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Draft Environmental Impact Statement

Off-highway Vehicle (OHV) Management Plan, including Forest Plan Admendment #17

Mt Hood National Forest
Clackamas, Hood River, Multnomah, and Wasco Counties

Draft EIS

Off-highway Vehicle (OHV) Management Plan, Including Forest Plan Amendment #17

Draft Environmental Impact Statement
Clackamas, Hood River, Multnomah and Wasco Counties

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Guiding Framework for Off-Highway Vehicle Management on the Mt. Hood National Forest

Preamble

Roads constructed to support decades of timber harvesting on the Mt. Hood National Forest (the Forest) has created an extensive legacy road system, which spans approximately 3,383 miles. Maintaining this vast road system has largely been funded by Congressional appropriations for timber sales. However, as timber harvesting has been reduced from 370 million board feet in 1990 to about 25 million board feet today, road maintenance funding has dramatically reduced as well. While reduced timber traffic has reduced maintenance needs, the maintenance needs associated with recreation and weather have not decreased. With the continued deterioration of the Forest's transportation system coupled with greatly diminished finances, we have been forced to make tough administrative decisions to reduce maintenance needs.

In order to better manage the Forest's transportation system, we have embarked on several planning processes that address travel and access management. This project – aimed specifically at managing off-highway vehicles (OHVs) – is just one of these planning processes. We have also embarked on an aquatic restoration planning process, in which we will review approximately 20 percent of the existing road system each year to identify roads to decommission or close. Also, the Forestwide *Roads Analysis* (2003), which assessed the environmental risks, access needs, and costs of roads, will inform all decisions related to achieving a minimum road system needed for safe and efficient travel and for managing the Forest lands (FSH 7709.55, Chpt 20 (January 8, 2009)). In the end, these efforts, along with future efforts, will systematically lead us to achieving our end goal of having a manageable, responsible transportation system.

This project focuses on OHV management across the Forest with the goal of designating roads, trails and areas for OHV use by class of OHV and time of year. We developed the following principles to guide the project and achieve this goal.

Guiding Principles

- The Forest will designate an OHV system that will set the stage for future access management decisions.

- The Forest recognizes that honoring relationships with other government agencies is a vital condition for the long-term success of managing OHV recreation on the Forest.

- The OHV system designated should reflect that the Mt. Hood National Forest is not a key OHV recreation destination in the Pacific Northwest.

- The safety of all visitors to the Forest, including motorized and non-motorized recreationalists, is an important consideration in designating OHV roads, trails and areas.

Abstract

The purpose of this project is to designate roads, trails and areas for Off-highway Vehicles (OHV) use by class of OHV and time of year. The Mt. Hood National Forest (Forest) is proposing to designate and construct OHV routes on the Forest to provide motorized recreation opportunities. Also, the Forest proposes a Forest Plan Amendment to change the current management direction in the Mt. Hood Land and Resource Management Plan to comply with 36 CFR Parts 212, 251, 261, and 295 – Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule [Federal Register Vol. 70, No. 216 (2005)] (Final Travel Management Rule). Although the Final Travel Management Rule addresses all motor vehicle access and travel management, this project focuses on OHV use on the Forest. The Scope of the Project Section of Chapter 1 explains how the Forest is complying with all components of the Final Travel Management Rule.

The Mt. Hood National Forest OHV Management Plan strives to balance recreation opportunities for OHV use with other recreational uses of the National Forest and resource sustainability. The Final Travel Management Rule states that the US 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 will enhance public enjoyment of National Forests while maintaining other important values and uses of NFS [National Forest Systems] lands" (page 68265).

Four alternatives were developed: Alternative 1 – No Action Alternative; Alternative 2 – Proposed Action; Alternative 3; and Alternative 4.

The No Action Alternative represents the current conditions. Based on direction in the Forest Plan, the implied policy on the Forest is "open unless posted closed." Overall, this alternative allows OHV use on 2,463 miles of roads, 49 miles of motorized trails, and 394,886 acres of forestland. The Proposed Action (Alternative 2), Alternative 3 and Alternative 4 would change OHV access through much of the Forest by designated roads, trails and areas The Proposed Action focuses on travel management within six locations, and allows OHV use on 124 miles of road and 97 miles of trail. Alternative 3 focuses on travel management within eight locations, and allows OHV use on 223 miles of roads and 102 miles of trails. Alternative 4 focuses on travel management within three locations, and allows OHV use on 59 miles of roads and 40 miles of trails. All of the action alternatives include a Forest Plan Amendment, which would limit OHV use to designated routes, prohibit cross-country travel, replace the enforcement tool to the Motor Vehicle Use Map (MVUM), and remove the requirement to post areas or roads as closed.

Implementing any of the action alternatives would comply with the Final Travel Management Rule. All the action alternatives provide motorized recreation opportunities across the Forest and balance this use with non-motorized recreation opportunities. After a decision is made, all cross-country OHV travel and associated resource damage would be eliminated.

The Preferred Alternatives for this project are Alternatives 3 and 4. These alternatives best respond to the public comments received during the scoping period.

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1.0. Purpose and Need for Action

1.1. Document Structure

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

- Chapter 1: Introduction – This chapter includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Mt. Hood National Forest informed the public of the proposal and how the public responded.

- Chapter 2: Comparison of 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 project design criteria. 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. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.

- Chapter 4: Agencies and Persons Consulted – This chapter provides a list of preparers and agencies consulted during the development of the environmental analysis.

- Appendices – The appendices provide more detailed information to support the analyses presented in the EIS.

Additional documentation, including more detailed analyses of project area resources, may be found in the project record located at the Mt. Hood National Forest Headquarters Office in Sandy, Oregon.

1.2. Background

Recreation is an important value and use of Mt. Hood National Forest (the Forest). Off-highway vehicle (OHV)[1] riders and non-motorized recreation visitors share an interest in enjoying outdoor recreation in a natural environment. OHV recreation is a legitimate activity on National Forest System lands; however, unmanaged and inappropriate OHV use is a potential threat to ecosystem sustainability.

The current OHV use policy for the Forest was developed during land management planning in the 1980s. The current policy allows OHVs to venture off roads and trails in areas that have not been specifically closed to off-road use. Additionally, current state law allows OHVs to operate on any road open to the public which is not paved. (For more information on current Oregon State Laws regarding Off-Road Vehicles; Snowmobiles; All-Terrain Vehicles go to: http://www.oregon.gov/OPRD/ATV/links.shtml). Many gravel and native surface roads on the Forest meet these criteria and thus are open to OHV travel. Since these policies were established, there has been rapid growth in the popularity and use of OHVs. There has also been a trend toward closing private lands adjacent to the Forest to OHV use. These two trends have resulted in significantly increased use of the Forest by OHVs.

The designation of OHV roads, trails, and areas (OHV systems) would enhance management of the Forest; sustain natural resource values through more effective management of OHV use; enhance opportunities for motorized recreation experiences; and preserve areas of opportunity for non-motorized travel and experiences. This EIS

1 Off-highway vehicle (OHV) is defined as: "Any motor vehicle designed for or capable of cross country travel on or immediately over land, water, sand, snow, ice, ash, swampland, or other natural terrain" [Federal Register Vol. 70, No. 216 (2005), p. 68288]. OHV is also referred to as an all-terrain vehicle (ATV).

discloses the effects of establishing and designating a system of roads, trails and areas for OHV use, not including over-snow vehicles. Designations are made by class of OHV and by time of year. The decisions resulting from the final EIS will be used to prepare a Motor Vehicle Use Map (MVUM) for the Forest, which is expected to be published in 2010.

The Final Travel Management Rule only allows motor vehicles on designated roads, trails and areas, and directs that routes be designated on a MVUM. The MVUM would display the roads, trails and areas designated for motor vehicle use (licensed and non-licensed vehicles) by vehicle class and, if appropriate, time of year. The map would be standardized nationally to facilitate user compliance and reduce variation between National Forests. It is a single purpose map necessary for the enforcement of the prohibition. The map would be produced in accordance with the Forest Service "Motor Vehicle Use Map Production Guide" (originally published June 2006; recently published April 2009). Based on Regional Direction, the MVUM "is to be updated and published annually. The initial publication should be as soon as practical after making Forest travel management decisions. Updated motor vehicle use maps shall be published annually in January" (R6 Guidelines, 9/6/2006). When the maps are updated each year, changes to the designated OHV routes or Forest Road system would be incorporated. Prior to publishing any changes, the routes or roads would have to be changed through a NEPA decision or Forest Order.

1.3. Scope of the Project

The scope of the project is to designate which roads, trails and areas on the Forest that would be used by OHVs. The resulting Record of Decision will designate roads, trails and areas open to OHV use (by vehicle class and time of year), and these designated roads, trails, and areas will be displayed on the MVUM. The other components of the Final Travel Management Rule are addressed through other decision processes as described below.

The project is being undertaken within the context of the Final Travel Management Rule (36 CFR Parts 212, 251, 261, and 295 – Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule [Federal Register Vol. 70, No. 216 (2005)]). The purpose of the Final Travel Management Rule is to provide for: "a system of National Forest System roads, National Forest System trails, and areas on National Forest System lands that are designated for motor vehicle use. After these roads, trails, and areas are designated, motor vehicle use, including the class of OHV and time of year, not in accordance with these designations is prohibited by 36 CFR 261.13. Motor vehicle use off designated roads and trails and outside designated areas is prohibited by 36 CFR 261.13" (Subpart B, §212.50(a), page 68289).

The Final Travel Management rule states that, in providing for a system of National Forest System roads, trails and areas for motor vehicle use that: "The responsible official may incorporate previous administrative decisions regarding travel management made under other authorities, including designations and prohibitions of motor vehicle use, in designating National Forest System roads, National Forest System trails, and areas on National Forest System lands for motor vehicle use under this subpart" (Subpart B, §212.50(b), page 68289). The designations described above include motor vehicle access, OHV use, motor vehicle use for dispersed camping, and motor vehicle use for game retrieval. Subpart C of the Final Travel Management Rule provides regulations of use by over-snow vehicles on National Forest System roads, trails and areas (Subpart C, §212.80, page 68290).

The following sections describe how the Forest has addressed each component of the Final Travel Management Rule. The sections include: motor vehicle access, motor vehicle use for dispersed camping, motor vehicle use for game retrieval, use by over-snow vehicles, and use by off-highway vehicles on National Forest System roads, trails, and lands.

Licensed Motor Vehicle Access

This project and the resulting decision will not change the access for licensed motor vehicles on open roads throughout the Forest. The responsible official will designate all existing administrative decisions regarding designations and prohibitions of licensed motor vehicle use on National Forest System roads on the MVUM as permitted by the Final Travel Management Rule in Subpart B, §212.50(b) (page 68289). The existing administrative decisions include all existing NEPA decisions regarding roads management, including closing (year round or seasonal), decommissioning, storm proofing, and upgrading roads as well as all administrative decisions pursuant to 26 CFR 212.50(b) and Forest Service Manual 7715.

Future NEPA decisions regarding the road system will be designated on the MVUM during the annual map update process. Currently, the Forest is reviewing select watersheds to identify roads to decommission or close for restoration purposes. The Forest plans to review approximately 20 percent of the existing road system each year. In 2009, the Forest completed the planning for the Clackamas Road Decommissioning for Habitat Restoration Project and the Forestwide Road Decommissioning for Aquatic Restoration Project. In fiscal year 2010, the Forest plans to make another decision regarding road decommissioning for terrestrial and aquatic restoration on the Clackamas and Zigzag Ranger Districts. In addition, site-specific projects include some road management decisions, as appropriate. Such projects include North Fork Mill Creek Restoration Opportunities on the Hood River Ranger District and 2007 Plantation Thinning on the Clackamas River Ranger District.

Since all of the decisions have or will be made through the NEPA process, designating these decisions comply with the criteria for designating roads, trails and areas as outlined in Final Travel Management Rule in Subpart B, §212.55 (a) through (e) (page 68289-68290).

Motor Vehicle Use for Dispersed Camping

The Final Travel Management Rule, Subpart B, §212.51(b) states: "In designating routes, the responsible official may include in the designation the limited use of motor vehicles within a specified distance of certain designated routes, and if appropriate within specified time periods, solely for the purposes of dispersed camping . . ." (page 68289). The responsible official will designate on the MVUM all existing motor vehicle access to dispersed camping based on the analysis and decision made in the Mt. Hood Land and Resource Management Plan [Forest Plan], and corresponding Record of Decision (1990). As such, no changes will be made at this time to motor vehicle access to dispersed camping.

The existing use of road corridors for motor vehicle access to dispersed camping will be designated on the MVUM. Motor vehicle access for dispersed camping will not be allowed in areas where motor vehicle travel is prohibited in the Forest Plan and in areas prohibited by existing Forest Orders. For example, no motor vehicle access to dispersed camping will be permitted in designated wilderness areas, unroaded recreation areas, inventoried roadless areas, municipal watersheds, or wild and scenic river corridors. Motor vehicle access to dispersed camping will be restricted to licensed vehicles only; OHV use will be prohibited. Also, motor vehicle access to dispersed camping only will be permitted from National Forest System roads; motor vehicle access to dispersed camping will not be permitted from user-created roads or trails, old skid trails, or any other road that is not designated as an official National Forest System road.

Since the Forest Plan was completed through the NEPA process, this decision complies with the criteria for designating roads, trails and areas as outlined in Final Travel Management Rule in Subpart B, §212.55 (a) through (e) (page 68289-68290).

Motor Vehicle Use for Game Retrieval

The Final Travel Management Rule, Subpart B, §212.51(b) states: "In designating routes, the responsible official may include in the designation the limited use of motor vehicles within a specified distance of certain designated routes, and if appropriate within specified time periods, solely for the purposes of . . . retrieval of a downed big game animal by an individual who has legally taken that animal" (page 68289). The Regional Forester has reserved the authority for decisions to designate the use of motor vehicles, including OHVs, within a specific distance of designated routes for the purposes of big game retrieval (R6 Guidelines, 9/6/2006). To date, no off-road motor vehicle travel to retrieve big game has been authorized by the Regional Forester.

Use by Over-snow Vehicles

The Final Travel Management Rule, Subpart C, §212.80 provides regulations for the use of over-snow vehicles, including establishing restrictions and prohibitions (page 68290). At this time, there are no proposed changes to the management of over-snow vehicles on the Forest. Over-snow vehicles trails have been previously analyzed and designated on a map provided to the public by the Forest each year.

For the reasons stated above, this project does not include roads management, motorized access to dispersed camping, large game retrieval or over-snow vehicles. This project does not include changes to the motorized access for dispersed camping, large game retrieval, or access for over-snow vehicles. Also, this project does not change access by licensed motor vehicles, except indirectly where existing roads would be decommissioned or converted to motorized trails for OHVs. Previous designations and prohibitions regarding motor vehicle access in the Mt. Hood National Forest, including those related to licensed motor vehicles, over-snow vehicles, motorized access to dispersed camping and seasonal road closures that are not explicitly changed or modified by this project will remain in place and will be designated on the MVUM until changed by future analysis and NEPA decisions. After this project is implemented, the Forest will be in full compliance of the Final Travel Management Rule for all motor vehicles.

1.4. Purpose of and Need for Action

The purpose of this project is to designate roads, trails and areas for OHV use by class of OHV and time of year. By meeting this purpose, OHV use on the Forest would comply with 36 CFR Parts 212, 251, 261, and 295 – Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule [Federal Register Vol. 70, No. 216 (2005)]. The Final Rule states that the US 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 will enhance public enjoyment of National Forests while maintaining other important values and uses of NFS [National Forest Systems] lands" (page 68265).

In order for OHV use on the Forest to comply with the Final Travel Management Rule, there is the underlying need for:

- Designating and/or constructing OHV roads, trails, and areas (as appropriate) on Mt. Hood National Forest to provide recreation opportunities;

- Changing the current management direction in the Mt. Hood Land and Resource Management Plan to comply with the Final Travel Management Rule by designating roads, trails, and areas; and,

- Balancing recreation opportunities for OHV use with other recreational uses of the National Forest and natural resources as directed by the Mt. Hood National Forest Land and Resource Management Plan.

Desired Future Condition

More than four million people visit the Forest each year, many of whom come from the Portland/Vancouver metropolitan area only 20 miles west of the Forest. Since the Forest provides wildland recreation to an urban population, the Forest's recreational niche is strongly influenced by its local, urban visitors; and therefore, strives to provide *diverse* recreation opportunities (US Forest Service 2006). Currently, there are substantial OHV recreation opportunities on established roads and trails (as well as off-road opportunities) in the vast, undeveloped forest area outside of wilderness, major highway corridors and significant rivers and lakes.

In 2007, the Forest (with public input) developed a recreation niche statement that characterizes the distinct role the Forest plays in providing outdoor recreation opportunities, experiences, and benefits. The niche allows managers to focus management efforts on what is unique and valuable about the Forest. The niche is, in part, determined by public expectations (demand) and by the ecological land base. Public participants described and mapped their preferred recreation activities and where they recreate. The niche statement follows:

> ***A Mountain of Possibilities*** *- Mt. Hood is an Oregon icon, exemplifying the connection between community and place. With its many historic and cultural threads, the mountain is woven into the economic and social fabric of people and communities in and around the Forest. Through collaboration, Mt. Hood National Forest staff fosters citizen stewards who contribute their talents toward the betterment of the forest or who share their outdoor skills with others. Sustainable partnerships increase the Forest's contribution to quality of life and sense of place. More than four million people come to the Forest each year for play, exercise, learning, connection to nature, and spiritual renewal. Visitors appreciate the variety of year around, easily-accessible recreation activities; many consider it their "back yard." They value the landscape tapestry that provides great trails and opportunities for solitude. Others may only see the mountain from afar, but their lives are enriched by its intrinsic values (US Forest Service 2006).*

Based on the public's input and NVUM data (see Section 3.1.1.), the Forest concluded that the area currently available for OHV recreation is disproportionate to current use and need. This disparity is compounded by the documented incompatibility of OHV and "quiet" recreation uses (Moore 1994). Therefore, the Forest's recreation niche, encapsulated above, captures the Forest's desire to offer only a moderate opportunity for OHV recreation in the future. The Forest is not striving to be known as a major provider of OHV recreation, or major OHV destination, even for the Portland/Vancouver Metropolitan area.

Achieving the desired balance between OHV opportunities and other recreation pursuits will be a delicate balancing act. To successfully protect lands and resources, while providing opportunities for the safe use and enjoyment of OHVs on designated roads, trails and areas, the Forest must manage OHV use in partnership with other government agencies, communities, and interest groups. Offering too few OHV route systems, or routes of inferior challenge and quality, could jeopardize the trust relationship that the Forest needs to earn and maintain with OHV interests. Offering route systems that rival or exceed (in length or level of challenge) those offered by the State's premier OHV destinations (for example, the Tillamook State Forest OHV Area or East Fort Rock); however, would not be consistent with the Forest's desired future condition. Therefore, the proposed action and the action alternatives were each designed using the following goals: (1) to provide a set of connected OHV routes, each robust enough to interest and challenge beginning and intermediate OHV users; (2) to not exceed the challenge offered by better-known OHV destinations available to the Portland/Vancouver OHV community; and, (3) to dedicate a majority of the Forest to "quiet" recreation pursuits.

1.5. Proposed Action (Alternative 2)

The Proposed Action (Alternative 2) designates OHV roads and trails, and one small OHV area (approximately four acres) within six proposed OHV locations (Appendix A, Map: Alternative 2 OHV Proposal Overview) listed below. After the Record of Decision is signed for this project, the Final Travel Management Rule would require all OHVs to remain on these designated routes and area, and no OHV cross-country travel[2] would be permitted.

- McCubbins Gulch, Barlow Ranger District
- Rock Creek, Barlow Ranger District
- Gibson Prairie, Hood River Ranger District
- Bear Creek, Hood River Ranger District
- Peavine, Clackamas Ranger District
- LaDee Flats, Clackamas Ranger District

All National Forest System roads and trails were considered for OHV access by the Forest Service and members of the public during a two-year long dialogue with the public. The six locations that resulted from this dialogue provide a balance between providing recreational opportunities and protecting natural resources as required by the Final Travel Management Rule. Within each location, specific OHV roads, trails and areas are proposed by OHV class, and new trails are proposed for construction where they would create trail loop opportunities.

The Proposed Action includes the following features:

- Some roads identified in the Mt. Hood National Forest Roads Analysis (2003) as decision roads (i.e., not needed for management purposes) would be converted to OHV trails and removed from the road system.
- New OHV trails would be constructed to connect existing roads and trails and to provide loop opportunities.
- Approximately 13 miles of decision roads would be decommissioned (i.e., closed and removed from the Forest's transportation system). These roads would be decommissioned because designating nearby routes would cause these roads to become a law enforcement or natural resource problem.
- Mixed-use routes would be proposed in each location. Mixed-use routes allow OHVs and licensed motor vehicles to use the same routes.
- Classes of OHVs allowed would be designated for all routes.
- A day-use area within the Rock Creek OHV location would have restrictions on camp fires and overnight dispersed camping.

2 OHV cross-country travel is defined as an OHV leaving the designated road, trail or area.

- A staging area would be identified within each of the six proposed OHV locations. The staging area would be a day-use area that serves as a trailhead for motorized recreation. McCubbins Gulch Campground would continue to be the staging area for this OHV system.
- Project design criteria (PDC), including seasonal restrictions for some of the OHV routes and areas, would reduce or eliminate potential impacts.

The following table summarizes the allowable OHV use under the Proposed Action.

Table 1-1. Allowable OHV use under the Proposed Action.

