns identified in the June 4, 2007 PAC Travel Management Strategy Recommendation – A2-Community Support Areas eighth bullet, and Crescent Landscape Area sixth bullet. The Department requests a clear discussion be presented explaining why as a result of the extensive TT DEIS planning process that the 2.5 miles per square mile target road density (LRMP 4-58) wasn't met for 5 to 8 of the 16 sub-watersheds analyzed (pg 267), with an even greater number 8 to 10 sub-watersheds out of 16 being over 2.5 miles per square mile when a developed OHV System is added (pg 273).

[2] Such as 99% with some end point OHV access to a small portion of open water areas.

**Monitoring**:
The TT DEIS presents information on methods likely to be employed by Central Oregon Combined Off-Highway Vehicle Operations (COHVOPS) to ensure riders follow existing state OHV regulations and Three Trail regulations yet to be developed (pg 413), yet monitoring to determine project impacts/benefits on other users and resources is almost non-existent. Very little monitoring is identified to determine project success or modification needs to meet project objectives. No ecological or social thresholds are established, no future project reviews are proposed, no assessment of a user's recreational experience is suggested, no assessment is proposed to determine if OHV users displace other users (i.e., along water bodies), etc. (pg 58). In light of potential conflicts with the rapidly growing non-OHV recreational activities (pg 89), the low percentage of OHV participants out of all forest participants (pg 76/77), and the total forest landscape affected by OHV activities outside of wilderness areas (88% of the DNF 2009 TM DEIS pg 218), the Department recommends a clear monitoring plan be developed that includes the themes identified above to ensure project and more expansive DNF objectives are met over time.

Thank you for working with Department staff during the planning process, developing alternatives that help address our concerns, and discussing the TT DEIS with us. Hopefully our comments will result in a plan that meets the project Purpose and Need while better conserving fish and wildlife resources and providing for future fish and wildlife recreational desires. Likewise, we recognize the tremendous effort the TT DEIS staff invested in this project, particularly efforts to address big game issues, and our comments in no way diminish those efforts or the quality of work presented. Rather our comments are aimed at assessments and information needed by the Department before we can support one of the proposed Action Alternatives.

Sincerely,

Glen Ardt
Deschutes Watershed
Wildlife Habitat Biologist

cc: Lauri Turner
Joan Kittrell
Paul Miller

**Appendix A**

Table 107 Operational Open Road Density – Subwatershed Basis (Mile/Square Mile) plus Table 109 Motorized Trail Density for Alt B - E – Subwatershed (Mile/Square Mile)

| Subwatershed Name | Alt A (Operational Roads Only) | Operational Road + Trail Densities[3] | | | |
|---|---|---|---|---|---|
| | | Alt B | Alt C | Alt D | Alt E |
| Bunny Butte – FS Roads + Trails | 1.83 | 1.86 | 2.59 | 2.98 | 2.52 |
| FS Roads + Other Roads + Trails | 3.06 | 3.08 | 3.82 | 4.21 | 3.75 |
| Clover Butte | 1.02 | 1.20 | 0.74 | 0.68 | 0.68 |
| | 1.44 | 1.61 | 1.16 | 1.10 | 1.10 |
| Cold Creek (key elk) | 1.04 | 2.10 | 1.54 | 1.53 | 1.53 |
| | 2.10 | 3.15 | 2.60 | 2.59 | 2.59 |
| Corral Springs | 0.62 | 0.61 | 0.59 | 0.82 | 0.80 |
| | 5.69 | 5.69 | 5.78 | 6.03 | 5.99 |
| Crescent Butte | 2.82 | 2.41 | 1.46 | 1.21 | 1.03 |
| | 6.13 | 5.72 | 4.77 | 4.53 | 4.34 |
| Gilchrist Junction | 2.38 | 1.67 | 2.90 | 2.54 | 2.59 |
| | 4.74 | 4.04 | 5.27 | 4.53 | 4.34 |
| Hemlock Creek (key elk) | 1.66 | 2.30 | 1.81 | 1.26 | 1.98 |
| | 1.99 | 2.63 | 2.13 | 1.59 | 2.30 |
| Little Odell Creek | 2.96 | 2.59 | 3.37 | 4.31 | 3.09 |
| | 3.58 | 3.22 | 3.99 | 4.93 | 3.71 |
| Little Walker Mountain | 2.72 | 4.07 | 3.42 | 3.72 | 3.58 |
| | 3.58 | 4.95 | 4.30 | 4.60 | 4.46 |
| Lower Big Marsh Creek | 1.20 | 1.20 | 1.09 | 1.02 | 1.09 |
| | 1.43 | 1.43 | 1.32 | 1.25 | 1.32 |
| Lower Crescent Creek | 1.33 | 1.33 | 1.58 | 1.33 | 1.62 |
| | 3.34 | 3.34 | 3.59 | 3.34 | 3.63 |
| Middle Crescent Creek | 2.29 | 1.87 | 2.11 | 1.87 | 2.01 |
| | 3.20 | 2.78 | 3.02 | 2.78 | 2.92 |
| North Paunina | 1.90 | 2.69 | 2.58 | 1.75 | 1.87 |
| | 2.99 | 4.62 | 4.59 | 3.68 | 3.98 |
| North Walker | 0.13 | 0.13 | 0.04 | 0.07 | 0.04 |
| | 3.78 | 3.78 | 3.72 | 3.72 | 3.72 |
| Odell Creek | 1.74 | 1.86 | 1.86 | 1.86 | 1.86 |
| | 2.06 | 2.17 | 3.58 | 2.17 | 2.17 |
| South Paunina | 2.81 | 4.14 | 2.88 | 3.95 | 3.66 |
| | 4.08 | 5.41 | 5.60 | 5.21 | 4.93 |
| FS Roads + Trails Density > Alt A | | 8 | 10 | 8 | 10 |
| FS Roads + Other Roads + Trails Density > Alt A | | 8 | 11 | 8 | 10 |