Location	Class of OHV*	Trails (miles)		Roads (miles)		Total Miles by Area
		Existing Trails	New Construction	Convert to Trail	Mixed-Use	
Bear Creek	Class III	0.0	39.1	0.0	0.0	**39.1**
Gibson Prairie	Class I	4.0	4.3	1.8	5.1	**15.2**
LaDee Flats	Class I, II and III	0.0	0.4	5.4	19.1	**38.9**
	Class I and III	0.0	1.2	4.5	0.0	
	Class II	0.0	0.0	0.0	8.3	
McCubbins Gulch	Class I and III	32.0	0.0	4.7	8.8	**50.6**
	Class III	0.0	5.1	0.0	0.0	
Peavine	Class I, II and III	0.0	3.0	19.6	15.2	**37.8**
Rock Creek	Class I and III	2.1	6.2	14.6	16.7	**39.6**
Total Miles		**38.1**	**59.3**	**50.6**	**73.2**	**221.2**

*Class I OHV (Quads, 3-wheelers): OHVs 50 inches wide or less; dry weight of 800 pounds or less; has a saddle or seat; and travels on three or more tires.
Class II OHV (Jeeps, Sand rails, SUVs, etc.): OHVs wider than 50 inches; and dry weight more than 800 pounds.
Class III OHV (motorcycles): OHVs on two tires; and dry weight less than 800 pounds.

Also, a small OHV area is proposed in the LaDee Flats location. The area is located at the North Fork Quarry (approximately four acres) located on Road 4610-120. The legal description is T4S, R6E, Section 19, NE ¼, SE ¼.

The project would be implemented using a combination of appropriated funding, grant funding (i.e., Oregon Parks and Recreation ATV Grant Program), and volunteer and partnership in-kind support. Currently, the Oregon Parks and Recreation ATV Grant Program helps pay for operation and maintenance, law enforcement, emergency services, land acquisition, leases, planning, development and safety education in Oregon's OHV recreation areas. No new construction would be completed until funding is secured. Funding for new trail construction would come from one of the three sources listed above.

A Forest Plan Amendment would be required to bring the Mt. Hood National Forest Land and Resource Management Plan (Forest Plan) into consistency with the Final Travel Management Rule. To achieve this, the amendment would limit OHV use to designated roads, trails and areas; prohibit cross-country travel by OHVs; close existing off-road areas; and remove the requirement to post areas or roads as closed to OHV use. This would include amending the following standards in the following land use allocations: A3-Research Natural Areas, A4-Special Interest Area, A7-Special Old Growth, A9-Key Site Riparian, B1-Wild, Scenic and Recreational Rivers, B3-Roaded Recreation, B5-Pileated Woodpecker/Pine Martin Habitat Area, B6-Special Emphasis Watershed, B11-Deer and Elk Winter Range, and C1-Timber Emphasis.

1.6. Management Direction

This EIS process and documentation have been completed according to direction provided in the National Forest Management Act (NFMA), National Environmental Policy Act (NEPA), Council on Environmental Quality regulations, Clean Water Act, Clean Air Act, and Endangered Species Act. In addition, the EIS process and documentation have been completed according to direction provided in the Wilderness Act, including the Omnibus Public Land Management Act of 2009 (H. R. 146). All newly designated wilderness areas prohibit OHV use, and the

Huxley Ridge trail will no longer be open for OHV use. Similar to the existing wilderness areas, “buffers” from other management activities on adjacent lands are not required for newly designated wilderness areas [H.R. 146 Section 1202(f)(1)].

The EIS is tiered to the Mt. Hood National Forest Land and Resource Management Plan Final Environmental Impact Statement (US Forest Service 1990a) and Record of Decision (US Forest Service 1990c) as well as the Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (US Forest Service and USDI BLM, 1994) (also called the Northwest Forest Plan). This EIS also incorporates by reference the accompanying Land and Resource Management Plan (US Forest Service 1990b) (also called the Forest Plan), as amended by the Northwest Forest Plan. The Forest Plan guides all natural resource management activities and establishes management standards and guidelines for the Forest. It describes resource management practices, levels of resource production and management, and the availability and suitability of lands for resource management. The Northwest Forest Plan identifies land allocations and management direction to respond to the underlying needs of managing substantial parts of these forests for late-successional and old-growth conditions, for a predictable and long-term supply of timber. The project is consistent with all applicable Federal, state and local laws.

Current management direction for travel management, including OHV travel, on the Forest is provided by the Forest Plan Access and Travel Management Guide, Mt. Hood National Forest Roads Analysis, Executive Orders 11644 and 11989, Final Travel Management Rule (Federal Register, Vol. 70, pgs. 68264-68291), State of Oregon OHV Classifications, and Forest Orders (prohibitions pursuant to 36 CFR part 261). More specific information for each type of management direction is provided in the following sections. State of Oregon traffic laws for licensed and unlicensed vehicles apply to traffic on Forest Service roads.

Mt. Hood National Forest Roads Policies

The Forest Plan Access and Travel Management Guide (Appendix C of Forest Plan) provides broad direction for travel management of vehicles used for recreation specific to each management area and identified by vehicle type and provides general Forest guidelines for preparation and implementation of travel management plans for the purpose of assigning specific access management goals and objective to individual routes, trails and land areas. This management direction was designed to comply with Forest Service Manual 2355 to provide a diversity of off-road vehicle recreation opportunities when:

- The use is compatible with established land and resource objectives;
- The use is consistent with the capability and suitability of the resources;
- The type of off-road vehicle opportunity is an appropriate National Forest recreational activity; and,
- There is demonstrated demand which cannot be satisfied elsewhere.

OHV use was determined for roads, trails, and cross-country areas for each management area (see Appendix B).

In January 2001, the Forest Service issued interim administrative directives requiring that all road management activities, including construction, reconstruction, or obliteration, must be preceded by a roads analysis that identifies the need for a road and emphasizes a minimum road system. The Mt. Hood National Forest Roads Analysis (US Forest Service 2003) addresses both the access benefits and ecological costs of road-associated effects, gives priority to reconstructing and maintaining needed roads and decommissioning unneeded roads, or, where appropriate, converting them to less costly and more environmentally beneficial other uses. This process is outlined in Forest Service Manual 7700. Responsible officials are directed to use a Roads Analysis process to ensure that road management decisions are based on identification and consideration of social and ecological effects. The objective is to manage the Forest transportation system to provide user safety, convenience, and efficiency of operations in an environmentally responsible manner and to achieve road related ecosystem restoration within the limits of current or likely funding levels. This EIS incorporates by reference the Roads Analysis.

Forest Service National Travel Management Regulations

The issue of increasing OHV use on public lands, and its associated resource impact concerns and public conflicts, has existed since the issuance of Executive Order 11644 in 1972 (Federal Register, Vol. 37, pg 2877), as amended by Executive Order 11989 in 1977 (42 Federal Register, Vol. 42, pg 26959). The Executive Order states: “The widespread use of such vehicles on the public lands – often for legitimate purposes but also in frequent conflict with wise land and resource management practices, environmental values, and other types of recreation activity – has demonstrated the need for a unified Federal policy toward the use of such vehicles on the public lands." The purpose of this Executive Order was "to establish policies and provide for procedures that will ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands."

Former Chief of the Forest Service, Dale Bosworth, also recognized unmanaged recreation, especially OHV use, as one of "Four Key Threats Facing the Nation's Forest and Grasslands" (US Forest Service June 2004). This recognition, as well as past intentions to better manage motor vehicle use on public land, led to the development of the Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule (Final Travel Management Rule) that was released by the US Forest Service on November 9, 2005 (Federal Register, Vol. 70, pgs. 68264-68291). The new travel management rule revised regulations 36 CFR parts 212, 251, 261, and 295 to require designation of roads, trails, and areas for motor vehicle use on all national forests. The Final Rule provides a consistent framework for administrative units (i.e., national forests) to designate roads, trails, and areas open to motor vehicle use, by class of OHV, and if appropriate, by time of year. The purpose of the rule is to "provide for a system of National Forest System roads, National Forest System trails, and areas on National Forest System lands that are designated for motor vehicle use. After these roads, trails, and areas are designated, including the class of OHV and time of year, motor vehicle use not in accordance with these designations is prohibited by 36 CFR 261.12. Motor vehicle use off designated roads and trials and outside designated areas is prohibited by 26 CFR 261.13" (70 FR 62289). The rule directed that designated routes will be identified on a Motor Vehicle Use Map (MVUM). According to direction in the Forest Service Manual (FSM 7711.3.5), the MVUM will display roads and trails according to the following seven categories to identify permitted motor vehicle classes:

1. *Roads Open to Highway Legal Motor Vehicles Only*. These roads are open only to motor vehicles licensed under state law for general operation on all public roads within the state.

2. *Roads Open to All Motor Vehicles*. These roads are open to all motor vehicles, including smaller off-highway vehicles that may not be licensed for highway use, but not vehicles that are oversized or overweight under state traffic law.

3. *Trails Open to All Motor Vehicles, including both highway-legal and non-highway-legal vehicles*.

4. *Trails Open to Motor Vehicles 50 inches or Less in Width*.

5. *Trails Open to Wheeled Motor Vehicles 50 Inches or Less in Width*.

6. *Trails Open to Motorcycles Only*. Sidecars are not permitted.

7. *Special Vehicle Designation*. This category includes any classes of vehicles that are not listed in the categories other six categories listed above.

The Final Rule provides a framework for decisions which will improve opportunities for sustainable motorized recreation, better protection of the environment, increased public safety, and ample high-quality access to National Forest System lands.

State of Oregon OHV Classifications

The State of Oregon considers all vehicles intended for off-highway use to be all-terrain vehicles (ATVs). ATVs are broken into three classes and defined as follows:

Class I ATV (quads, 3-wheelers)
- Vehicles 50-inches 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 State of Oregon defines an off-highway vehicle (OHV) as a "term used to describe all vehicles designed for off-highway travel and classified as one of the three classes of ATVs in Oregon." The State regulates and licenses vehicles. Because the recreating public is most familiar with State OHV classes, this EIS uses State terminology to describe the permitted vehicles. To implement a decision resulting from this analysis; however, the State classes and combinations of classes must be translated into the appropriate MVUM categories. Table 1-2 provides a crosswalk between the two terminologies.

Table 1-2. Comparison of combinations of State OHV Classes identified in the Proposed Action and alternatives to the Proposed Action with Motor Vehicle Use Map (MVUM) motor vehicle categories required by the Forest Service Manual (FSM 7711.3.5).

Travelway	State OHV Class Combination Analyzed	Corresponding MVUM Motor Vehicle Class Category
Road	Class I only	Special Vehicle Designation
Road	Class II only	Special Vehicle Designation
Road	Class III only	Special Vehicle Designation
Road	Class I and III only	Special Vehicle Designation
Road	Class I, II and III	Roads Open to All Motor Vehicles
Trail	Class I only	Special Vehicle Designation
Trail	Class III only	Trails Open to Motorcycles Only
Trail	Class I and III only	Trails Open to Wheeled Motor Vehicles 50 Inches or Less in Width
Trail	Class I, II and III	Trails Open to All Motor Vehicles, including both highway-legal and non-highway legal vehicles.

Mt. Hood National Forest – Forest Orders

The Forest has closed specific roads, trails, and areas to motor vehicle travel, including OHV trail, using Forest Orders. According to 36 CFR 261.50, a Forest Order may close an area to entry or may restrict the use of an area by applying any or all of the prohibitions authorized, including closing or restricting the use of National Forest System roads or trails. Table 1-3 includes a complete list of Forest Orders applicable to OHV use on the Forest, as of January 2009. Based on current regulations, the following areas are closed to off-road travel: Old Maid Flat, Clear Lake, Camas Prairie (March 1 to August 1), Ramsey Creek Parcel, Gibson Prairie, Gordon Creek Watershed, La Dee Flat, Summit Meadow, Bull Run Watershed, and The Dalles Watershed. OHV use is prohibited on some gravel and native surface roads, including the Barlow Road #3530. It is prohibited to operate any vehicle off National Forest System, State or County roads in a manner that damages or unreasonably disturbs the land, wildlife or vegetative resources. Forest Orders may be updated or changed at any time; a current list of Forest Orders is available at: http://www.fs.fed.us/r6/mthood/leo/forest-orders/.

A decision to implement Alternative 2 (Proposed Action), Alternative 3 or Alternative 4 would replace the management direction provided in the Forest Plan Access and Travel Management Guide (Appendix C of Forest Plan) as well as any previous NEPA decisions allowing cross-country travel. Any NEPA decision prohibiting cross-country travel would remain in place, unless specifically identified in the alternatives discussion contained in Chapter 2. Forest Orders would be amended and adjusted as necessary in the implementation phase.

Table 1-3. Complete list of Forest Orders (as of January 2009) for the Forest.

Order Number	Date	Prohibitions	Location	District	CFR Regulations
MH-115-01-89	1/15/1986	Using any motorized wheeled vehicle	Flag Point Road 2730-200, Mile Post 3.06 to 3.32	Barlow	36 CFR 231.54(a)
MH-239-01-95	5/3/1995	Motor vehicle on Eight mile Interpretive Trail.	150 yards of trail between Eightmile & Lower Crossing Campgrounds.	Barlow	36 CFR 261.55 (b)
MH-256-03-98	3/20/1998	Possess, use vehicle off Forest developed roads	LaDee Flats Area, National Forest System lands in Sections 17, 20, 21, 22, 23, 25, 26, 27, 28, 35, and 36 or T4S, R5E.	Clackamas	36 CFR 261.54(a)
MH-263-01-99	5/6/1999	Possession or use of vehicle off Forest developed roads	Camas Prairie	Barlow	36 CFR 261.56
MH-275-09-01	1/5/2001	1) Using a motor vehicle on Forest Roads, except road 15; 2) Using a motor vehicle on Forest development trail; 3) Possess or use a motor vehicle off-road	Gordon Creek Watershed	Zigzag	36 CFR 261.54(a); 261.55 (b), 261-56
MH-278-06-01	8/24/2001	1) Using a motor vehicle on Forest Roads; 2) Possess or us a motor vehicle off-road	Clear Lake	Hood River	36 CFR 261.54(a), 261.56
MH-282-09-02	1/31/2003	Possess or use a motor vehicle off Road	Summit Meadow, between Roads 2656 & 2650	Zigzag	36 CFR 261.56
MH-295-09-04	1/22/2004	Possession or use of a vehicle off Forest roads	Old Maid Flat	Zigzag	36 CFR 261.56
MH-2003-2	5/2008	Being on any road with a motorized vehicle where entry is restricted by a sign, closed or locked gate, barrier, barricade or berm, except snowmobiles and Class I All Terrain Vehicles on designated over-snow routes.	Forestwide (this includes Ramsey Creek Parcel, Gibson Prairie, The Dalles Watershed, and Bull Run Watershed)	Forestwide	36 CFR 261.54(e)

Land Use Allocations

The proposed OHV routes and one area for Alternatives 2, 3, and 4 are located in the following Forest Plan Management Areas. The goals for each management area are provided below. Specific mileage within each management area is provided in the alternative discussion in Chapter 2. No management area is "buffered" from use on the adjacent lands.

A1 – Wild, Scenic and Recreational Rivers – White River
Goal: The ultimate goal . . . is to protect and enhance the resource values for which the White River was designated into the Wild and Scenic River system.

A3 – Research Natural Area
Goal: Preserve examples of natural ecosystem in an unmodified condition for research and education and to provide areas to serve as a baseline against which human impacts on natural systems can be measured.

A4 – Special Interest Area
Goal: Protect and where appropriate, foster public recreational use and enjoyment of important historic, cultural, and natural aspects of our national heritage. Preserve and provide interpretation of unique geological, biological, and cultural areas for education, scientific, and public enjoyment purposes.

A6 – Semi-Primitive Roaded Recreation
Goal: Provide a variety of year-round dispersed motorized opportunities and opportunities for semi-primitive recreational experiences.

A7 – Special Old Growth
Goal: Provide the many significant values of old growth forests for present and future generations. Maintain old growth to provide for wildlife and plant habitat, ecosystem diversity, preservation of aesthetic qualities, and to provide opportunities for a high degree of interaction between people and forests with old growth character.

A9 – Key Site Riparian Area
Goal: Maintain or enhance habitat and hydrologic conditions of selected riparian areas, notable for their exceptional diversity, high natural quality and key role in providing for the continued production of riparian dependent resource values.

B2 – Scenic Viewshed
Goal: Provide attractive, visually appealing forest scenery with a wide variety of natural appearing landscape features. Utilize vegetation management activities to create and maintain a long-term desired landscape character.

B3 – Roaded Recreation
Goal: Provide a variety of year-round recreation opportunities in natural appearing roaded settings. A secondary goal is to maintain a healthy forest condition through a variety of timber management practices.

B4 – Pine/Oak (Wildlife Emphasis)
Goal: Maintain key deer and elk winter habitat with additional emphasis on nesting and forage production for year-round turkey and squirrel habitat. Secondary goals are to maintain a healthy forest condition through a variety of timber management practices and to provide summer dispersed and developed recreational opportunities.

B6 – Special Emphasis Watershed
Goal: Maintain or improve watershed, riparian and aquatic habitat conditions and water quality for municipal uses and/or long-term fish production. A secondary goal is to maintain a healthy forest condition through a variety of timber management practices.

B8 – Earthflow Area
Goal: Maintain hydrologic and physical balances to prevent reactivation or acceleration of large, slow moving earthflow areas. Allow for the management and utilization of forest resources through the use of special management practices.

B10 – Deer and Elk Winter Range
Goal: Provide high quality deer and elk habitat for use during most winters. Provide for stable populations of mule deer and Rocky Mountain elk on the eastside and black-tailed deer and Roosevelt Elk on the westside of the Cascades. Secondary goals are to maintain a healthy forest condition through a variety of timber management practices and to provide dispersed summer and developed recreation opportunities.

B11 – Deer and Elk Summer Range
Goal: Provide high quality summer rearing habitat for deer and elk. A secondary goal is to maintain a healthy Forest condition through a variety of timber management practices.

B12 – Backcountry Lake Area
Goal: Protect or enhance the recreation, fish and wildlife, or scenic values of designated lakes. A secondary goal is to maintain a healthy forest condition through a variety of timber management practices.

C1 – Wood Product Emphasis
Goal: Provide lumber, wood fiber, and other forest products on a fully regulated basis, based on the capability and suitability of the land. A secondary goal is to enhance other resource uses and values that are compatible with timber production.

The proposed OHV systems for Alternatives 2, 3, and 4 are located in the following Northwest Forest Plan Land Allocations. Specific mileage and maps within each land use allocation are provided in the alternative discussion in Chapter 2. No land allocation is "buffered" from use on the adjacent lands.

Tier 1 Key Watershed
Some of the project area is located within Tier 1 Key Watershed – a component of the Aquatic Conservation Strategy (USDA & USDI 1994). These watersheds were designated as sources for high water quality; they contain at-risk anadromous fish (e.g., salmon) and bull trout. The following subwatersheds include designated OHV routes: White River, West Fork of Hood River, Mill Creek, Fivemile/Eightmile Creek, and Roaring River. Watershed analyses in all of these subwatersheds have been completed: White River Watershed Analysis (1994), West Fork of Hood River Watershed Analysis (1996e), Mill Creek Watershed Analysis (2000), Mile Creeks Watershed Analysis (1994), and Roaring River Watershed Analysis (1996d).

Riparian Reserve
This land allocation includes areas along rivers, streams, wetlands, ponds, lakes, and unstable or potentially unstable areas where the conservation of aquatic and riparian-dependent terrestrial resources receives primary emphasis. Riparian Reserve standards and guidelines apply and are added to the standards and guidelines of other designations

Matrix
This land allocation management area consists of Forest Service lands outside of designated areas (i.e., Congressionally Reserved Areas, Late-Successional Reserves, Adaptive Management Areas, Administratively Withdrawn Areas, and Riparian Reserves). Most timber harvest and other silvicultural activities are conducted in portions of matrix with suitable forest lands. Each of the subwatersheds proposed contain portions within matrix lands.

Late Successional Reserve (LSR)
LSRs are designed to maintain a functional, interactive, and late-successional and old-growth forest ecosystem, in combination with the other land allocations and standards and guidelines of the 1994 amendment. The different LSRs serve as habitat for late-successional and old-growth related species, which includes the northern spotted owl. The following LSRs include proposed OHV routes: North Willamette LSR (1997b) and Surveyor's Ridge LSR (1998).

1.7. Management Standards and Guidelines

All of the applicable standards and guidelines from the Forest Plan and Northwest Forest Plan that pertain to this project are contained in Appendix D. These standards and guidelines cover all resource areas analyzed in this EIS. In addition, all watershed assessments prepared using the Northwest Forest Plan were reviewed and found to be consistent with the Proposed Action and alternatives.

There are 20 standards and guidelines in the Forest Plan (Table 1-4) that currently allow cross-country travel by OHV or require signing to enforce a trail, road or area closed to OHV travel. Also, the Forest Plan includes monitoring requirements for Off-Road Vehicles (page 5-69). In addition, the existing situation and historic use of some trails and roads are inconsistent with the seven standard and guidelines in the Forest Plan found in Table 1-5. Although this Forest Plan amendment would allow OHV use on the designated roads and trails within these management areas, new trail construction would be prohibited within the Research Natural Areas (A3), Special Interest Areas (A4), Key Site Riparian (A9), Specialist Old Growth (A7), and Special Emphasis Watershed (B6) management areas.

Table 1-4. Forest Plan Standards and Guidelines discussing off-road vehicle (ORV) travel included in the proposed Forest Plan Amendment for all Alternatives.

Standard	Page	Standard and GUIDELINE[1]
FW-413 Transportation	4-95	Roads, areas and trails closed or restricted to recreational access shall be posted.
FW-447 Transportation	4-97	ORV trails should not incorporate open roads as part of the trail system.
FW-459 Dispersed Recreation	4-98	ORV trails should not incorporate open roads as part of the trail system.
FW-465 Dispersed Recreation	4-99	Opportunities for ORV use should be available except where not allowed by management direction, and where determined to adversely impact land capability and resource values.
FW-483 Wild & Scenic Rivers	4-102	Areas, roads and segments of rivers closed to vehicle use shall be posted.
FW-543 Wild & Scenic Rivers	4-106	Areas, roads and segments of rivers closed to vehicle use shall be posted
A3-006, A3-007 Research Natural Areas	4-147	ORV and non-motorized bicycle use shall be prohibited. RNAs shall be posted as closed to ORV and non-motorized bicycle use.
A4-038 Special Interest Area	4-156	Recreational off-road vehicle use shall be prohibited except as noted in items 4 [A4-039] and 5 [A4-040], below.
B1-077, B1-078, B1-079 Wild, Scenic and Recreational Rivers	4-216	Within scenic and recreational river corridors, motorized use shall be limited. 1) Motorized vehicles shall be permitted only on open roads. 2) ORV may occur only on designated trails.
B1-082, B1-083 Wild, Scenic and Recreational Rivers	4-216	Areas, roads and segments of rivers closed to vehicle use shall be posted. Administrative use of motorized vehicles shall be allowed in all river segments.
B3-038 Roaded Recreation	4-232	Off-road vehicle use shall be encouraged on designated trails and/or areas.
B5-001, B5-002 Pileated Woodpecker / Pine Marten Habitat Area	4-242	Off-road motorized vehicle use should not be permitted except on designated trails. All areas and rails closed to off-road vehicle use shall be posted.
B11-037 Deer and Elk Summer Range	4-280	Recreational motorized vehicle activity shall not be permitted except on open roads and designated parking areas.
C1-041, C2-041 Timber Emphasis	4-294	Off-road vehicle (ORV) use should be encouraged. ORV use should be restricted within specific areas with conflicting resource objectives.
Monitoring Element: Off-Road Vehicle (ORV) Use	5-69	• Are high quality ORV opportunities provided in areas which are suitable for ORV use and the needs, skills, and interests of users? • Are the ORV opportunities provided effective in minimizing conflicts between user groups and safe for users and the general public? • Are ORV opportunities being located, designated, and managed to minimize the negative effects (within acceptable limits) on key fish and wildlife species and sensitive habitats?

1 Shall is defined as: "Action is mandatory!" Should is defined as: "Action is required; however, case by case exceptions are acceptable if identified during interdisciplinary project planning environmental analyses. Exceptions are to documents in environmental analysis (National Environmental Policy Act 1969) public documents." [Page Four – 45, Forest Plan].

Table 1-5. Forest Plan Standards and Guidelines discussing off-road vehicle (ORV) travel included in proposed Forest Plan Amendment for Alternatives 2 and 3. All standards are included in the proposed Forest Plan Amendment for Alternative 2. The proposed Forest Plan Amendment for Alternative 3 does not include the Standards and Guidelines shaded in gray. None of these Standards and Guidelines would be included in Alternative 4.

Standard	Page	Standard and GUIDELINE
A3-040 Research Natural Areas	4-149	All forms of off-road vehicle use shall be prohibited.
A4-039 Special Interest Area	4-156	Off-road vehicle uses in powerline rights-of-way should be allowed where consistent with other management direction, e.g. riparian and cultural resources protection.
A7-024 Special Old Growth	4-172	Recreation off-road vehicle use should be prohibited.
A9-039 Key Site Riparian	4-184	Recreation off-road vehicle use, except over-snow vehicles, shall be prohibited.
B6-036, B6-037 Special Emphasis Watershed	4-251	Recreational off-road vehicle use (other than over-snow) shall be discouraged. Recreational off-road vehicle use shall be prohibited in Still Creek and The Dalles Watershed Management Unit.

A Forest Plan amendment of the standards and guidelines presented in Tables 1-4 and 1-5 are proposed for Alternative 2 (Proposed Action) to comply with the Final Travel Management Rule. The proposed Forest Plan Amendment for Alternative 3 would include all standards and guidelines in Tables 1-4 and 1-5, except A3-006, A3-007, A7-024, B6-036, and B6-037 (shaded gray in Table 1-5). The proposed Forest Plan Amendment for Alternative 4 would include all standards and guidelines in Table 1-4; no standards and guidelines from Table 1-5 would be included. Specific language for the Forest Plan Amendment is discussed by alternative in Chapter 2.

1.8. Decision Framework

The Forest Supervisor for the Mt. Hood National Forest is the responsible official for this EIS. Given the purpose and need, the Forest Supervisor will review the Proposed Action, alternatives, environmental consequences, and public comments in order to make the following decisions:

- Would this project be implemented as proposed, as modified by an alternative, or not at all? If the project is implemented, the Forest Supervisor would need to decide the following:
    - ✓ What OHV roads, trails and areas would be designated?
    - ✓ What new roads, trails and areas would be established or constructed on the Forest to provide OHV recreation opportunities?
    - ✓ What class of OHV would be allowed on each designated route?
    - ✓ What time of year will OHVs be allowed to operate on each designated route?
- What PDC and monitoring requirements would the Forest Service apply if this project is implemented?
- What amendments, if any, to the Forest Plan are required to implement this project?

After the decision is made, all routes or areas not designated would be considered unauthorized and OHV use would be illegal based on the Final Travel Management Rule. Also, based on the Final Travel Management Rule, motorized cross-country travel would be prohibited except as specified for the purposes of dispersed camping, emergency fire suppression, search and rescue, law enforcement, military operations, and Forest Service administrative use, including uses authorized by permit such as firewood gathering.

User-created OHV routes that develop after the decision would be considered unauthorized, and would be closed or removed by the Forest Service upon discovery. No public process or NEPA analysis would be necessary to remove such a route.

Factors influencing the selection of an alternative include:

- How well the alternative meets the purpose and need for action;
- Potential effects of designating roads, trails and areas for OHV use to the environment;
- Balancing of recreation opportunities for OHV use with other recreational uses of the National Forest and natural resources as directed by the Mt. Hood National Forest Land and Resource Management Plan; and,
- Resulting route density of OHV routes across the Forest.

1.9. Public Involvement

During the development of the project, the Mt. Hood National Forest Projects & Plans website contained potential OHV routes and requested public comment. The website announcement was posted from July 2005 until September 2008. The announcement included maps of seven potential areas and requested the following.

The Forest has identified a number of areas that have potential for the development of trail systems. Forest personnel are asking for help in proposing trail routes in these areas, identifying concerns, identifying other areas that might be suitable for OHV trails construction, and in generating volunteer support from organizations interested in working on maintenance and monitoring use.

The public dialogue to develop the proposed action included two public workshops held in March 2005. The preliminary proposed action was shared with the public at two open houses held in Sandy, Oregon and Hood River, Oregon on May 30-31, 2007. The information from the open houses was used to begin the NEPA process.

Public involvement has occurred throughout the NEPA process. The project was included in the quarterly Schedule of Proposed Actions distributed by the Forest since November 2006. A Notice of Intent (NOI) requesting public comment was published in the Federal Register on August 27, 2007. Information on the proposal was posted on a project website (http://www.fs.fed.us/r6/mthood/projects/), and provided via direct mailing to approximately 870 individuals, organizations, agencies, businesses, recreational residence owners, and local and tribal governments. The Forest Service received approximately 375 comments through this process.

Due to the complexity of the Proposed Action, additional public involvement steps were taken to solicit public input during the analysis phases. An update letter was mailed to approximately 650 addresses, including all respondents to the scoping letter. Also, meetings were held with governmental agencies and tribal governments to discuss the project in greater detail. Lastly, the proposed action was presented to groups upon request. The presentation was made to Northern Oregon Motorcycle and ATV Club (NOMAC), Sportsman's Park Homeowners Associations, and Columbia Gorge Off-Road Association (CGORA). The presentation was posted on the Forest website as well.

All scoping comments and mailing lists are available in the project file, located in the Mt. Hood National Forest Headquarters Office in Sandy, Oregon.

1.10. Issues

NEPA directs federal agencies to focus analysis and documentation of significant issues related to the Proposed Action. The scoping process resulted in the identification of some potential issues to be addressed in the EIS. An "issue" arises from the relationships between actions (proposed, connected, similar, cumulative) and environmental consequences (physical, biological, cultural, and socioeconomic). In this EIS, issues are defined as points of discussion, debate, or dispute about the environmental effects of the Proposed Action. The issues are divided into three groups: key, resolved, and tracking issues.

In addition, issues outside the scope of this analysis were identified. The Council of Environmental Quality requires the Forest Service to identify and eliminate from detailed study issues that are not significant (40 CFR 1501.7). Issues may be eliminated from further analysis when the issue is outside the scope of the EIS; are already decided by law, regulation, Forest Plan, or other higher level decision; are not clearly relevant to the decision to be made; or are conjectural and not supported by scientific or factual evidence. Issues outside the scope of this project are available in the project file, located in the Mt. Hood National Forest Headquarters Office in Sandy, Oregon.

1.10.1. Key Issues

Key issues are those that are within the scope of the Proposed Action and suggest the need to consider different actions or project design criteria. Key issues as used in this EIS are those that are used to formulate alternatives, affect the design of alternative components, prescribe PDC, or describe environmental effects. Key issues are identified as such due to their geographic distribution, duration of effects, intensity of interest by the public, or resource area conflict. Alternatives 3 and 4 were designed to address the key issues. The Forest Service identified three key issues:

a. Motorized Recreation
b. Non-motorized Recreation
c. Wildlife Disturbance

Brief summaries of each key issue are presented below.

Key Issue 1: Motorized OHV Recreation

Changes to the OHV route designation on the Forest can affect the viability and quality of the OHV system, especially decreasing the miles of motorized trails available. The proposed alternatives vary in how well they provide a meaningful riding experience. Specific concerns expressed include:

- A reduction in OHV routes may result in an insufficient miles of trails to make the OHV experience worthwhile.
- Having multiple-class OHV routes may result in a diminished recreation experience for motorcycles.
- Restricting some routes to a single OHV class may affect mixed OHV groups, such as families and OHV club groups.
- Designating OHV routes with dead-ends may adversely affect the motorized recreation experience.
- Designating OHV routes may not have the capacity to meet the existing or future needs of OHV users.

Indicators for Comparing Alternatives

- Number of proposed OHV systems with adequate[3] miles of motorized trails.
- Miles of OHV routes by difficulty level.
- Miles of proposed routes by OHV class.
- Miles of dead-end routes by proposed OHV system.
- Number of staging areas and parking capacity.

Discussion of the issue can be found in Section 3.1 – Recreation.

3 Adequate OHV systems have more than 40-miles for Class I OHVs; a variable number of miles for Class II OHVs depending on the difficulty; and more than 50-miles for Class III OHVs. Adequacy is explained further in Section 3.1 Recreation.

Key Issue 2: Non-motorized Recreation

Motorized and non-motorized recreationalists have expressed concerns about their potential loss of access and/or loss of opportunities for desired experiences. Proposed new OHV routes may alter the balance between motorized and non-motorized recreation interests and uses. Altering this balance between users may result in an increase in user conflicts. For example, some residents of the Sportsman's Park subdivision raised specific concern about restricting direct OHV access to the proposed Rock Creek OHV system, while other residents of the community expressed their desire for direct OHV access. In addition, changes to OHV route designation on the Forest can affect the quality of non-motorized recreation. A specific concern was that the noise of OHVs may adversely affect quiet recreation use, particularly where it carries into roadless and wilderness areas.

Indicators for Comparing Alternatives

- Miles of non-motorized trail and other locations where sound emitted by OHVs might be detected.
- Acres of designated wilderness where sound emitted by OHVs might be detected.
- Balance between recreation opportunities for OHV use and other recreation uses of the Forest, and protecting natural resources.
- Distance between the proposed Rock Creek OHV system and Sportsman's Park subdivision.

Discussion of the issue can be found in Section 3.1 – Recreation and Section 3.14 – Socioeconomic.
Key Issue 3: Wildlife Disturbance

Designating OHV routes in summer and winter range habitat may affect big game (i.e., deer and elk) migration patterns. Also, the density of proposed OHV roads and trails and the amount and frequency of their use could disturb wildlife (including old-growth dependent species) during critical life stages, compromise security, and/or affect habitat.

Indicators for Comparing Alternatives

- Miles of OHV trails and roads.
- Miles new trail construction.
- Acres of OHV open to cross-country travel.
- Effects to big game use in each proposed OHV system.

Discussion of the issue can be found in Section 3.5 – Wildlife.

1.10.2. Resolved Issues

Resolved issues are issues identified by the public that have been mitigated through the development of PDC. As such, these issues do not have any significant (see 40 CFR 1501.7(a)(3)) impacts or environmental consequences.

Safety

Designating OHV route systems may increase traffic hazards on roads and trails. The public expressed concern that an increase of OHV use on the Forest would threaten public safety, including an increase in accidents within the OHV community as well as between OHV riders, motorized and non-motorized recreationists. Implementing the PDC discussed in Section 2.4, as required by the action alternatives, would reduce the risk of accidents (but not eliminate it). For example, routes should be maintained to provide the appropriate stopping sight distance based on posted speed limit or prevailing speed within the proposed OHV systems (PDC RD-2). Also, all planned road/trail intersections would be located based on site-specific examination for risk (PDC RD-5).

Additional information is available in Section 2.4 – Project Design Criteria and Section 3.11 – Transportation.

Compliance

The public has expressed concern about current law enforcement mechanisms being ineffective. It was expressed that new tools are needed to ensure that OHV riders comply with the change in OHV route designation. The PDC discussed in Section 2.4 include measures that would increase compliance by motorized recreationists, such as:

- Coordinating with County Sheriffs' Offices that currently receive state OHV funding to plan for OHV emphasis patrols (PDC LE-1); and,
- Increasing public awareness of designated OHV routes through field contacts with forest visitors (PDC LE-4).

Additional information is available in Section 2.4 – Project Design Criteria and Section 3.9 – Law Enforcement.

Hazardous Materials

Accidental spills from OHVs may contaminate the Forest. Specifically, there is greatest concern that possible contamination at staging areas and stream crossings would cause an increase in pollutants within the Forest waterways. The PDC discussed in Section 2.4 include measures to minimize hazardous materials from leaching into surface waters. For example, restroom facilities would be provided, as usage warrants, at designated staging areas (RM-7). Also, spoils/fill materials would be disposed of in stable areas away from stream channels (PDC WR-11).

Additional information is available in Section 2.4 –Project Design Criteria and 3.3 – Water Quality.

Heritage Resources

Designating OHV route systems may damage or destroy historic resources. Implementing the PDC, as discussed in Section 2.4, would minimize possible impacts. As part of the planning process, for example, protection measures for specific sites were developed, and travel routes with the potential to adversely affect significant heritage resources were rerouted or realigned away from the resource (PDC HR-2). In addition, any protection measures necessary would be developed in consultation with the Oregon State Historic Preservation Office, appropriate Tribes, and, if necessary, the Advisory Council on Historic Preservation (see Chapter 4 – Consultation and Coordination for more details).

Additional information is available in Section 2.4 – Project Design Criteria and Section 3.8 – Heritage Resources.

1.10.3. Tracking Issues

Tracking issues are those that have been determined to be relevant, but are not used to formulate alternatives. These issues often describe minor or consistent consequences among alternatives considered in detail. These issues usually are addressed through adherence to standards and guidelines, appropriate laws and regulations, or as covered by the PDC. Tracking issues are generally of interest or concern to the public, and are tracked throughout the document.

Local Economies

Motorized recreation may affect local economies in terms of the potential loss of jobs and income currently generated by OHV use on the Forest. Another financial concern expressed by the public was that local emergency services would not be well equipped to handle an increase in calls. Additionally, the Gate Creek ditch company stated that OHV designation adjacent to the ditch would disturb the integrity of the ditch structure and accelerate the delivery of sediment into the ditch, thereby increasing their ditch maintenance costs.

Indicators for Comparing Alternatives

- Effects of OHV use on local jobs and income.
- Effects of OHV use on local emergency services.
- Effects of OHV use adjacent to the irrigation ditch.

Cost of OHV Systems

Based on current budgets, the Forest may have difficulties paying for the implementation of OHV route designations. There may not be sufficient funding to adequately cover the maintenance and building of OHV trails or upkeep of staging areas.

Indicators for Comparing Alternatives

- Costs of road maintenance OHV roads per year.
- Savings on the cost of road maintenance per year.

- Cost of brushing on mixed-use roads. Increase in brushing costs per year.
- Costs of maintaining all OHV trails.

Discussion of this issue can be found in Section 3.14.

Aquatic Resources

OHV route designation may harm aquatic species and their habitat by affecting water quality and sedimentation rates. The public commented that increased OHV use would result in an increase in sediment loading, which could affect a stream's natural hydrologic flow. Additionally, this increase in sediment could impact spawning and rearing habitat for native fish species. It was also expressed that OHV route designation and new trail construction may impact riparian areas.

Indicators for Comparing Alternatives

- Number of OHV routes crossing streams.
- Number of OHV routes crossing fish-bearing streams.
- Miles of OHV trails and roads within 100-feet of water bodies.
- Miles of OHV routes in drinking water source areas.

Discussion of this issue can be found in Section 3.4.

Soils

OHV route designation may result in changes to soil structure, which could affect soil characteristics, such as compaction, nutrient cycling, and susceptibility to erosion. Also, differences in elevation and season could result in differential erosion potential and recovery from disturbance. OHV route designation may result in increased sediment production, thereby affecting hydrologic regimes and drinking water supplies.

Indicators for Comparing Alternatives

- Risk ratings for effects of OHV use on soils.

Discussion of this issue can be found in Section 3.2.

Invasive Species

OHV routes may result in the spread of invasive plant species. OHVs, clothing, and pets could spread invasive plants to other OHV locations and areas throughout the Forest. Hound's tongue, which already exists in McCubbins, could be transported to other locations. Also, new trails could create additional habitat for weeds to exist.

Indicators for Comparing Alternatives

- Effects of OHV use on invasive plants, including the risk of spread and/or new infestations.

Discussion of this issue can be found in Section 3.6.

Native Species

Concentrating OHVs to designated routes could destroy vegetation, including rare and uncommon botanical species. The public commented that OHVs could crush and trample plants, damage germinating seeds, reduce vegetation cover, and/or destroy crucial root systems.

Indicators for Comparing Alternatives

- Effects of OHV use to native plants, including sensitive plans.

Discussion of this issue can be found in Section 3.6.

Chapter 2 - Alternatives, Including the Proposed Action

2.0. Alternatives, Including the Proposed Action

Chapter 2 describes and compares the alternatives considered for OHV road, trail and area designation on the Mt. Hood National Forest (the Forest). A description and map are provided for each. Also, this section presents the alternatives in comparison form, highlighting the differences between each alternative and providing a basis for choice among options for the Responsible Official and the public. The Responsible Official for this project is Forest Supervisor for the Mt. Hood National Forest.

2.1. Alternative Development Process

The interdisciplinary team (IDT), including the Responsible Official, followed the Forest Service Handbook (1909.15) for developing and considering alternatives. Alternatives were developed to meet the purpose and need and to respond to public issues.

Alternative 2, the Proposed Action, was developed over a two year period and included dialogue from a diverse public. The dialogue included two workshops where members of the public helped to identify potential OHV roads, trails and areas across the Forest as well as the opportunity to comment on the preliminary designations on the Forest's website. OHV enthusiasts, environmental organizations, State government offices, and interested individuals all participated in the process. Using this information, recreational specialists across the Forest developed a preliminary proposed action. The preliminary proposed action was passed through three screens. First, resource specialists from each District conducted a preliminary effects analysis to determine if there were any unacceptable environmental effects. Second, a feasibility study was conducted on this preliminary proposed action. The objective of the study was to develop a trail system that "minimally affects resources, that provides opportunities for satisfying recreation experiences, that requires minimal maintenance, and that serves the intended type and level of use" (Higgins 2006). Third, the preliminary proposed action was shared with the public at two open houses. Based on this public collaboration and feasibility study, Alternative 2 was developed and carried forward into the NEPA process for analysis and consideration.

The Forest Service developed four alternatives: No Action (Alternative 1), Proposed Action (Alternative 2), and two other action Alternatives (Alternatives 3 and 4). The No Action (Alternative 1), defined as current OHV management as approved under existing NEPA decisions and Forest Orders, was compared to the underlying need for action. The current OHV policy for the Forest was developed during land management planning in the 1980s. The policy allows OHVs to venture off roads and trails in areas that have not been specifically closed to such use. Additionally, current state law allows OHVs to operate on any road open to the public which is not paved. (For more information on current Oregon State Laws regarding Off-Road Vehicles; Snowmobiles; All-Terrain Vehicles go to: http://www.oregon.gov/OPRD/ATV/links.shtml). Many gravel and native surface roads on the Forest meet these criteria and thus are open to OHV travel. As such, the current management direction does not comply with the Final Travel Management Rule, specifically routes and areas on the Forest are not closed to OHV use unless designated open as directed by this rule. As such, the focus of this EIS is on the designation of OHV roads, trails and areas by class of OHV and time of year across the Forest. The analysis focuses on the designation of OHV roads, trails and areas.

Public and interagency issues centered on motorized recreation, non-motorized recreation, and route density. Motorized recreation considerations include: sufficiency of miles of trails, number of dead end routes, connectivity of routes, and OHV classes allowed. The primary non-motorized recreation issues focused on the balance between multiple recreational uses. Alternatives 3 and 4 vary in the amount of proposed OHV routes across the Forest. Alternative 3 considers all the routes proposed during the public involvement process and provides additional OHV opportunities across the Forest. Alternative 4 considers all the requests to close roads, trails and areas to OHV use across the Forest and reduce the number of locations where OHV use would be designated.

Twenty-five potential Standards and Guidelines in the Forest Plan were identified to be inconsistent with the Final Travel Management Rule or the action alternatives (see Section 1.7 Management Standards and Guidelines). This inconsistency and potential Forest Plan Amendment is analyzed with Alternatives 2 through 4.