[3] Table 107 Operational Road Densities plus Table 109 Motorized Trail Densities for Alternatives A-E. Not adding Alternative A Motorized Trail Density to Alternative A Operational Road Density is based on the assumption that the trail density is from user created trails that are expected to be closed under the TM DEIS ROD.

**Appendix B**

Table 107 Operational Open Road Density – Subwatershed Basis (Mile/Square Mile) plus
Table 109 Motorized Trail Density for Alt B - E – Subwatershed (Mile/Square Mile)

| (% Subwatershed – table 40) Subwatershed Name | Alt A (Operational Roads Only) | Operational Road + Trail Densities | | | |
|---|---|---|---|---|---|
| | | Alt B | Alt C | Alt D | Alt E |
| (50.4%) Bunny Butte– FS Roads + Trails | 1.83 | 1.86 | 2.59 | 2.98 | 2.52 |
| FS Roads + Other Roads + Trails | 3.06 | 3.08 | 3.82 | 4.21 | 3.75 |
| (11.9%) Clover Butte | 1.02 | 1.20 | 0.74 | 0.68 | 0.68 |
| | 1.44 | 1.61 | 1.16 | 1.10 | 1.10 |
| (60.3%) Cold Creek (key elk) | 1.04 | 2.10 | 1.54 | 1.53 | 1.53 |
| | 2.10 | 3.15 | 2.60 | 2.59 | 2.59 |
| (20.5%) Corral Springs | 0.62 | 0.61 | 0.59 | 0.82 | 0.80 |
| | 5.69 | 5.69 | 5.78 | 6.03 | 5.99 |
| (34.5%) Crescent Butte | 2.82 | 2.41 | 1.46 | 1.21 | 1.03 |
| | 6.13 | 5.72 | 4.77 | 4.53 | 4.34 |
| (19.2%) Gilchrist Junction | 2.38 | 1.67 | 2.90 | 2.54 | 2.59 |
| | 4.74 | 4.04 | 5.27 | 4.53 | 4.34 |
| (54.0%) Hemlock Creek (key elk) | 1.66 | 2.30 | 1.81 | 1.26 | 1.98 |
| | 1.99 | 2.63 | 2.13 | 1.59 | 2.30 |
| (88.0%) Little Odell Creek | 2.96 | 2.59 | 3.37 | 4.31 | 3.09 |
| | 3.58 | 3.22 | 3.99 | 4.93 | 3.71 |
| (89.5%) Little Walker Mountain | 2.72 | 4.07 | 3.42 | 3.72 | 3.58 |
| | 3.58 | 4.95 | 4.30 | 4.60 | 4.46 |
| (24.9%) Lower Big Marsh Creek | 1.20 | 1.20 | 1.09 | 1.02 | 1.09 |
| | 1.43 | 1.43 | 1.32 | 1.25 | 1.32 |
| (4.8%) Lower Crescent Creek | 1.33 | 1.33 | 1.58 | 1.33 | 1.62 |
| | 3.34 | 3.34 | 3.59 | 3.34 | 3.63 |
| (50.7%) Middle Crescent Creek | 2.29 | 1.87 | 2.11 | 1.87 | 2.01 |
| | 3.20 | 2.78 | 3.02 | 2.78 | 2.92 |
| (42.0%) North Paunina | 1.90 | 2.69 | 2.58 | 1.75 | 1.87 |
| | 2.99 | 4.62 | 4.59 | 3.68 | 3.98 |
| (4.6%) North Walker | 0.13 | 0.13 | 0.04 | 0.07 | 0.04 |
| | 3.78 | 3.78 | 3.72 | 3.72 | 3.72 |
| (1.8%) Odell Creek | 1.74 | 1.86 | 1.86 | 1.86 | 1.86 |
| | 2.06 | 2.17 | 3.58 | 2.17 | 2.17 |
| (50.6%) South Paunina | 2.81 | 4.14 | 2.88 | 3.95 | 3.66 |
| | 4.08 | 5.41 | 5.60 | 5.21 | 4.93 |
| FS Roads + Trails Density > 2.5 mi/sq mi | 4 | 4 | 6 | 5 | 5 |
| FS Roads + Other Roads + Trails > 2.5 mi/sq mi | 11 | 13 | 13 | 12 | 12 |