Some alternatives that would resolve public concerns were eliminated from detailed study because they do not meet the purpose and need for action. The eliminated alternatives include: Prohibit Off-highway Vehicle Use on the Forest, Designate All Existing "On-the-Ground" Routes, Continued Off-highway Vehicle Use in Specific Areas, Off-highway Vehicle Use on Gravel Roads, and Increased Off-highway Vehicle Use in Hunting Season. The specific areas considered include Black Wolf, Wildcat, Hillock Burn, Oak Grove, Hugh Creek, and Fish Creek. These are discussed in this chapter in Section 2.7.

2.2. Assumptions and Analysis Framework

Illegal OHV use occurs on the Forest, and has caused natural resource damage. The resource damage has led to Forest Order closures in some areas[1]. While recognizing that illegal OHV use occurs on the Forest, the analysis in Chapter 3 does not include illegal use for the following reasons. First, no inventory of user-created roads and trails exists for the Forest to provide a baseline for potential future illegal use. An inventory would require a considerable amount of time and funding since the entire land base would need to be surveyed. Second, numerous possibilities exist for potential future illegal use. Given the number of possibilities, a likely scenario could not be characterized and analyzed for each alternative. Lastly, based on current regulations, it is illegal to operate any vehicle off National Forest System, State or County roads in a manner that damages or unreasonably disturbs the land, wildlife or vegetative resources. The analysis for Alternative 1 does include some anecdotal evidence and field surveys that include illegal use. This analysis however does not capture all illegal use across the Forest. Because of these reasons, the analysis in Chapter 3 assumes all OHV users would remain on the designated OHV routes (trails and roads) and one area as directed by the Motor Vehicle Use Map (MVUM). The first MVUM is scheduled to be distributed in the spring of 2010. After the first MVUM is distributed, all OHV users would be required to remain on the designated OHV routes and one area, as required by the Final Travel Management Rule.

Although illegal use is not analyzed completely in the EIS, some of the project design criteria (PDC) minimize potential future illegal use. For example, PDC LE-2 requires the Forest Service to "plan and schedule for increased patrols during high use periods that can be utilized and implemented by Forest staff." This should decrease illegal use during these periods. Another example is PDC RD-7 which requires "all roads proposed to be closed to all traffic would be actively obliterated within sight distance from the designated OHV route." The requirement for active obliteration is to minimize the temptation for illegal use on these routes. In addition to the PDC, the route design and designation attempts to minimize illegal use by making the routes appealing to users. By providing appealing routes, such as loop opportunities, users would be less likely to create illegal routes.

In addition, several assumptions were made about the OHV use across the Forest for analysis purposes. These following assumptions allow all resource specialists to analyze the impacts and effects of each alternative consistently. Additional assumptions may have been made by each resource area. These assumptions are discussed in the individual sections of Chapter 3 or in the Specialist Reports located at the Forest Headquarters Office in Sandy, Oregon.

- User-created roads and trails are not National Forest System (NFS) roads and trails. They are unauthorized. The agency never took an affirmative action to create, manage, or construct them for public use. They were created by the public as a result of cross-country travel.

- Temporary roads, trails and areas built to support emergency operations or temporarily authorized in association with contracts, permits or leases are not intended for public use, including OHV use. Any proposal to add these temporary roads to the NFS road system would require a NEPA decision.

- No NEPA decision is necessary to continue use of the NFS roads by licensed motor vehicles as currently managed. As such, all licensed vehicles can use NFS roads. Licensed vehicles include dual-sport motorcycles and many Class II OHVs (e.g., jeeps and SUVs).

- All proposed trail construction would be field verified for road and stream crossings before implementation.

1 If resource damage occurs after OHV routes are designated on the MVUM, law enforcement and line officers have the ability to close an area. This authority will not change with this project.

- PDC would be applied effectively and would accomplish the necessary and desired outcome. Monitoring effectiveness of PDC and compliance would be a component of project implementation. (See Section 2.5 – Monitoring Strategy for more details.)

- Funding and law enforcement would be available to implement the project. No new trail construction would take place until funding is secured. Funding sources include appropriated funds, grant opportunities and volunteer and partnership organizations in-kind support.

2.3. Alternatives Considered in Detail

For Alternative 2, 3, and 4, the projects would be implemented using a combination of appropriated funding, grant funding (i.e., Oregon Parks and Recreation ATV Grant Program), and volunteer and partnership in-kind support. Currently, the Oregon Parks and Recreation ATV Grant Program helps pay for operation and maintenance, law enforcement, emergency services, land acquisition, leases, planning, development and safety education in Oregon's OHV recreation areas. No new construction would be completed until funding is secured. Funding for new trail construction would come from one of the three sources listed above.

2.3.1. Alternative 1 – No Action Alternative

The Alternative 1 – No Action Alternative represents the current conditions. The current OHV direction was developed in the 1980s as part of the forest planning process. Based on direction in the Forest Plan, the implied policy on the Forest is "open unless posted closed." The current law enforcement mechanism is signing an area as closed to OHV use. In order to enforce the closures, the sign must be posted and visible. Only a limited number of the OHV routes were designated through an interdisciplinary or public process. OHV use is occurring on a majority of roads because this use is not prohibited by State of Oregon regulations or Forest Service regulations. The areas where cross-country travel is not prohibited were designated during the Forest Planning process when OHV use was much less popular. This alternative does not include project design criteria or designated staging areas, nor does it include a Forest Plan Amendment or a MVUM. Alternative 1 does not meet the purpose and need for action for this project and it does not meet the intent of the Final Travel Management Rule.

Overall, this alternative allows OHV use on 2,463 miles of gravel and native surface roads[2], 49 miles of motorized trails, and 394,886 acres of forestland. This alternative provides the greatest opportunities for motorized recreation (see Appendix A, Alternative 1 OHV Use in the Mount Hood National Forest Map). Maps in Appendix A show the cross-country areas, roads and trails where OHV use is not prohibited for each Ranger District on the Forest. The components of Alternative 1 that will be discussed in the following sections are: general description and location of current OHV use, current OHV use, and land use allocations.

General Description and Location of Current OHV Use

The general forest area encompasses 1.1 million acres of the Forest in Multnomah, Clackamas, Hood River and Wasco counties with small pieces in Marion and Jefferson counties. Cross-country OHV travel and OHV travel on designated routes is allowed across much of the Forest, so site conditions vary greatly. Annual precipitation varies from 10 to 120 inches per year, primarily in the winter months. The average percent slope ranges from zero to 62 percent. The average elevation ranges from 25 to 5,400 feet. Current OHV use is located in nearly every fifth (5^{th}) field watershed on the Forest. There are over 1,600 miles of fish-bearing streams on the Forest, with approximately 300 miles supporting anadromous populations of salmon and steelhead. The general vegetation type, flora, and fauna present vary greatly. The general forest area encompasses westside lowland conifer-hardwood forest, eastside mixed conifer forest, montane mixed conifer forest, ponderosa pine/Douglas fir conifer forest, and lodgepole pine forest and woodland habitat types. This includes both deer and elk winter range and elk and deer calving areas as well as Northern spotted owl dispersal and suitable habitat.

2 The miles of gravel and native surface roads were determined using miles of Maintenance Level 1 and 2 roads, which are calculated using the INFRA database and GIS roads layer for the Forest. Both the database and GIS layer are updated on a regular basis to reflect new roads decision and to reflect changes identified on the road. These numbers represent the best information available on May 15, 2009.

Current OHV Use

Areas that allow cross-country OHV travel[3] are determined by the Mt. Hood Land and Resource Management (Forest Plan) standards and guidelines as well as Appendix C – Access and Travel Management Guide. In addition, additional areas have been closed to cross-country OHV travel through Forest Orders. Forest Orders are discussed in more detail in Section 1.6 Management Direction. Table 2-1 illustrates where and what type of OHV use is currently not prohibited in the general forest area based on Forest Plan direction, and Table 2-2 illustrates where and what type of OHV use is currently limited or prohibited in the general forest area based on Forest Orders. Based on these guidelines, cross-country travel is not prohibited on 394,886 acres of forestland. This represents 36 percent of the Forest. An undetermined amount of this land is inaccessible due to physical barriers, such as rock outcrops, steep slopes, dense forest vegetation, rivers and streams. Cross-country OHV travel is prohibited on 695,684 acres of the Forest. On the acres where cross-country OHV use is prohibited, OHV use is permitted on designated roads and trails on 203,881 acres and all OHV use is prohibited on 491,803 acres.

In addition, current Oregon State Law allows OHVs to operate on any road open to the public, which is not paved (e.g., gravel or native surface roads), unless the landowner applies more stringent regulations. To date, the Forest has closed individual roads to OHV use on a limited basis, but it has not approved any regulations across the Forest. As such, the Forest has allowed OHVs to use the majority of Level 1 and 2 gravel and native surface roads across the Forest. Although Level 1 roads are classified as closed roads, OHV use is permitted on these roads in areas where the land use allocation allows cross-country travel. Overall, this includes approximately 2,463 miles of roads. This represents 82 percent of all Level 1 and 2 roads across the Forest, which is approximately 3,021 miles. Also, this represents 73 percent of all Forest roads (Levels 1 through 5), which is approximately 3,383 miles. A complete list of the roads where OHV use is permitted is available in the project record, located at Mt. Hood National Forest Headquarters in Sandy, Oregon.

Table 2-1. Summary of where and what type of OHV use is currently not prohibited based on Forest Plan direction.

Land Allocation		OHV Use Prohibited	OHV Use Allowed on Designated Roads/Trails[1]	Cross-Country OHV Use Allowed	Special Circumstance Apply
A1	Wild, Scenic and Recreation and Recreational Rivers – White River		X		OHVs prohibited on Road 48 north of its junction with Road 43 between November 15 and April 1. Overlaps with B1 lands.
A2	Wilderness	X			
A3	Research Natural Areas		X		No OHV trails permitted.
A4	Special Interest Areas	X			OHVs allowed in powerline rights-of-way
A5	Unroaded Recreation	X			
A6	Semi-primitive Roaded Recreation		X		
A7	Special Old Growth		X		
A8	Spotted Owl Habitat Areas		X		Seasonal restriction from March 1 to September 30
A9	Key Site Riparian		X		
A10	Developed Recreations Sites	X			Only on access roads and parking areas.
A11	Winter Recreation		X		
A12	Outdoor Education Area		X		
A13	Bald Eagle Habitat Area		X		Only on designated trails and prohibited in active nesting areas from January 1 to August 15.
B1	Wild Rivers	X			

3 OHV cross-country travel is defined as an OHV leaving the designated road, trail or area.

Table 2-1. (continued)

Land Allocation		OHV Use Prohibited	OHV Use Allowed on Designated Roads/Trails[1]	Cross-Country OHV Use Allowed	Special Circumstance Apply
B1	Scenic and Recreational Rivers		X		
B2	Scenic Viewsheds			X	
B3	Roaded Recreation			X	Prohibited in Indian Mountain and Sherar Burn Road #2613
B4	Pine - Oak Habitat		X		
B5	Pine Marten/Pileated Wood-pecker		X		
B6	Special Emphasis Water-sheds		X		Prohibited in Still Creek and The Dalles Watersheds
B7	General Riparian Area		X		
B8	Earthflow Area		X		
B9	Wildlife/Visual Area		X		Only on open roads and designated park-ing areas
B10	Deer and Elk Winter Range		X		
B11	Deer and Elk Summer Range		X		Only on open roads and designated park-ing areas
B12	Back Country Lakes			X	Not within a ½ mile of Buck, Dinger, and Veda lakes; Not permitted within 100-feet of lake
C1	Timber Emphasis			X	
D	Bull Run	X			

1 Designated routes include existing trals and all open single-lane grgavel and native surface roads.

Table 2-2. Summary of where and what type of OHV use is currently limited or prohibited based on current Forest Orders.

Closed by Forest Order	OHV Use Prohibited	OHV Use Allowed on Designated Roads/Trails[2]
Gordon Creek Watershed	X	
The Dalles Watershed	X	
Summit Meadow		X
Old Maid Flat		X
Clear Lake	X	
Gibson Prairie		X
LaDee Flats		X
Camas Prairie		X
Ramsey Creek Parcel	X	

Finally, OHV use is permitted on the existing motorized routes across the Forest. Currently, there are three non-connected trails designated for motorized use: North Section Line trail (#451), Rhododendron Ridge trail (#564), and Rocky Butte trail (#476). Also, McCubbins Gulch is an existing motorized trail system, located on the Barlow Ranger District. All motorized trails are open to non-motorized use as well. McCubbins Gulch OHV trails are currently open to mountain bikes, horses, and hikers as well as motorized vehicles. More complete description of the McCubbins Gulch OHV trail system is available in Section 2.3.2: Alternative 2 – Proposed Action. Overall, OHV use is permitted on 48.5 miles of trails as shown in Table 2-3.

Table 2-3. Summary of existing motorized trails.

Trail Name	Trail Number	Miles	OHV Class Permitted
McCubbins Gulch	575, 576, 577	31.98	Class I and III
North Section Line	451	4.04	Class III
Rhododendron Ridge	564	10.4	Class III
Rocky Butte	476	2.07	Class III
Total		**48.5**	

Alternative 1 does not include any designated OHV staging areas; however, rock quarries and pits are often opportune staging areas. There are 61 rock quarries in the Forest. The average quarry size was conservatively estimated to be two acres with a parking capacity of 60 vehicles. As such, alternative 1 "staging areas" have the parking capacity for 3,660 vehicles.

Land Use Allocations

The Land Use Allocations (LUAs) for Alternative 1 are listed in Table 2-4 for all acres across the Forest, miles of roads, and miles of motorized trails. The majority of cross-country travel acres are located on C1-Wood Product Emphasis (58 percent) and B2-Scenic Viewsheds (38 percent) management areas. An additional three percent is on B3-Roaded Recreation and less than one percent is located on B12-Back Country Lakes management areas. Cross-country travel is prohibited within all other LUAs.

The majority of roads where OHV use (71 percent) is permitted are located in areas where cross-country travel also is not prohibited. The remainder of roads are located in LUAs where OHVs are allowed on designated roads and trails. For the roads where OHV use is permitted, 44 percent are on C1-Wood Product Emphasis lands; 25 percent are on B2-Scenic Viewsheds; 10 percent are in B6-Special Emphasis Watersheds; and seven percent are on B8-Earthflow Areas. Less than three percent of the roads are located on all other LUAs.

For motorized trails, Table 2-5 lists the LUA for each trail. The majority of the motorized trails are located on C1-Wood Product Emphasis Lands (66 percent). Trails are also in locations on B6-Special Emphasis Watersheds (14 percent), B2-Scenic Viewsheds (eight percent), B11-Deer and Elk Summer Range (seven percent), and B10-Deer and Elk Winter Range (three percent). All other LUAs include less than one percent of the trails.

Based on the Northwest Forest Plan management direction, OHV use is not prohibited within the Tier 1 Key Watershed, Riparian Reserve, Matrix, and Late Successional Reserve (LSR). The type of OHV use is determined by the Forest Plan LUA as explained above. OHV use is prohibited in Administratively Withdrawn Areas.

Table 2-4. Forest Plan land use allocations for Alternative 1 for areas, roads and trails.

Forest Plan Land Use Allocation 1		Acres of OHV Travel			Miles of Roads with OHV Travel		Existing Motorized OHV Trails
		Cross-Country Travel Allowed	Designated Roads/Trails Travel Only	Travel Prohibited	Cross-Country Travel Allowed	Designated Roads/Trails Travel Only	
A2	Wilderness Area, including newly designated Wilderness Areas			308,771			
A3	Research Natural Area		62				1
A3	Research Natural Area - Big Bend			778			
A3	Research Natural Area - The Dalles Watershed			295			
A4	Special Interest Area			25,238			
A5	Unroaded Recreation			5,113			
A6	Semi-primitive Roaded Recreation		78,987			26	
A7	Special Old Growth		1,261			1	
A9	Key Site Riparian Area		13,895			22	
A10	Developed Recreation Area			923			
A11	Winter Recreation Area		9,172			6	
A12	Outdoor Education Area		161			1	
A13	Bald Eagle Habitat Area		1,005			2	
A13	Bald Eagle Habitat Area - Clear Lake			51			
B1	Wild & Scenic River Corridor, including newly designated Wild & Scenic River Corridors			39,781			0
B2	Scenic Viewshed	151,383			606		4
B2	Scenic Viewshed - Clear Lake			1,651			
B2	Scenic Viewshed - Gibson Prairie		3,926			4	
B2	Scenic Viewshed - La Dee Flats		761			2	
B2	Scenic Viewshed - Old Maid Flat		1,107			5	
B2	Scenic Viewshed - Summit Meadow		1				
B3	Roaded Recreation	11,555			39		
B4	Pine-Oak Habitat		22,305			70	
B5	Pine Marten/Pileated Woodpecker		332				
B6	Special Emphasis Watershed		0			254	7
B6	Special Emphasis Watershed - Gordon Creek			1,972			
B6	Special Emphasis Watershed - Still Creek			3,772			
B6	Special Emphasis Watershed - The Dalles Watershed			12,553			

Table 2-4. (continued)

		Acres of OHV Travel			Miles of Roads with OHV Travel		Existing Motorized OHV Trails
Forest Plan Land Use Allocation 1		Cross-Country Travel Allowed	Designated Roads/Trails Travel Only	Travel Prohibited	Cross-Country Travel Allowed	Designated Roads/Trails Travel Only	
B8	Earthflow Area		30,471			162	
B9	Wildlife/Visuals Area		4,583			17	
B10	Deer and Elk Winter Range		15,326			54	1
B11	Deer and Elk Summer Range		11,377			45	4
B12	Backcountry Lakes	3,456			11		
C1	Wood Product Emphasis	228,492			1,093		32
C1	Wood Product Emphasis - Camas Prairie		1				
C1	Wood Product Emphasis - Clear Lake			4			
C1	Wood Product Emphasis - Gibson Prairie		4,831			26	
C1	Wood Product Emphasis - La Dee Flats		3,891			16	
C1	Wood Product Emphasis - Old Maid Flat		383			2	
D	Bull Run			90,901			
Sub-totals		**394,886**	**203,838**	**491,803**	**1,749**	**715**	**49**
Percent of Grand Total per Category		36.2%	18.7%	45.1%	71.0%	29.0%	n/a
Grand Total		1,090,526			2464		n/a

Table 2-5. Forest Plan land use allocations for motorized trails in Alternative 1.

Land Use Allocation	Miles of Trails
McCubbins Gulch	
A1-Wild, Scenic and Recreational Rivers – White River	0.4
B2-Scenic Viewshed	3.7
B10-Deer and Elk Winter Range	1.3
C1-Timber Emphasis	26.7
North Section Line Trail	
A3-Research Natural Area	0.5
B2-Scenic Viewshed	0.2
B6-Special Emphasis Watershed	2.3
C1-Timber Emphasis	1.1
Rhododendron Ridge	
B6-Special Emphasis Watershed	4.5
B11-Deer and Elk Summer Range	3.5
C1-Timber Emphasis	2.4
Rocky Butte	
C1-Timber Emphasis	2.1
GRAND TOTAL	**49**

2.3.2. Alternative 2 – Proposed Action

The Alternative 2 – Proposed Action would change OHV access on much of the Forest. The Proposed Action focuses on designated trails, roads, and areas for OHV use within six proposed locations. One location includes one small OHV area (approximately four acres) in an existing rock quarry. Figure 2-1 is a vicinity map for the six locations proposed in Alternative 2-Proposed Action. All Mt. Hood National Forest System lands were considered by the Forest Service and members of the public during a two-year long dialogue with the public as described in the Alternative Development Process (Section 2.1). The proposed OHV systems that resulted from this dialogue were designed to provide a balance between providing recreational opportunities and protecting natural resources. Overall, this alternative allows OHV use on 124 miles of road and 97 miles of trail. After the Record of Decision is signed for this project, the Final Travel Management Rule would require all OHVs to remain on these designated routes and area, and no OHV cross-country travel would be permitted. OHVs would be permitted only on the routes and areas designated by the selected alternative.

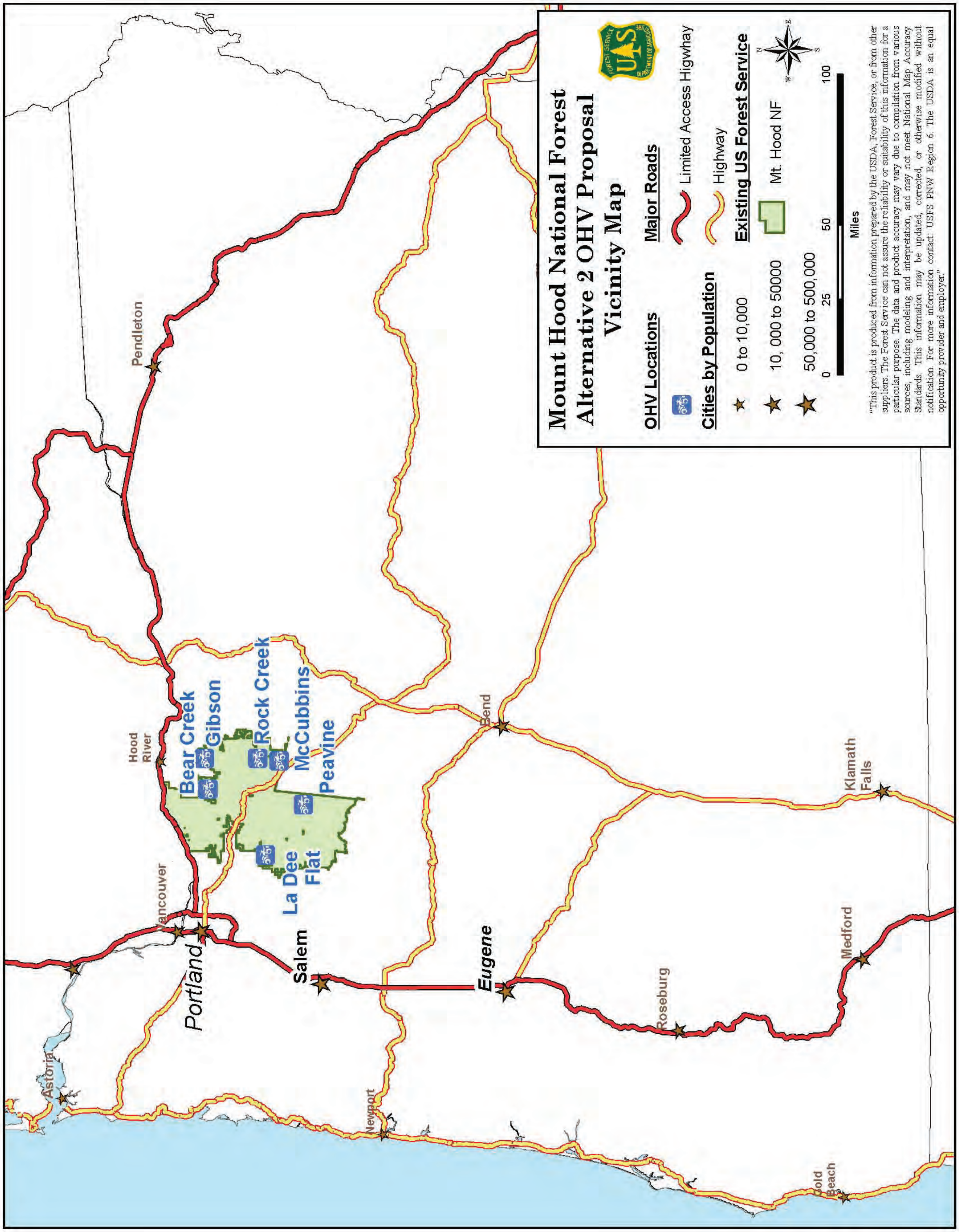
The six locations considered in Alternative 2 are: Bear Creek, Gibson Prairie, LaDee Flats, McCubbins Gulch, Peavine, and Rock Creek (see Appendix A, Alternative 2 OHV Proposal Overview Map). Each of the proposed OHV systems and components of Alternative 2 are discussed in the following sections. The components include: general description, proposed OHV systems, land use allocations, general forest area, and Forest Plan Amendment.

General Description and Location of each Proposed OHV System

Bear Creek: The Bear Creek proposed OHV system is located north of Mt. Hood at the upper reaches of the Middle Fork Hood River watershed just north of Laurance Lake. The OHV system is located on the Hood River Ranger District approximately six miles southwest of Parkdale and is accessed by the 16 road system. The legal description for the proposed OHV routes is T1S, R9E in Hood River County, Oregon (see Appendix A, Alternative 2 OHV Proposal Bear Creek Map).

Elevations are fairly high ranging from 3200 feet to 4800 feet. This OHV system is located within the East Fork Hood River and West Fork Hood River fifth field watersheds. There are around 4.5 miles of intermittent streams and 12.5 miles of perennial streams in the general area. Soils are derived from volcanic ash that has undergone considerable mixing with glacial deposits, resulting in rocky, sandy soils. These soils are similar to those in the Peavine and Graham Pass proposed OHV systems. The general area includes montane mixed conifer habitat type as well as deer and elk summer range.

Figure 2-1. Vicinity Map for Alternative 2-Proposed Action.



Gibson Prairie: The Gibson Prairie proposed OHV system is located on the Hood River Ranger District approximately four miles southeast of Parkdale and is accessed by the 17 Road. The legal description for the proposed OHV routes is T1N, R10-11E in Hood River County, Oregon (see Appendix A, Alternative 2 OHV Proposal Gibson Prairie Map). Gibson Prairie is at the center of this proposed OHV system.

Elevations range from 3400 feet to 4000 feet. This system is located within the Mosier Creek and Hood River fifth field watersheds. There are around five miles of intermittent streams and 7.6 miles of perennial streams in the general area. Soils have been derived from deep volcanic ash deposits that overlie old glacial deposits. The general area includes suitable spotted owl habitat as well as deer and elk summer range, and calving and fawning areas. Grand fir and Douglas fir dominate the sparse forests. Plant associations encountered include Grand fir/Oceanspray, Grand fir/ Snowberry and Douglas fir/Snowberry.

LaDee Flats: The LaDee Flats proposed OHV system is located on the Clackamas River Ranger District just south of the town of Estacada and is accessed by the 4610 Road. The legal description for the proposed routes is T4S, R5-7E and T5S, R7E, Section 1 in Clackamas County, Oregon (see Appendix A, Alternative 2 OHV Proposal LaDee Flats Map). The majority of OHV routes considered are located on LaDee Flat, a plateau separating the North Fork Clackamas and Clackamas Rivers just above their confluence.

The general area is in a wide elevation band ranging from 1400 feet to 4600 feet. This system is located entirely within the Middle Clackamas River fifth field watershed. There are around 15 miles of intermittent streams and 10 miles of perennial streams in the general area. Soils on this flat are not highly erosive due to very level terrain and because the high amount of sticky clay tends to hold particles together. LaDee Flats includes extensive dispersal habitat for Northern spotted owl as well as deer and elk summer and some winter range. The forested areas are approximately seventy years old and the plant association is Western Hemlock/Dwarf Oregon Grape/Swordfern.

McCubbins Gulch: The McCubbins Gulch proposed OHV system is already established Class I and III OHV trail system. The analysis area is approximately 10 miles west of the community of Wapinitia on the Barlow Ranger District and is accessed by the roads 2130 and 2110 of Highway 216. The legal description for the proposed routes is T5S, R10-11E in Wasco County, Oregon (see Appendix A, Alternative 2 OHV Proposal McCubbins Gulch Map). Adjacent to the north boundary of the Warm Springs Indian Reservation, the McCubbins Gulch proposed OHV system is situated on the watershed divide between the White River and Beaver Creek, a major tributary of the Warm Springs River.

Elevations range from 2800 feet to 3600 feet. Average annual precipitation is highly variable ranging between approximately 22 to 38 inches. This system is located within the Middle Deschutes River, White River and Beaver Creek fifth field watersheds. There are around 20 miles of intermittent streams and 11.8 miles of perennial streams in the general area. Soils have been derived from deep volcanic ash deposits that overlie old glacial deposits. Deer and elk summer range are located in proposed OHV system. The forest areas fall in the Grand fir series and include the Grand fir/Chinkapin, Grand fir/Oceanspray, Grand fir/ Snowberry, and Grand fir/Twinflower plant associations.

Peavine: The proposed Peavine proposed OHV system is located on the crest of the Cascades near the headwaters of the Clackamas River and the Warm Springs River. The Peavine proposed OHV system is located approximately 21 miles northeast of Detroit, Oregon, in Clackamas and Wasco Counties on the Clackamas River Ranger District. The proposed OHV system is accessed by the 42 and 57 road systems. The legal description of the proposed routes is T6-7S, R8E in Clackamas and Wasco Counties, Oregon (see Appendix A, Alternative 2 OHV Proposal Peavine Map). The area takes its name from Peavine Mountain (4812 feet), a prominent landform in the northwest corner of the proposed OHV location.

Elevations range from 2800 feet to 5000 feet. This system is located within the Oak Grove Fork Clackamas River and Upper Clackamas River fifth field watersheds. There are around 36 miles of intermittent streams and 17.4 miles of perennial streams in the analysis area. Soils are derived from volcanic ash that has undergone considerable mixing with glacial deposits, resulting in rocky, sandy soils. The general area includes marginal spotted owl habitat type and deer and elk calving areas. Silver fir/ big huckleberry/beargrass is the primary plant association with lesser amounts of Mountain hemlock/grouse huckleberry in the higher elevations.

Rock Creek: This system of roads and trails is located west of Rock Creek Reservoir and includes the Badger Lake road. The proposed Rock Creek proposed OHV system is adjacent to the Sportsman's Park Community (a private in-holding on the Forest) and located approximately 12 miles west of the town of Wamic in Wasco County on the Barlow Ranger District. The proposed OHV system is accessed by the 4820 Road. The legal description of the proposed routes is T4S, R10-11E in Wasco County, Oregon (see Appendix A, Alternative 2 OHV Proposal Rock Creek Map).

The general area is in a wide elevation band ranging from 2200 feet to 5400 feet. This system is located within the White River and Tygh Creek fifth field watersheds. There are around 23.3 miles of intermittent streams and 21.7 miles of perennial streams in the analysis area. Soils and landform are similar, dryer versions of the McCubbins analysis area, with more open grassland meadows and higher pH 'sweet' soils. Elk and deer winter range are located in the general area. The forest is dominated by Grand fir, Douglas fir, Ponderosa pine and western Larch. The primary plant association is Grand fir/ Snowberry.

Proposed OHV Systems

For each of these six locations, a system of OHV routes was proposed as summarized in Table 2-6. The routes include mixed-use roads, decision roads converted to OHV trails, existing motorized trails, and new motorized trails. Each of type of route is defined as follows.

- *Convert to trails*: Decision roads are defined in the 2003 Mt. Hood National Forest Roads Analysis as roads which are not needed to provide access to recreation opportunities or other management activities. They are labeled "decision roads" because a NEPA decision needs to be made on whether to close, decommission, or keep them open. This NEPA process is proposing to convert these roads to OHV trails. After these roads are converted to OHV trails, they would be managed to trail standards and maintained by the recreation staff.

- *Motorized mixed-use roads*: National Forest System (NFS) road designated for use by both highway-legal and specific classes of OHV vehicles.

- *Decommissioned*: These are decision roads that would be closed to all motorized vehicle traffic as part of this project. After the OHV routes are designated, these roads would be decommissioned and taken off the National Forest System road atlas. The portion of the road within sight distance would be actively obliterated as directed by PDC RD-7 to discourage future OHV use. The remaining length of decommissioned road should be left in hydrologically stable condition. Actions to achieve hydrologic stability could include, but are not limited to, culvert removal, water bar, and ditch cleaning. Table 2-7 provides a summary of the roads to be decommissioned in Alternative 2.

- *Existing motorized trails*: These are currently designated OHV trails on the Forest. The majority of these trails are within the McCubbins Gulch system.

- *New motorized trail construction*: New trail construction is proposed to connect roads and trails and provide loop opportunities. New motorized trails also include some user-created routes which are non-system roads and trails constructed without the authorization of the Forest Service. These trails would be brought up to Forest Service trail standards as part of this project. User-created trails are estimated in Table 2-8.

New motorized trail construction and convert to trails routes would be open to non-motorized users as well. All roads that are proposed as motorized mixed use or converted to OHV trail are shown in Appendix E – Alternative 2 Road Data.

All of the routes are designated by class of OHV according to State of Oregon. The State of Oregon considers all vehicles intended for off-highway use to be all-terrain vehicles (ATVs). ATVs are broken into three classes as follows:

Class I ATV (quads, 3-wheelers)
- Vehicles 50-inches 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 State of Oregon defines an OHV as "term used to describe all vehicles designed for off-highway travel and classified as one of the three classes of ATVs in Oregon." OHV and ATV are used interchangeable in this document. The State regulates and licenses vehicles. Because the recreating public is most familiar with State OHV classes, this EIS uses State terminology to describe the permitted vehicles.

Table 2-6. Miles of OHV routes proposed by class for each system in Alternative 2.

OHV System	OHV Class	Road Routes (miles)		Trail Routes (miles)		Total Route Miles by Location
		Convert to Trail	Motorized Mixed Use	Existing Trails	New Trail Construction	
Bear Creek	Class III	0	0	0	39.1	39.1
Gibson Prairie	Class I	1.8	5.1	4	4.3	15.2
LaDee Flats	Class I, II, and III	5.4	19.1	0	0.4	38.9
	Class I and III	4.5	0	0	1.2	
	Class II	0	8.3	0	0	
McCubbins Gulch	Class I and III	4.7	8.8	32	0	50.6
	Class III	0	0	0	5.1	
Peavine	Class I, II, and III	19.6	15.2	0	3	37.8
Rock Creek	Class I and III	14.6	16.7	2.1	6.2	39.6
Total Miles		**51**	**73**	**38**	**59**	**221**

Table 2-7. Miles of roads to be decommissioned in Alternative 2.

OHV System	Miles
Bear Creek	0.0
Gibson Prairie	0.0
LaDee Flats	3.7
McCubbins Gulch	0.9
Peavine	8.0
Rock Creek	0.0
Total Miles	13

Table 2-8. Miles of new trail construction, including estimated mileage of user-created trails, for Alternative 2.

OHV System	User-created Trails	New Trail Construction
Bear Creek	0.0	39.1
Gibson Prairie	0.0	4.3
LaDee Flats	0.2	1.4
McCubbins Gulch	2.7	2.4
Peavine	1.1	1.9
Rock Creek	3.3	2.9
Totals	7.3	52.0
Grand Total	**59.3**	

Each proposed system includes a staging area as shown in Table 2-9. The staging areas would be a day-use area that serves as a trailhead for motorized recreation. McCubbins Gulch Campground would continue to be the staging area for this OHV location. No improvements are proposed to any staging areas, except potentially a bathroom facility as required by PDC RM-7. In this alternative, there are no restrictions on OHV trails or use (e.g., nighttime use of trails is permitted). All OHVs must follow State laws, including the use of headlights.

Table 2-9. Proposed staging areas for Alternative 2.

OHV System	Site Description	Legal Description	Size (Acres)	Parking Capacity
Bear Creek	Storage Pit, Road 16	T1S, R9E, Sec 9, NE1/4	0.4	11
	Storage Pit, Road 1610	T1S, R9E, Sec 10, NW1/4	0.4	9
Gibson Prairie	Range Allotment Loading Area	T1S, R10E, Sec 11, SE1/4	0.7	18
LaDee Flats	No Whisky Timber Sale Landing	T4S, R5E, Sec 20, NE1/4	1.0	30
McCubbins Gulch	McCubbins Campground	T5S, R10E, Sec 24, SW1/4	8.0	20
Peavine	Warm Springs Quarry	T7S, R8E, Sec 2, SE1/4	5.2	150
Rock Creek	Post Point Quarry	T4S, R10E, Sec 26, NE1/4	4.1	130
Total Area/Capacity Across Forest			**20**	**368**

Alternative 2 includes two additional components. First, Alternative 2 includes one small OHV area (North Fork Quarry) in the LaDee Flats location. This proposed OHV area is approximately four acres in size and is currently used by OHVs. This OHV area is in a currently disturbed rock quarry. The quarry is located on Road 4610-120. The legal description is T4S, R6E, Section 19, NE ¼, SE ¼. OHVs would not be permitted outside the North Fork Quarry OHV area. All staging areas and proposed OHV area are within rock quarries that may be needed for future management activities. PDC RD-6 states: "Allow temporary suspension of use of staging areas and designated OHV area, if necessary, where located in rock sources while rock resource operations are conducted" to avoid any conflicts.

Second, Alternative 2 would create a day-use area within the general area of the Rock Creek location. This area imposes restrictions on campfires and overnight occupancy in a 3,533 acre area adjacent to Gate Creek Ditch in the vicinity of the Sportsman's Park community. The proposed day-use area overlays the Wildland-Urban Interface (WUI) for Sportsman's Park, as defined by Wasco County.

As directed by PDC O-2 through O-6, the proposed OHV routes and staging areas in the Peavine, Gibson Prairie, McCubbins Gulch, Rock Creek, and Bear Creek areas would be closed for part of the year.

- Peavine designated OHV routes would be closed to protect deer and elk winter range and habitat during deer and elk calving season, and to prevent erosion from December 1 to June 15 (PDC O-2).
- Gibson Prairie designated OHV routes would be closed to protect deer and elk winter range, and habitat during deer and elk calving season from November 1 to June 15 (PDC O-3).
- McCubbins Gulch and Rock Creek designated OHV routes would be closed to protect deer and elk winter range from December 1 to April 1 (PDC O-4).
- Bear Creek designated OHV routes would be closed to prevent soil sedimentation on native trails from November 1 to June 1. No new construction would occur in Bear Creek from November 1 to June 1 to prevent erosion (PDC O-5).

All new trails proposed for construction as well as road-to-trail conversions would be open to non-motorized users. McCubbins Gulch proposed OHV system is currently open to mountain bikes, horses, and hikers as well as motorized vehicles; this would remain unchanged in all action alternatives.

All designated routes would be depicted on the MVUM. The MVUM designates the roads, trails, and areas on an administrative unit or a Ranger District of the National Forest System. The map would be updated on an annual basis, as required by Forest Service direction and the Final Travel Management Rule, to reflect any changes in the motor vehicle use across the Forest. Any changes to the motor vehicle access and use would require public involvement and may include additional NEPA analysis. The MVUM would be the new enforcement tool; all motorized recreationalists would need to consult the map to determine what routes are open. Routes would not longer be required to be posted as closed.

Land Use Allocations

As described in Section 1.6 Land Use Allocations, the proposed routes cross through a variety of Forest Plan Land Use Allocations and Northwest Forest Plan Land Use Allocations. Table 2-10 lists the LUAs for the six proposed OHV systems. The majority of roads (71 percent) and trails (80 percent) are located on C1-Timber Emphasis Lands. For roads, an additional 12 percent are located in B3-Roaded Recreation and seven percent are located in B11-Deer and Elk Summer Range. For trails, an additional seven percent are located on B10-Deer and Elk Winter Range and five percent are located on B2-Scenic Viewshed. Less than five percent of the remaining miles of roads and trails are located in the other LUAs.

The Forest Plan Standards and Guidelines for the A3-Research Natural Areas, A4-Special Interest Areas, A7-Special Old Growth, A9-Key Site Riparian, and B6-Special Emphasis Watershed discourage or prohibit OHV use. The roads and trails included in this alternative are all existing motorized routes on the Forest. This includes 0.5 miles of trails on A3 lands; 1.7 miles of roads on A4 lands; 0.3 miles of road on A7 lands; 0.5 miles of roads and 0.1 miles of trails on A9 lands; and 0.3 miles of road and 4.1 miles of trail on B6 lands. No new OHV trail construction would be permitted in these LUAs.

Table 2-10. Forest Plan land use allocations for Alternative 2.

Land Use Allocation	Miles of Roads[1]	Miles of Trails	Total Miles
Bear Creek OHV System			
B6-Special Emphasis Watershed	0.0	1.8	1.8
C1-Timber Emphasis	0.0	37.3	37.3
Gibson Prairie OHV System			
A3-Research Natural Area	0.0	0.5	0.5
A7-Special Old Growth	0.3	0.0	0.3
B2-Scenic Viewshed	0.0	1.4	1.4
B6-Special Emphasis Watershed	0.3	2.3	2.5
B10-Deer and Elk Winter Range	1.7	0.0	1.7
C1-Timber Emphasis	4.7	4.2	8.9

Table 2-10. (continued)

Land Use Allocation	Miles of Roads[1]	Miles of Trails	Total Miles
LaDee Flats OHV System			
A4-Special Interest Area	1.7	0.0	1.7
A9-Key Site Riparian Area [2]	0.2	0.0	0.2
B2-Scenic Viewshed	1.6	0.2	1.8
B3-Roaded Recreation	11.0	0.0	11.0
C1-Timber Emphasis	22.8	1.4	24.2
McCubbins Gulch OHV System			
A1-Wild, Scenic and Recreational Rivers – White River	0.0	0.4	0.4
B2-Scenic Viewshed	0.5	3.7	4.2
B10-Deer and Elk Winter Range	0.6	6.4	7.0
C1-Timber Emphasis	12.4	26.7	39.0
Peavine OHV System			
A9-Key Site Riparian Area	0.3	0.1	0.4
B2-Scenic Viewshed	0.2	0.0	0.2
B3-Roaded Recreation	3.8	0.0	3.8
B11-Deer and Elk Summer Range	8.2	0.0	8.2
C1-Timber Emphasis	22.3	3.0	25.3
Rock Creek OHV System			
B2-Scenic Viewshed	1.0	0.4	1.4
B4-Pine/Oak (Wildlife Emphasis)	3.8	2.5	6.2
C1-Timber Emphasis	26.5	5.4	31.9
GRAND TOTAL	**124**	**97**	**221**

1 - Decommissioned roads are not included.
2 - Existing road located on the boundary of A9 lands.

Table 2-11 lists the Northwest Forest Plan Land Use Allocations for the six proposed systems. Overall, 90 percent of the proposed routes are located on Matrix lands. The remaining ten percent are located in Late-Successional Reserves (LSR). Approximately 0.1 miles of an existing road within an administratively withdrawn area is included in this alternative.

Table 2-11. Northwest Forest Plan land use allocations for Alternative 2.

Land Use Allocation	Miles of Roads[1]	Miles of Trails	Total Miles
Bear Creek OHV System			
Matrix	0.0	39.1	39.1
Gibson Prairie OHV System			
Administratively Withdrawn [2]	0.3	0.5	0.8
Matrix	6.9	7.8	14.7
LaDee Flats OHV System			
Late Successional Reserve	14.2	0.0	14.2
Matrix	23.1	1.6	24.7
McCubbins Gulch OHV System			
Late Successional Reserve	2.0	5.8	7.8
Matrix	11.5	31.3	42.8

Table 2-11. (continued)

Land Use Allocation	Miles of Roads[1]	Miles of Trails	Total Miles
Peavine OHV System			
Matrix	34.8	3.0	37.8
Rock Creek OHV System			
Administratively Withdrawn [2]	0.1	0.0	0.1
Matrix	31.3	8.3	39.6
GRAND TOTAL	**124**	**97**	**222**

1 - Decommissioned roads are not included
2 - Existing routes located in Administratively Withdrawn Area

In addition to these Northwest Forest Plan LUAs, proposed OHV routes are found within riparian reserves, which overlap these allocations, as shown in Table 2-12. Approximately 10 percent of the proposed OHV routes are located within riparian reserves. The effects of proposed OHV routes within these riparian reserves are discussed in Section 3.4 Water Quality and Section 3.5 Fisheries.

Table 2-12. Proposed OHV routes within Riparian Reserves for Alternative 2.

OHV System	Miles of Roads [1]	Percent All Roads	Miles of Trails	Percent All Trails	Total Miles	Percent All Routes
Bear Creek	0.0	0.0%	2.4	0.0%	2.4	6.2%
Gibson Prairie	1.1	13.2%	0.1	2.0%	1.2	8.2%
LaDee Flats	5.1	322.8%	0.0	0.0%	5.1	13.1%
McCubbins Gulch	2.3	6.1%	4.2	31.3%	6.5	12.8%
Peavine	4.0	132.0%	0.7	2.0%	4.7	12.5%
Rock Creek	1.4	17.3%	0.6	1.8%	2.0	5.0%
Total	13.9	14.3%	8.1	6.5%	22.0	9.9%

1 - Decommissioned roads are not included

General Forest Area

The general forest area includes all remaining roads, trails and areas on the Forest, located in Clackamas, Multnomah, Hood River, and Wasco counties as well as small portions of Marion and Jefferson counties. After the Record of Decision is signed for this project, no OHV use would be allowed outside of the designated routes, staging areas, and North Fork Quarry OHV area (4-acres) as described in the previous section based on the direction in the Final Travel Management Rule. Also, the Rule would prohibit cross-country OHV use. This would change the current OHV policy on the Forest from "open unless posted closed" to "closed unless designated open." A Forest Plan Amendment (as described in the following section) is required to accomplish this policy change. This does not change current policy for the National Forest System road system: All licensed vehicles, including dual-sport motorcycles, are allowed on roads. Licensed vehicles exclude quads and three-wheeled vehicles.

Forest Plan Amendment

Under the existing Forest Plan, eleven standards and guidelines allow cross-country OHV use off designated routes (FW-447, FW-459, FW-465, A4-038, B1-077, B1-078, B1-079, B3-038, B11-037, C1-041, and C1-042). An additional nine standards and guidelines require areas closed to OHV use to be posted (FW-413, FW-483, FW-543, A3-006, A3-007, B1-082, B1-083, B5-001, and B5-002). These 20 standards and guidelines do not comply with the Final Travel Management Rule. In addition, the monitoring element for Off-Road Vehicle Use (Forest Plan, page 5-69 to 5-70) would be replaced with the Monitoring Framework outlined in Section 2.5 as part of the proposed Forest Plan Amendment. The proposed Monitoring Framework is more applicable to the actions proposed in the action alternatives and more accurately reflects the current Forest Service approach to monitoring. As a result, this EIS proposes to amend these twenty standards and guidelines (Table 2-13) to limit OHV use to designated routes, prohibit cross-country travel by OHVs, replace the enforcement tool to the MVUM, and to remove the requirement to post areas or roads as closed to OHV use.

In addition, the proposed Forest Plan Amendment for Alternative 2 includes six additional standard and guidelines that prohibit OHV use on existing roads and trails (A3-040, A4-039, A7-024, A9-039, B6-036 and B6-037). The proposed amendment (Table 2-14) would allow historic OHV use to continue on existing roads and trails. No new trail construction would be permitted in these Land Use Allocations. Section 3.16 Forest Plan Amendment analyzes the significance of this amendment.

After implementation of this Forest Plan Amendment, only designated routes would be available for OHV use. All other roads, trails, and areas would be closed to OHV use, unless additional NEPA analysis is completed. This would be Amendment #17 to the Forest Plan.

Table 2-13. Proposed standards and guidelines for Forest Plan Amendment #17 for all action alternatives. Suggested changes are italic or strikethrough print. The proposed changes limit OHV use to designated routes, prohibit cross-country travel, replace the enforcement tool to the Motor Vehicle Use Map (MVUM), and eliminate the requirement to post areas or roads closed to OHV use.

Standard	Page	Standard and GUIDELINE	PROPOSED Amendment
FW-413 Transportation	4-95	Roads, areas and trails closed or restricted to recreational access shall be posted.	Roads, areas and trails ~~closed or restricted~~ opened to recreational access shall be ~~posted~~. designated on a map.
FW-447 Transportation	4-97	Off-road vehicle trails should not incorporate open roads as part of the trail system.	~~Off-road vehicle trails should not incorporate open roads as part of the trail system~~. *All off-road (off highway) routes and trails shall be designated on a map.*
FW-459 Dispersed Recreation	4-98	Off-road vehicle (ORV) trails should not incorporate open roads as part of the trail system.	~~Off-road vehicle (ORV) trails should not incorporate open roads as part of the trail system~~. *All off-road (off highway) routes and trails shall be designated on a map.*
FW-465 Dispersed Recreation	4-99	Opportunities for ORV use should be available except where not allowed by management direction, and where determined to adversely impact land capability and resource values (see Appendix C, Travel and Access Management Guide, and see Forest Transportation System/ Facilitates; Travel and Access Standards and Guidelines)	Opportunities for ORV use should not be available except where not allowed by management direction, and where determined to not adversely impact land capability and resource values ~~(see Appendix C, Travel and Access Management Guide, and see Forest Transportation System/Facilitates; Travel and Access Standards and Guidelines)~~
FW-483 Wild & Scenic Rivers	4-102	Areas, roads and segments of rivers closed to vehicle use shall be posted.	Areas, roads and segments of rivers ~~closed~~ opened to vehicle use shall be ~~posted~~. designated on a map.
FW-543 Visual Resource Management	4-106	Areas, roads and segments of rivers closed to vehicle use shall be posted	Areas, roads and segments of rivers ~~closed~~ opened to vehicle use shall be ~~posted~~. designated on a map.
A3-006, A3-007 Research Natural Areas	4-147	Off-road vehicles (ORV) and non-motorized bicycle use shall be prohibited. RNAs shall be posted as closed to ORV and non-motorized bicycle use.	~~Off-road vehicles (ORV) and non-motorized bicycle use shall be prohibited. RNAs shall be posted as closed to ORV and non-motorized bicycle use~~. *Off-road motorized vehicle use shall not be permitted except on designated routes. Only existing roads or trails shall be designated on a map.*

Table 2-13. (continued)

Standard	Page	Standard and GUIDELINE	PROPOSED Amendment
A4-038 Special Interest Area	4-156	Recreational off-road vehicle use shall be prohibited except as noted in items 4 [A4-039] and 5 [A4-040], below.	~~Recreational off-road vehicle use shall be prohibited except as noted in items 4 [4-039] and 5 [A4-040], below~~. *All off-road (off highway) routes and trails shall be designated on a map.*
B1-077, B1-078, B1-079 Wild, Scenic and Recreational Rivers	4-216	Within scenic and recreational river corridors, motorized use shall be limited. 1) Motorized vehicles shall be permitted only on open roads. 2) Off-road vehicles (ORV) may occur only on designated trails.	~~Within scenic and recreational river corridors, motorized use shall be limited. 1) Motorized vehicles shall be permitted only on open roads.~~ ~~2) Off-road vehicles (ORV) may occur only on designated trails~~. *All off-road (off highway) routes and trails shall be designated on a map.*
B1-082, B1-083 Wild, Scenic and Recreational Rivers	4-216	Areas, roads and segments of rivers closed to vehicle use shall be posted. Administrative use of motorized vehicles shall be allowed in all river segments.	Areas, roads and segments of rivers ~~closed~~ *opened to* vehicle use shall be *posted*. *designated on a map*. Administrative use of motorized vehicles shall be allowed in all river segments.
B3-038 Roaded Recreation	4-232	Off-road vehicle use shall be encouraged on designated trails and/or areas.	~~Off-road vehicle use shall be encouraged on designated trails and/or areas~~. *All off-road (off highway) routes and trails shall be designated on a map.*
B5-001, B5-002 Pileated Woodpecker / Pine Marten Habitat Area	4-242	Off-road motorized vehicle use should not be permitted except on designated trails. All areas and rails closed to off-road vehicle use shall be posted.	Off-road motorized vehicle use ~~should~~ *shall* not be permitted except on designated ~~trails~~ *routes*. All ~~areas~~ *roads* and trails ~~closed~~ open to off-road vehicle use ~~shall~~ should be ~~posted~~. *designated on a map)*.
B11-037 Deer and Elk Summer Range	4-280	Recreational motorized vehicle activity shall not be permitted except on open roads and designated parking areas.	~~Recreational motorized vehicle activity shall not be permitted except on open roads and designated parking areas.~~ *All off-road (off highway) routes and trails shall be designated on a map.*
C1-041, C1-041 Timber Emphasis	4-294	Off-road vehicle (ORV) use should be encouraged. ORV use should be restricted within specific areas with conflicting resource objectives.	~~Off-road vehicle (ORV) use should be encouraged. ORV use should be restricted within specific areas with conflicting resource objectives.~~ *All off-road (off highway) routes and trails shall be designated on a map.*
Monitoring Element: Off-Road Vehicle (ORV) Use	5-69	• Are high quality ORV opportunities provided in areas which are suitable for ORV use and the needs, skills, and interests of users? • Are the ORV opportunities provided effective in minimizing conflicts between user groups and safe for users and the general public? • Are ORV opportunities being located, designated, and managed to minimize the negative effects (within acceptable limits) on key fish and wildlife species and sensitive habitats?	Replace all language with the following. Are OHV remaining on the designated system of routes? • Are the trail widths being maintained or widened? • Are the signs being maintained and followed? • Is the Motor Vehicle Use Map (MVUM) being updated and distributed effectively on an annual basis? • Is the selected alternative being implemented properly? Is the selected alternative having the intended effects? • Are the project design criteria being implemented properly? Are the design criteria having the intended effect?

Table 2-14. Additional proposed standards and guidelines for Forest Plan Amendment #17 for Alternative 2 – Proposed Action. Suggested changes are italic or strikethrough print. The proposed changes allow OHV to continue using existing roads and trails; no new OHV trail construction would be permitted.

STANDARD	PAGE	STANDARD AND GUIDELINE	PROPOSED AMENDMENT
A3-40 Research Natural Areas	4-149	All forms of off-road vehicle use shall be prohibited.	~~All forms of off-road vehicle use shall be prohibited.~~ *Off-road motorized vehicle use shall not be permitted except on designated routes.*
A4-039 Special Interest Area	4-156	Off-road vehicle uses in powerline rights-of-way should be allowed where consistent with other management direction, e.g. riparian and cultural resources protection.	~~Off-road vehicle uses in powerline rights-of-way should be allowed where consistent with other management direction, e.g. riparian and cultural resources protection.~~ *Off-road motorized vehicle use shall not be permitted except on designated routes.*
A7-024 Special Old Growth	4-172	Recreation off-road vehicle use should be prohibited.	~~Off-road vehicle uses in powerline rights-of-way should be allowed where consistent with other management direction, e.g. riparian and cultural resources protection.~~ *Off-road motorized vehicle use shall not be permitted except on designated routes. Only existing roads or trails shall be designated.*
A9-039 Key Site Riparian	4-184	Recreation off-road vehicle use, except over-snow vehicles, shall be prohibited.	~~Recreation off-road vehicle use, except over-snow vehicles, shall be prohibited.~~ *Off-road motorized vehicle use shall not be permitted except on designated routes. Only existing roads or trails shall be designated.*
B6-036, B6-037 Special Emphasis Watershed	4-251	Recreational off-road vehicle use (other than over-snow) shall be discouraged. Recreational off-road vehicle use shall be prohibited in Still Creek and The Dalles Watershed Management Unit.	~~Recreational off-road vehicle use (other than over-snow) shall be discouraged. Recreational off-road vehicle use shall be prohibited in Still Creek and The Dalles Watershed Management Unit.~~ *Off-road motorized vehicle use shall not be permitted except on designated routes. Only existing roads or trails shall be designated.*

2.3.3. Alternative 3

Similar to the Proposed Action, Alternative 3 would change OHV access through much of the Forest. This alternative considered all additional motorized routes proposed by the public during the scoping comment period. Alternative 3 designates additional routes in the Bear Creek, LaDee Flats, McCubbins Gulch, Peavine, and Rock Creek proposed systems. Although the proposed OHV routes in the Gibson Prairie area decrease, the routes in Alternative 3 provide access to a larger OHV system on private and Hood River County lands to the north[4]. In addition, two additional locations are added to this alternative. The Graham Pass proposed system adds the existing Rho Ridge motorized trail and an adjoining system of gravel roads and Mount Defiance adds a system of gravel roads that access existing Hood River County[4] OHV routes. Figure 2-2 is a vicinity map for the eight locations proposed in Alternative 3.

In addition, recommendations resulting from government-to-government consultation were incorporated into this alternative. Based on consultation with the Confederated Tribes of Warm Springs, the routes in the proposed Peavine system have been altered. The revised system does not include routes to the south of the Warm Spring River and adds additional routes to the west. Based on recommendations from consultation with Wasco County, the routes

4 Maps of the county OHV systems are available from Hood River County and are contained in the project record located at the Mt. Hood National Forest Headquarters in Sandy, Oregon.

in the proposed Rock Creek system have been altered. The resulting system only includes one access route within the Wildland Urban Interface (WUI) and increases the mileage to the west. This system represents a compromise between Wasco County and the residents of Sportsman's Park. Overall, Alternative 3 allows OHV use on 223 miles of roads and 102 miles of trails. After the Record of Decision is signed for this project, the Final Travel Management Rule would require all OHVs to remain on these designated routes and area, and no OHV cross-country travel would be permitted. OHVs would be permitted only on the routes and areas designated by the selected alternative.

The proposed OHV systems considered in Alternative 3 are: Bear Creek, Gibson Prairie, Graham Pass, LaDee Flats, McCubbins Gulch, Mount Defiance, Peavine, and Rock Creek (see Appendix A, Alternative 3 OHV Proposal Overview Map). Each of the proposed systems and components of Alternative 3 are discussed in the following sections. The components include: general description, proposed OHV systems, land use allocations, and Forest Plan Amendment.

General Description and Location of each Proposed OHV System

The general descriptions for Bear Creek, Gibson Prairie, LaDee Flats, McCubbins Gulch, Peavine, and Rock Creek are the same as Alternative 2. The legal descriptions for several areas differ. For Gibson Prairie, the legal description only includes T1N, R10E, Sections 1-2 and T1N, R11E, Section 6 for this alternative. For McCubbins Gulch, the legal description for the proposed routes is expanded to include R9E. For Rock Creek, the legal description is expanded to include T3S, R10E, Sections 17-18, 21-22, 29 and 34. The legal descriptions for Bear Creek, LaDee Flats and Peavine are the same as Alternative 2. See Appendix A for maps of each of these six proposed OHV systems for Alternative 3. A general description and location for Graham Pass and Mount Defiance each are as follows.

Graham Pass: This proposed OHV system is located at the southern end of the Forest, along Rhododendron Ridge, which separates the Collawash River watershed from the upper Clackamas River watershed. The location is 12 miles northeast of the town of Detroit, in Clackamas and Marion Counties on the Clackamas River Ranger District and is accessed by the 46 and 63 road systems. The legal description for the proposed routes is T7-9S, R7E in Clackamas County, Oregon (see Appendix A, Alternative 3 OHV Proposal Graham Pass Map).

Elevations range from 2800 feet to 5200 feet. This system is located within the Collawash River and Upper Clackamas River fifth field watersheds. Major streams in the general area include Clackamas River, Hunter Creek, Collawash River, Berry Creek, Rhododendron Creek and Lowe Creek. This analysis area is very similar to Peavine with gentle rounded slopes; glaciated, sandy and rocky soils with high infiltration. The area historically had a fair amount of big game utilization. The general forested area includes westside lowland conifer and montane mixed conifer habitat types.

Mount Defiance: The proposed OHV system is located on the eastern slopes of Mt. Defiance. The location is on the Hood River Ranger District approximately eight miles west of Hood River in Hood River County. The OHV system is accessed by 2820 Road. The legal description for the proposed routes is T2N, R9E, Sections 16, 21, and 28-29 in Hood River County, Oregon (see Appendix A, Alternative 3 OHV Proposal Mount Defiance Map).

Elevations range from 3000 feet to 4200 feet. This system is located within the Hood River and West Fork Hood River fifth field watersheds. The major stream in the area is Ditch Creek. This analysis area contains extremely rocky soils. The area is Montane mixed conifer and is mostly summer range for deer and elk and contains no winter range.

Proposed OHV Systems

For each location, a system of OHV routes was proposed as summarized in Table 2-15. Similar to Alternative 2, new motorized trail construction and convert to trails routes would be open to non-motorized users as well. The types of routes and classes of OHV are described under the description of Alternative 2 – Proposed Action. All roads that are proposed as motorized mixed use or converted to OHV trail are shown in Appendix F – Alternative 3 Road Data. The roads proposed to be decommissioned are summarized in Table 2-16 and the user-created trails are estimated in Table 2-17.

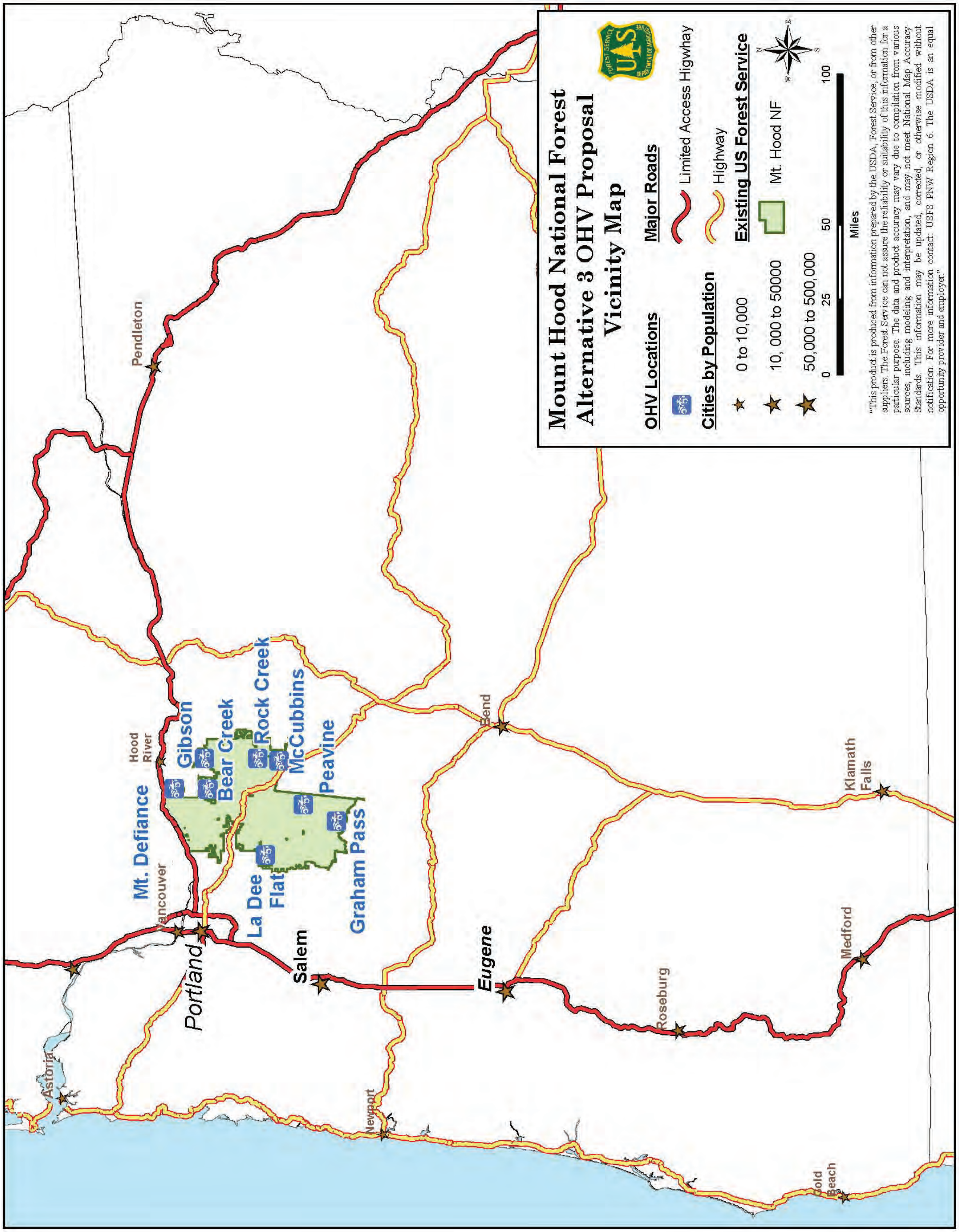


Figure 2-2. Vicinity Map for Alternative 3.

Table 2-15. Miles of OHV routes proposed by class for each system in Alternative 3.

OHV System	OHV Class	Road Routes (miles)		Trail Routes (miles)		Total Route Miles by Location
		Convert to Trail	Motorized Mixed Use	Existing Trails	New Trail Construction	
Bear Creek	Class III	3	7.5	0	28.8	39.3
Gibson Prairie	Class I and III	0.1	4.5	0	0.3	4.9
Graham Pass	Class I, II, and III	0	50.6	0	0	63.2
	Class III	0	2.2	10.4	0	
LaDee Flats	Class I, II, and III	4.3	17.9	0	0.3	42.0
	Class I and III	14.5	0	0	5	
	Class II	0	0	0	0	
McCubbins Gulch	Class I and III	7.3	3.2	25.6	0.7	60.1
	Class III	9.9	0	0	13.4	
Mt. Defiance	Class I and III	0	5.5	0	0	5.5
Peavine	Class I and III	28.9	11.6	0.2	8.9	49.6
Rock Creek	Class I and III	25.9	26.6	2.1	6.6	61.2
Total Miles		**94**	**130**	**38**	**64**	**326**

Table 2-16. Miles of roads to be decommissioned in Alternative 3.

OHV System	Miles
Bear Creek	0.4
Gibson Prairie	0.0
Graham Pass	0.0
LaDee Flats	5.2
McCubbins Gulch	7.9
Mt. Defiance	0.0
Peavine	16.9
Rock Creek	4.3
Total Miles	**35**

Table 2-17. Miles of new trail construction, including estimated mileage of user-created trails, for Alternative 3.

OHV System	User-created Trails	New Trail Construction
Bear Creek	0.6	28.2
Gibson Prairie	0.0	0.3
Graham Pass	0.0	0.0
LaDee Flats	0.2	5.1
McCubbins Gulch	3.1	11.0
Mount Defiance	0.0	0.0
Peavine	0.1	8.8
Rock Creek	0.8	5.8
Totals	4.8	59.2
Grand Total	**64.0**	

Six proposed systems include a staging area as shown in Table 2-18. The Gibson Prairie and Mount Defiance proposed OHV systems do not include a staging area. Staging areas for these areas are provided by Hood River County in the adjoining OHV systems. All staging areas would allow dispersed camping and would serve as a trailhead for motorized recreation. McCubbins Gulch Campground would continue to be the staging area for this OHV location and would be the only developed campground. No improvements are proposed to any staging areas, except potentially a bathroom facility as required by PDC RM-7. In this alternative, there are no restrictions on OHV trails or use. All OHV riders must follow State laws, including the use of headlights.

Table 2-18. Proposed staging areas for Alternative 3.

OHV System	Site Description	Legal Description	Size (Acres)	Parking Capacity
Bear Creek	Storage Pit, Road 16	T1S, R9E, Sec 9, NE1/4	0.4	11
	Storage Pit, Road 1610	T1S, R9E, Sec 10, NW1/4	0.4	9
Gibson Prairie	No Staging Area			
Graham Pass	Lowe Creek Pit	T7S, R7E, Sec 9, SE1/4	1.4	43
LaDee Flats	No Whisky Timber Sale Landing	T4S, R5E, Sec 20, NE1/4	1.0	30
	Round Wolf Pit	T5S, R7E, Sec 1, NE1/4	2.2	64
McCubbins Gulch	McCubbins Campground	T5S, R10E, Sec 24, SW1/4	8.0	20
	McCubbins Day-Use Site	T5S, R10E, Sec 17, SE1/4	0.8	27
	Path Timber Sale Landing	T5S, R10E, Sec 24, NW1/4	1.1	32
Mt. Defiance	No Staging Area			
Peavine	Devil's Ridge Quarry	T6S, R8E, Sec 19, SE1/4	3.2	97
Rock Creek	Post Point Quarry	T4S, R10E, Sec 26, NE1/4	4.1	130
Total Area/Capacity Across Forest			**23**	**463**

Alternative 3 includes two additional components similar to Alternative 2. First, Alternative 2 includes one small OHV area (North Fork Quarry) in the LaDee Flats location. This proposed OHV area is approximately four acres in size and is currently used by OHVs. This OHV area is in a disturbed rock quarry. The quarry is located on Road 4610-120. The legal description is T4S, R6E, Section 19, NE ¼, SE ¼. OHVs would not be permitted outside the North Fork Quarry OHV area. All staging areas and proposed OHV area are within rock quarries that may be needed for future management activities. PDC RD-6 states: "Allow temporary suspension of use of staging areas and designated OHV area, if necessary, where located in rock sources while rock resource operations are conducted" to avoid any conflicts.

Second, Alternative 2 would create a day-use area within the general area of the Rock Creek location. This area imposes restrictions on campfires and overnight occupancy in a 3,533 acre area adjacent to Gate Creek Ditch in the vicinity of the Sportsman's Park community. The proposed day-use area overlays the Wildland-Urban Interface (WUI) for Sportsman's Park, as defined by Wasco County.

As directed by PDC O-2 through O-7, the proposed OHV routes and staging areas in the Peavine, Gibson Prairie, McCubbins Gulch, Rock Creek, Bear Creek, and Mount Defiance areas would be closed for part of the year.

- Peavine designated OHV routes would be closed to protect deer and elk winter range and habitat during deer and elk calving season, and to prevent erosion from December 1 to June 15 (PDC O-2).
- Gibson Prairie designated OHV routes would be closed to protect deer and elk winter range, and habitat during deer and elk calving season from November 1 to June 15 (PDC O-3).

- McCubbins Gulch and Rock Creek designated OHV routes would be closed to protect deer and elk winter range from December 1 to April 1 (PDC O-4).
- Bear Creek designated routes would be closed to prevent soil sedimentation on native trails from November 1 to June 1. No new construction would occur in Bear Creek from November 1 to June 1 to prevent erosion (PDC O-5).
- Mount Defiance designated routes would be closed to protect deer and elk winter range from December 1 to May 15 (PDC O-7).

The general forest area would remain the same as described in Alternative 2. Similar to Alternative 2, all designated routes would be depicted on the MVUM. The MVUM would be the new enforcement tool; all motorized recreationalists would need to consult the map to determine what routes are open. Routes would no longer be required to be posted as closed.

Land Use Allocations

As described in Section 1.6 Land Use Allocations, the proposed routes cross through a variety of Forest Plan Land Use Allocations and Northwest Forest Plan Land Use Allocations. Table 2-19 lists the LUAs for the eight proposed OHV systems. The majority of roads (68 percent) and trails (73 percent) are located on C1-Timber Emphasis Lands. For roads, an additional seven percent are located in B11-Deer and Elk Summer Range and eight percent in B2-Scenic Viewshed. For trails, an additional ten percent are located on B10-Deer and Elk Winter Range and nine percent are located on B2-Scenic Viewshed. Less than five percent of the remaining miles of roads and trails are located in the other LUAs.

Similar to Alternative 2, the Forest Plan Standards and Guidelines for the A4-Special Interest Areas, A9-Key Site Riparian, and B6-Special Emphasis Watershed discourage or prohibit OHV use. The roads and trails included in this alternative are all existing motorized routes on the Forest. This includes 1.7 miles of roads on A4 lands; 0.4 miles of roads on A9 lands; and 11.3 miles of road and 4.9 miles of trail on B6 lands. No new OHV trail construction would be permitted in these LUAs.

Table 2-19. Forest Plan land use allocations for Alternative 3.

Land Use Allocation	Miles of Roads [1]	Miles of Trails	Total Miles
Bear Creek OHV System			
B6-Special Emphasis Watershed	0.0	0.4	0.4
C1-Timber Emphasis	10.5	28.4	38.8
Gibson Prairie OHV System			
B10-Deer and Elk Winter Range	0.2	0.0	0.2
C1-Timber Emphasis	4.3	0.3	4.6
Graham Pass OHV System			
A9-Key Site Riparian	0.2	0.0	0.2
B2-Scenic Viewshed	3.8	0.0	3.8
B6-Special Emphasis Watershed	11.3	4.5	15.8
B8-Earthflow Area	0.5	0.0	0.5
B11-Deer and Elk Summer Range	9.0	3.5	12.6
B12-Backcountry Lakes	0.5	0.0	0.5
C1-Timber Emphasis	27.5	2.4	29.9
LaDee Flats OHV System			
A4-Special Interest Area	1.7	0.0	1.7
A9-Key Site Riparian Area [2]	0.2	0.0	0.2
B2-Scenic Viewshed	1.4	0.0	1.4
B3-Roaded Recreation	10.6	0.0	10.6
C1-Timber Emphasis	22.9	5.3	28.2

Table 2-19. (continued)

Land Use Allocation	Miles of Roads [1]	Miles of Trails	Total Miles
McCubbins Gulch OHV System			
A1-Wild, Scenic and Recreational Rivers – White River	0.0	0.4	0.4
B2-Scenic Viewshed	4.1	5.1	9.2
B10-Deer and Elk Winter Range	4.0	9.7	13.7
C1-Timber Emphasis	12.3	24.5	36.8
Mt. Defiance OHV System			
C1-Timber Emphasis	5.5	0.0	5.5
Peavine OHV System			
B2-Scenic Viewshed	6.4	2.6	9.0
B11-Deer and Elk Summer Range	7.7	0.0	7.7
C1-Timber Emphasis	26.4	6.5	32.9
Rock Creek OHV System			
A6-Semi-Primitive Roaded Recreation	4.3	0.0	4.3
B2-Scenic Viewshed	2.2	1.4	3.6
B4-Pine/Oak (Wildlife Emphasis)	3.6	0.3	3.9
C1-Timber Emphasis	42.5	7.0	49.5
GRAND TOTAL	**223**	**102**	**326**

1 - Decommissioned roads are not included
2 - Existing road located on the boundary of A9 lands

Table 2-20 lists the Northwest Forest Plan Land Use Allocations for proposed OHV systems. Overall, 92 percent of the proposed routes are located on Matrix lands. Seven percent are located in Late-Successional Reserves (LSR). Approximately 4.2 miles of an existing road within an administratively withdrawn area is included in this alternative.

Table 2-20. Northwest Forest Plan land use allocations for Alternative 3.

Land Use Allocation	Miles of Roads [1]	Miles of Trails	Total Miles
Bear Creek OHV System			
Matrix	10.5	28.8	39.3
Gibson Prairie OHV System			
Matrix	4.6	0.3	4.9
Graham Pass OHV System			
Matrix	52.8	10.4	63.2
LaDee Flats OHV System			
Late Successional Reserve	13.8	0.2	14.0
Matrix	22.9	5.1	28.0
McCubbins Gulch OHV System			
Late Successional Reserve	3.3	4.6	7.9
Matrix	17.1	35.1	52.2
Mt. Defiance OHV System			
Matrix	5.5	0.0	5.5
Peavine OHV System			
Late Successional Reserve	0.3	0.0	0.3
Matrix	40.2	9.1	49.3

Land Use Allocation	Miles of Roads [1]	Miles of Trails	Total Miles
Rock Creek OHV System			
Administratively Withdrawn [2]	4.2	0.0	4.2
Late Successional Reserve	0.8	0.0	0.8
Matrix	47.5	8.7	56.2
GRAND TOTAL	**224**	**102**	**326**

1 - Decommissioned roads are not included
2 - Existing routes located in Administratively Withdrawn Area

In addition to these Northwest Forest Plan LUAs, proposed OHV routes are found within riparian reserves, which overlap these allocations, as shown in Table 2-21. Approximately 10 percent of the proposed OHV routes are located within riparian reserves. The effects of proposed OHV routes within these riparian reserves are discussed in Section 3.3 Hydrology and Section 3.4 Fisheries.

Table 2-21. Proposed OHV routes within Riparian Reserves for Alternative 3.

OHV System	Miles of Roads [1]	Percent All Roads	Miles of Trails	Percent All Trails	Total Miles	Percent All Routes
Bear Creek	0.7	6.7%	0.4	1.4%	1.1	2.8%
Gibson Prairie	0.9	20.0%	0.0	0.0%	0.9	18.8%
Graham Pass	10.7	20.3%	0.4	3.8%	11.1	17.6%
LaDee Flats	4.2	11.4%	0.0	0.0%	4.2	10.0%
McCubbins Gulch	2.0	9.8%	4.0	10.1%	6.0	10.0%
Mt. Defiance	0.2	3.6%	0.0	0.0%	0.2	3.6%
Peavine	5.8	14.3%	0.8	8.8%	6.6	13.3%
Rock Creek	3.5	6.7%	0.4	4.6%	3.9	6.4%
Total	**28.0**	**12.6%**	**6.0**	**5.9%**	**34.0**	**10.4%**

1 - Decommissioned roads are not included

Forest Plan Amendment

Alternative 3 includes a Forest Plan Amendment incorporating the 20 standards and guidelines that do not comply with the Final Travel Management Rule. These are described under Alternative 2 and Table 2-13. This amendment limits OHV use to designated routes, prohibits cross-country travel by OHVs, replaces the enforcement tool to the MVUM, and removes the requirement to post areas or roads as closed to OHV use.

In addition, the proposed Forest Plan Amendment for Alternative 3 includes two additional standard and guidelines that prohibit OHV use on existing roads and trails (A4-039 andA9-039). The proposed amendment (Table 2-22) would allow historic OHV use to continue on existing roads and trails. No new trail construction would be permitted in these Land Use Allocations. Section 3.16 Forest Plan Amendment analyzes the significance of this amendment.

After implementation of this Forest Plan Amendment, only designated routes would be available for OHV use. All other roads, trails, and areas would be closed to OHV use, unless additional NEPA analysis is completed. This would be Amendment #17 to the Forest Plan.

Table 2-22. Additional proposed standards and guidelines for Forest Plan Amendment #17 for Alternative 3. Suggested changes are italic or strikethrough print. The proposed changes allow OHV to continue using existing roads and trails; no new OHV trail construction would be permitted.

STANDARD	PAGE	STANDARD AND GUIDELINE	PROPOSED AMENDMENT
A4-039 Special Interest Area	4-156	Off-road vehicle uses in powerline rights-of-way should be allowed where consistent with other management direction, e.g. riparian and cultural resources protection.	~~Off-road vehicle uses in powerline rights-of-way should be allowed where consistent with other management direction, e.g. riparian and cultural resources protection.~~ *Off-road motorized vehicle use shall not be permitted except on designated routes.*
A9-039 Key Site Riparian	4-184	Recreation off-road vehicle use, except over-snow vehicles, shall be prohibited.	~~Recreation off-road vehicle use, except over-snow vehicles, shall be prohibited.~~ *Off-road motorized vehicle use shall not be permitted except on designated routes. Only existing roads or trails shall be designated.*

2.3.4. Alternative 4

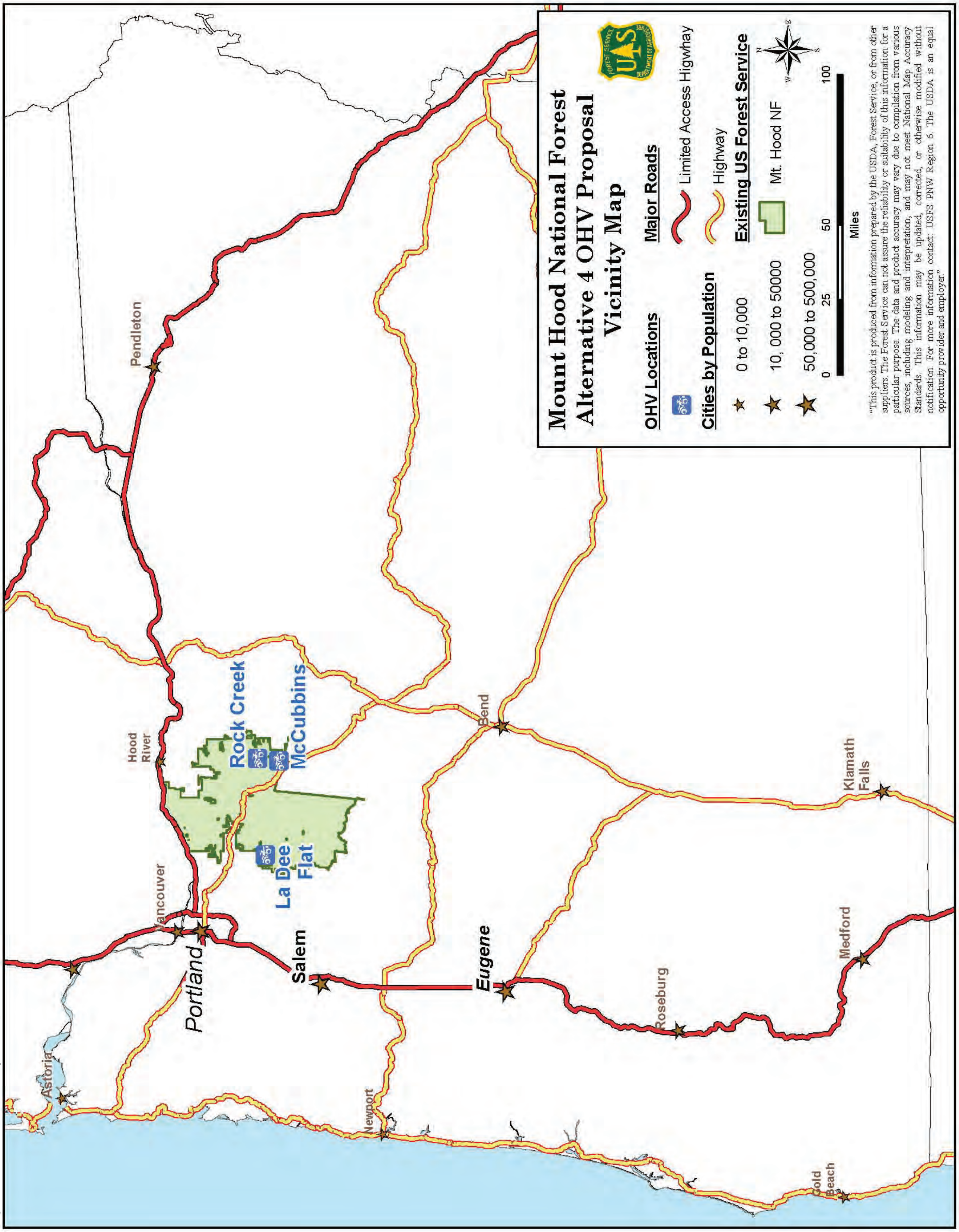
Similar to the Proposed Action and Alternative 3, Alternative 4 would change OHV access through much of the Forest. This alternative considered all scoping comments and government-to-government consultation that recommended dropping a proposed OHV system or reducing the number of routes within a proposed system. The following changes were incorporated into this alternative.

- The Bear Creek proposed OHV system is dropped from this alternative to minimize the environmental effects associated with new construction.
- The Gibson Prairie proposed OHV system was dropped from this alternative to address wildlife concerns as well as concerns associated with the previous illegal trail construction. Dropping this proposed system also eliminates any potential user conflicts with the Long Prairie Range Allocation permittee.
- The Abbott Road section of the LaDee Flats proposed OHV system is eliminated from this alternative to address concerns associated with managing the transportation system and providing adequate law enforcement coverage.
- The McCubbins Gulch proposed OHV system does not include the single-track trails to the west and modifies the Proposed Action to "clean up" some user-created routes. This alternative does not include any motorized mixed-use on paved roads.
- The Peavine proposed OHV system was dropped from this alternative to address potential fisheries and wildlife effects as well as concerns associated with the proximity to the Pacific Crest Trail.
- All routes within the WUI portion of the Rock Creek proposed OHV system were dropped from this alternative, including an access route from Sportsman's Park.
- No additional locations were included in this alternative.

This alternative reduces the OHV routes included in the LaDee Flats and McCubbins Gulch proposed OHV systems and eliminates all OHV use in the Bear Creek, Gibson Prairie, Graham Pass, Mount Defiance, and Peavine proposed systems. Figure 2-3 is a vicinity map for the three locations proposed in Alternative 4. Overall, Alternative 4 allows OHV use on 59 miles of roads and 40 miles of trails. After the Record of Decision is signed for this project, the Final Travel Management Rule would require all OHVs to remain on these designated routes and area, and no OHV cross-country travel would be permitted. OHVs would be permitted only on the routes and areas designated by the selected alternative.

The three locations considered in Alternative 4 are: LaDee Flats, McCubbins Gulch and Rock Creek (see Appendix A, Alternative 4 OHV Proposal Overview Map). Each of the proposed systems and components of Alternative 4 are discussed in the following sections. The components include: general description, proposed OHV systems, land use allocations, and Forest Plan Amendment.

Figure 2-3. Vicinity Map for Alternative 4.



General Description and Location of each Proposed OHV System

The general descriptions for LaDee Flats, McCubbins Gulch and Rock Creek are the same as Alternative 2. The legal descriptions for McCubbins Gulch and Rock Creek are the same as Alternative 2. For LaDee Flats, the legal description for the proposed routes only includes T4S, R5-6E and T4S, R7E, Section 18. None of the other proposed OHV systems described in the previous alternatives are included in Alternative 4. See Appendix A for maps of each of these three proposed OHV systems for Alternative 4.

Proposed OHV Systems

For each of the proposed systems, a system of OHV routes was proposed as summarized in Table 2-23. Similar to Alternative 2, new motorized trail construction and convert to trails routes would be open to non-motorized users as well. The types of routes and classes of OHV are described under the description of Alternative 2 – Proposed Action. All roads that are proposed as motorized mixed use or converted to OHV trail are shown in Appendix G – Alternative 4 Road Data. The proposed decommissioned roads are summarized in Table 2-24 and the user-created trails are estimated in Table 2-25.

Table 2-23. Miles of OHV routes proposed by class for each system in Alternative 4.

OHV System	OHV Class	Road Routes (miles)		Trail Routes (miles)		Total Route Miles by Location
		Convert to Trail	Motorized Mixed Use	Existing Trails	New Trail Construction	
LaDee Flats	Class I, II, and III	4.2	9.2	0	0.1	25.2
	Class I and III	6.7	0	0	5	
McCubbins Gulch	Class I and III	7.3	0	25.6	0.7	33.6
Rock Creek	Class I and III	15.1	16.9	2.1	3.2	37.3
Total Miles		**33**	**26**	**28**	**9**	**96**

Table 2-24. Miles of roads to be decommissioned in Alternative 4.

OHV Location	Miles
LaDee Flats	5.1
McCubbins Gulch	5.4
Rock Creek	1.9
Total Miles	**12**

Table 2-25. Miles of new trail construction, including estimated mileage of user-created trails.

OHV System	User-created Trails	New Trail Construction
LaDee Flats	0.2	4.9
McCubbins Gulch	0.0	0.7
Rock Creek	0.2	3.0
Totals	0.4	8.6
Grand Total	**9.0**	

All proposed systems include a staging area as shown in Table 2-26. Staging areas would serve as a trailhead for motorized recreation and would not allow dispersed camping. McCubbins Gulch Campground would continue to be the staging area for this OHV location and would be the only developed campground. No improvements are proposed to any staging areas, except potentially a bathroom facility as required by PDC RM-7. In this alternative, OHV trails would only be open during daylight hours. All OHV must follow State laws.

Table 2-26. Proposed staging areas for Alternative 4.

OHV System	Site Description	Legal Description	Size (Acres)	Parking Capacity
LaDee Flats	No Whisky Timber Sale Landing	T4S, R5E, Sec 20, NE1/4	1.0	30
McCubbins Gulch	McCubbins Campground	T5S, R10E, Sec 24, SW1/4	8.0	20
	McCubbins Day-Use Site	T5S, R10E, Sec 17, SE1/4	0.8	27
	Path Timber Sale Landing	T5S, R10E, Sec 24, NW1/4	1.1	32
Rock Creek	Post Point Quarry	T4S, R10E, Sec 26, NE1/4	4.1	130
Total Area/Capacity Across Forest			**15**	**239**

In addition to these proposed routes and staging areas, Alternative 4 includes one small OHV area (North Fork Quarry) in the LaDee Flats OHV system. This proposed OHV area is approximately four acres in size and is currently used by OHVs. The quarry is located on Road 4610-120. The legal description is T4S, R6E, Section 19, NE ¼, SE ¼. OHVs would not be permitted outside of this area or designated routes. As directed by PDC O-4, the McCubbins Gulch and Rock Creek proposed OHV routes and staging areas would be closed from December 1 to April 1. All staging areas and proposed OHV area are within rock quarries that may be needed for future management activities. PDC RD-6 states: "Allow temporary suspension of use of staging areas and designated OHV area, if necessary, where located in rock sources while rock resource operations are conducted" to avoid any conflicts.

The general forest area would remain the same as described in Alternative 2. Similar to Alternative 2, all proposed routes would be depicted on the MVUM. The MVUM would be the new enforcement tool; all motorized recreationalists would need to consult the map to determine what routes are open. Routes would no longer be required to be posted as closed.

Land Use Allocations

As described in Section 1.6 Land Use Allocations, the proposed routes cross through a variety of Forest Plan Land Use Allocations and Northwest Forest Plan Land Use Allocations. Table 2-27 lists the LUAs for the three proposed OHV systems. The majority of roads (95 percent) and trails (87 percent) are located on C1-Timber Emphasis Lands. For roads, the remaining five percent are located in B2-Scenic Viewshed. For trails, an additional six percent are located on B2-Scenic Viewshed. Less than one percent of the remaining miles of roads and trails are located in the other LUAs.

Similar to Alternative 2, the Forest Plan Standards and Guidelines for the A9-Key Site Riparian, discourage or prohibit OHV use. Approximately 0.2 miles of road on A9 lands is included in the LaDee Flats location. These are existing roads on the boundary of the LUA. Since LUAs are not buffered, motorized use is permitted on this road.

Table 2-27. Forest Plan land use allocations for Alternative 4.

Land Use Allocation	Miles of Roads [1]	Miles of Trails	Total Miles
LaDee Flats OHV System			
A9-Key Site Riparian Area 2	0.2	0.0	0.2
B2-Scenic Viewshed	1.4	0.0	1.4
C1-Timber Emphasis	18.5	5.0	23.6
McCubbins Gulch OHV System			
A1-Wild, Scenic and Recreational Rivers – White River	0.0	0.4	0.4
B2-Scenic Viewshed	0.9	2.6	3.5
B10-Deer and Elk Winter Range	0.1	1.2	1.4
C1-Timber Emphasis	6.3	22.0	28.3
Rock Creek OHV System			
B2-Scenic Viewshed	0.8	0.3	1.1
C1-Timber Emphasis	31.1	5.0	36.0
GRAND TOTAL	**59**	**37**	**96**

1 - Decommissioned roads are not included
2 - Existing road located on the boundary of A9 lands

Table 2-28 lists the Northwest Forest Plan Land Use Allocations for the three proposed systems. Overall, 93 percent of the proposed routes are located on Matrix lands. Seven percent are located in Late-Successional Reserves (LSR). Approximately 0.1 miles of an existing road within an administratively withdrawn area is included in this alternative.

Table 2-28. Northwest Forest Plan land use allocations for Alternative 4.

Land Use Allocation	Miles of Roads 1	Miles of Trails	Total Miles
LaDee Flats OHV System			
Late Successional Reserve	0.2	0.0	0.2
Matrix	19.9	5.1	25.0
McCubbins Gulch OHV System			
Late Successional Reserve	2.4	4.1	6.5
Matrix	4.9	22.2	27.1
Rock Creek OHV System			
Administratively Withdrawn 2	0.1	0.0	0.1
Matrix	31.9	5.3	37.2
GRAND TOTAL	**59**	**37**	**96**

1 - Decommissioned roads are not included
2 - Existing routes located in Administratively Withdrawn Area

In addition to these Northwest Forest Plan LUAs, proposed OHV routes are found within riparian reserves, which overlap these allocations, as shown in Table 2-29. Approximately eight percent of the proposed OHV routes are located within riparian reserves. The effects of proposed OHV routes within these riparian reserves are discussed in Section 3.3 Hydrology and Section 3.4 Fisheries.

Table 2-29. Proposed OHV routes within Riparian Reserves for Alternative 4.

OHV Location	Miles of Roads [1]	Percent All Roads	Miles of Trails	Percent All Trails	Total Miles	Percent All Routes
LaDee Flats	2.9	14.2%	0.0	0.0%	2.9	11.3%
McCubbins Gulch	1.5	20.4%	1.9	7.2%	3.4	10.1%
Rock Creek	2.0	6.2%	0.1	1.9%	2.1	5.6%
Total	**6.3**	**10.6%**	**2.0**	**5.4%**	**8.3**	**8.6%**

1 - Decommissioned roads are not included

Forest Plan Amendment

Alternative 4 includes a Forest Plan Amendment incorporating the 20 standards and guidelines that do not comply with the Final Travel Management Rule. These are described under Alternative 2 and Table 2-13. This amendment limits OHV use to designated routes, prohibits cross-country travel by OHVs, replaces the enforcement tool to the MVUM, and removes the requirement to post areas or roads as closed to OHV use. Section 3.16 Forest Plan Amendment analyzes the significance of this amendment.

After implementation of this Forest Plan Amendment, only designated routes would be available for OHV use. All other roads, trails, and areas would be closed to OHV use, unless additional NEPA analysis is completed. This would be Amendment #17 to the Forest Plan.

2.4. Project Design Criteria

Project design criteria (PDC) were developed to reduce or eliminate potential impacts off-highway vehicles (OHV) may cause. PDC define a set of conditions or requirements that an activity must meet to avoid or minimize potential effects on sensitive resources. All PDC are required for both all action alternatives. PDC are not optional and are incorporated in the effects analysis.

OHV Routes (Seasonal Restrictions, Rerouting)

O-1: Roads converted to trails would be designated as OHV trails and maintained to trail standards, rather than road standards.

O-2: Peavine designated routes would be closed to protect deer and elk winter range and habitat during deer and elk calving season, and to prevent erosion from December 1 to June 15.

O-3: Gibson Prairie designated routes would be closed to protect deer and elk winter range, and habitat during deer and elk calving season from November 1 to June 15.

O-4: McCubbins Gulch and Rock Creek designated routes would be closed to protect deer and elk winter range from December 1 to April 1.

O-5: Bear Creek designated routes would be closed to prevent soil sedimentation on native trails from November 1 to June 1. No new construction would occur in Bear Creek from November 1 to June 1 to prevent erosion.

O-6: New construction in Bear Creek would avoid talus slopes in order to protect heritage resource sites and habitat for sensitive salamander species.

O-7: Mount Defiance designated routes would be closed to protect deer and elk winter range from December 1 to May 15.

Recreation Management

RM-1: Develop and implement a sign plan for all designated OHV routes that includes measures to mitigate motorized-mixed use on forest roads. Post signs on designated OHV routes indicating appropriate vehicle classes.

RM-2: Feature loop routes, and minimize dead end routes during route design.

RM-3: Design and build trails to standard using guidelines from the Forest Service Handbook 2309.18, Trails Management. These guidelines provide for visitor safety and help prevent resource damage.

RM-4: Use curvilinear design for new trails to decrease rider speed, increase user interest and challenge, and minimize the number of trees to be removed during construction.

RM-5: Locate new trails in ways that discourage and minimize off-trail travel access.

RM-6: Where feasible, utilize existing openings for staging areas.

RM-7: Provide restroom facilities, as usage warrants, at designated OHV staging areas.

RM-8: Target shooting is prohibited in all OHV staging areas.

RM-9: OHV trails are open to other (non-motorized) trail users unless posted otherwise.

RM-10: ATV stickers are required for all Class I, II and III OHV on designated National Forest routes.

Roads

RD-1: All motorized mixed-use roads within the designated OHV locations should be signed to notify the user that there are OHV using the route and that all users must "share the road."

RD-2: Routes should be maintained to provide the appropriate stopping sight distance based on posted speed limit or prevailing speed within the designated OHV locations.

RD-3: The Forest Service may restrict OHV access and/or commercial use on routes to reduce risks during commercial haul or Special Events.

RD-4: Encourage the daytime use of headlights/taillights, if so equipped, in all areas.

RD-5: Planned road/trail intersections would be located based on site-specific examination for risk. Existing road/trail intersections should be analyzed for safety and appropriate action taken.

RD-6: Allow temporary suspension of use of staging areas and designated OHV area, if necessary, where located in rock sources while rock resource operations are conducted.

RD-7: All roads proposed to be closed to all traffic would be actively obliterated[5] within sight distance from the designated OHV route. The remaining length of decommissioned road should be left in hydrologically stable condition. Actions to achieve hydrologic stability could include, but are not limited to, culvert removal, water bar, and ditch cleaning.

RD-8: Decommission the following roads within the Bear Creek location under Alternatives 2 and 3: 1630-620, 1630-630, 1630-640, 1630-650, and 1630-660.

5 Road obliteration would be done using active (i.e., mechanical) methods. Active obliteration would require work, such as slope rehabilitation and culvert removal. Any drainage structures to be removed or treated, such as culverts, bridges, or fords, must be accomplished in such a way that restores natural drainage. Additionally, a barrier closure device or feature (i.e., berm, gate, or guardrail) may be constructed at the beginning to deter vehicle access.

RD-9: For the Bear Creek designated routes, remove all culverts and maintain the trail standards for all roads proposed to be converted to OHV trails (Alternative 3).

RD-10: Fish passage barrier culverts on roads proposed to be closed should be removed.

RD-11: Review individual Motorized Mixed Use Reports for identified site specific hazards and recommendations prior to implementation, and implement the measures as appropriate.

Law Enforcement

LE-1: Forest Service Law Enforcement should coordinate with County Sheriffs' Offices that currently receive state OHV funding to plan for OHV emphasis patrols.

LE-2: Plan and schedule for increased patrols during high use periods that can be utilized and implemented by Forest staff.

LE-3: Employees and equipment should be readily identifiable as Forest Service personnel and equipment to provide for compliance and violation prevention efforts.

LE-4: Increase public awareness of designated OHV routes through field contacts with forest visitors.

LE-5: Coordinate volunteers with Forest employees for OHV emphasis patrols on All Terrain Vehicles (ATV), motorcycles, and/or 4X4 trucks.

Public Awareness and Education

EDU-1: Maintain the Forest web page with OHV information including the most current version of the MVUM.

EDU-2: Annually update the MVUM incorporating information from the public and changes in resource conditions.

EDU-3: Use interpretive signing at trailheads or staging areas, meet/make presentations to OHV clubs and other user groups, and publish/distributes brochures, as appropriate, to promote heritage resource protection goals.

EDU-4: A contact number for spills of hazardous materials would be provided in OHV educations pamphlets and education signs at staging areas. Preventing spills and contamination would be included into the rider education program.

EDU-5: In accordance with the Mt. Hood National Forest Invasive Plant Prevention Measures, develop and distribute informational materials at key locations (e.g., campgrounds, picnic areas, parking lot/staging areas, trailheads, boat launches, Visitor Centers, and District Offices). \Information should include "tips" for recreation users on ways to minimize the risk of introducing or spreading invasive plants, and a contact name or agency.

Wildlife Management

WM-1: Trail construction and maintenance (activities requiring motorized equipment, i.e., chain saw use) should be restricted to avoid impacts to landbirds, elk, deer, and spotted owls, as determined by a qualified wildlife biologist.

WM-2: Avoid removing any trees with existing cavity nesting holes. Consider replacement of lost nesting habitat by installing artificial nesting habitat near the project area.

WM-3: If a raptor or Northern spotted owl nest is found, then OHV trail construction should minimize the loss of young birds.

WM-4: Trees felled for trail construction and maintenance would be retained in place, or near the site, for forest floor users. Down logs cut to open a trail would have the section of log remain on site and not sectioned if possible. Down logs would not be designated for firewood cutting.

Invasive Plants

IP-1: OHV routes and OHV staging areas would be managed for invasive plants according to the *Mt. Hood Site Specific Invasive Plant Treatment* Record of Decision and Final Environmental Impact Statement (2005).

IP-2: Use native species unless it can be shown that they would not successfully establish. The use of native plant materials should also extend to using nursery grown native shrub and tree seedlings and to making field transplants.

IP-3: No new trail construction would occur in the Bear Creek location until all existing invasive plant sites have been treated. Treatment would follow the *Mt. Hood Site Specific Invasive Plant Treatment Environmental Impact Statement* Record of Decision and Final Environmental Impact Statement (2005).

Soil and Erosion Control

S-1: When a road or trail section is realigned, the old route should be concurrently decommissioned and properly drained. Preventing future use of the abandoned route is a primary goal.

S-2: Route locations should take advantage of existing constructed features such as abandoned roads, utility corridors, and access roads to use previously disturbed areas.

S-3: A comprehensive erosion control plan should be developed and would include measures such as "Minimize soil erosion by controlling drainage and runoff; and by minimizing areas of cut and fill. Drainage structures should be constructed in fall so they are fully operational by the time wet weather arrives."

S-4: Monitor areas of cut and fill to identify any remaining stability problems that develop over time. Some sites may require additional level of erosion control. This would be an ongoing project and should be planned for early and often during the first snowmelt period following construction.

S-5: When using heavy equipment to build or maintain routes, use care to not blade fine materials off the road or trail. This creates the "berm" problems and the fine dirt is necessary for a usable tread.

S-6: In the LaDee Flats location, close sections not identified on trail system to allow native revegetation establishment.

S-7: Install appropriate erosion control measures in areas within at least 25 feet of stream crossings, wetlands, seeps and springs on designated OHV routes (roads and trails).

S-8: Salvage topsoil to an appropriate depth (usually about 6-inches) from construction sites (e.g., routes, parking lots) and stockpile for use in reclamation. Scarify compacted areas prior to re-vegetation efforts.

Water Resources

WR-1: All routes and staging areas should be located and designed to minimize erosion, sedimentation, and hazardous materials from leaching into surface waters. Minimize erosion from OHV routes by designing and maintaining proper drainage structures with adequate spacing of water bars especially before stream crossings.

WR-2: For construction related activities, fueling of gas-powered machinery should not occur within 150-feet of any live waters, without extra protective measures, to maintain water quality.

WR-3: If piling and burning are needed, then it should be done at least 100-feet away from surface water with as little disturbance as possible.

WR-4: Stream crossings on new construction or reconstruction routes should be designed to prevent the restriction of expected flood flows. Perennial streams should have bridge crossings. All new crossings over fish bearing streams should incorporate stream simulation designs.

WR-5: Establish fords only in stream segments that would not cause sedimentation or stream bank erosion. These conditions are generally where the stream channel is comprised of bedrock, boulders or cobbles and the bank slopes are low, dry, and stable. It may be necessary to harden approaches to minimize sedimentation and erosion. Fords would not be permitted in fish bearing or perennial streams.

WR-6: Minimize soil surface compaction and disturbance in Riparian Reserves. Only allow use of heavy construction equipment in this environment during periods when the soil is least susceptible to compaction or rutting.

WR-7: When possible, schedule construction activities within Riparian Reserves during dry periods or low water periods.

WR-8: Discourage off-trail OHV use in Riparian Reserves and at stream crossings by the use of barriers or other methods. Special emphasis should be given to Key Site Riparian areas.

WR-9: Existing road and trail crossings on fish bearing streams should be upgraded to provide unimpeded fish passage.

WR-10: All in-water OHV route construction and maintenance would occur during the appropriate Oregon Department of Fish and Wildlife (ODFW) in-water work window.

WR-11: Dispose of spoils/fill materials in stable areas and away from stream channels.

WR-12: Wetlands, seeps and springs should be avoided where possible during final trail location or when not possible utilize construction techniques to avoid resource damage.

Heritage Resources

HR-1: Significant heritage resources within the project Area of Potential Effects (APE) would be provided an appropriate degree of protection to preserve/conserve their values. Protection measures would be developed in consultation with the Oregon State Historic Preservation Officer (SHPO), appropriate Tribes, and, if necessary, the Advisory Council on Historic Preservation (ACHP).

HR-2: For proposed new construction, protection of heritage resources should avoid the site if possible. Travel routes with the potential to adversely affect significant heritage resources would be rerouted or realigned away from the resources. Distances would vary depending on the nature of the individual resource, local topography, and vegetation density.

HR-3: For prehistoric sites primarily characterized by surface exposures of lithic artifact material in an existing trail tread or wheel track, site "hardening" methods may be employed as a protective measure. Normally, geotextile fabric and fill would be used to stabilize eroding surfaces and exposed cultural deposits within site boundaries. Depth of fill would be determined by slope and soil conditions.

HR-4: To reduce threat of artifact theft and motorized vehicle damage to heritage resources adjacent to but outside designated travel routes, barricades and vegetative screening should be employed as a protective measure.

HR-5: Where avoidance or site hardening of heritage resources is not feasible, measures would be developed to reduce adverse effects. Such measures may include archaeological data recovery, and would be developed in consultation with SHPO, appropriate Tribes, and ACHP.

Wildland Fire

WF-1: Measures for reducing the potential for human-caused fires during elevated fire danger levels (High to Extreme) would be implemented (e.g., trail closures, campfire restrictions, increased signing).

WF-2: OHV would be compliant with State and Forest Service laws, regulation and standards. (e.g., spark arrestors).

Range

R-1: Install cattle guards or appropriate devices (avoid using non self-closing gates) where OHV trails cross range allotment fencing.

R-2: In the Gibson Prairie area, use signing and possibly temporary closures to make the OHV use in staging area compatible with livestock permittee equipment used (e.g., temporary livestock panels, gates and loading chute).

Road Decommissioning[6]:

DM-1: Ensure that an experienced professional fisheries biologist, hydrologist or technician is involved in the design of road decommissioning and/or culvert removal/replacement projects. The experience should be commensurate with technical requirements of a project.

DM-2: Follow the appropriate Oregon Department of Fish and Wildlife (ODFW) guidelines for timing of in-water work. Exceptions to the ODFW in-water work windows must be requested by the Forest or its contractors, and subsequently approved by ODFW.

DM-3: Project actions would follow all provisions and requirements (including permits) of the Clean Water Act for maintenance of water quality standards as described by the Oregon Department of Environmental Quality.

DM-4: All equipment used for restoration work shall be cleaned and leaks repaired prior to entering the project area. Remove external oil and grease, along with dirt, mud and plant parts prior to entering National Forest system lands. Thereafter, inspect equipment daily for leaks or accumulations of grease, and fix any identified problems before entering streams or areas that drain directly to streams or wetlands. This practice does not apply to service vehicles traveling frequently in and out of the project area that would remain on the roadway.

DM-5: Spill Prevention Control and Containment Plan (SPCCP) – The contractor would be required to have a written SPCCP, which describes measures to prevent or reduce impacts from potential spills (fuel, hydraulic fluid, etc). The SPCCP shall contain a description of the hazardous materials that would be used, including inventory, storage, handling procedures; a description of quick response containment supplies that would be available on the site (e.g., a silt fence, straw bales, and an oil-absorbing, floating boom whenever surface water is present.).

DM-6: All trucks used for refueling shall carry a hazardous material recovery kit, including absorbent pads to be used during refueling if that occurs in the project area. Any contaminated soil, vegetation or debris must be removed from National Forest System Lands and disposed of in accordance with state laws.

DM-7: Refuel mechanized equipment at least 150 feet from water bodies or as far as possible from the water body where local site conditions do not allow a 150-foot setback to prevent direct delivery of contaminants into water.

DM-8: Absorbent pads would be required under all stationary equipment and fuel storage containers.

6 These PDC apply only to the roads that will be actively decommissioned as part of this project.

DM-9: Dispose of slide and waste material in stable sites out of the flood prone area. Waste material other than hardened surface material (asphalt, concrete, etc) may be used to restore natural or near-natural contours.

DM-10: Trees that need to be felled during project implementation should be directionally felled, where feasible, away from the road prism and into the surrounding forest. Trees would not be bucked and would be left undisturbed to the extent possible.

DM-11: Prior to implementation of any road decommissioning, culvert removal, or culvert replacement invasive plant surveys should be performed at the project site(s). If any invasive plants are found on or near roads, the full extent of the invasion should be determined by surveying off road to the extent that it is reasonable to assume the invasive species may have spread. The invasive plant infestations should then be mapped and weed site reports completed. Depending upon the seriousness of the weed invasion, as determined by a trained botany or noxious weed coordinator, recommendations for treatment of the weed site(s) would be made and an updated Noxious Weed Risk Analysis and Mitigation Report would be prepared.

DM-12: Inspect active gravel, fill, sand stockpiles, quarry sites, and borrow material for invasive plants before use and transport. Treat or require treatment of infested sources before any use of pit material. Use only gravel, fill, sand, and rock that is judged to be weed free by District or Forest weed specialists.

DM-13: Place sediment barriers prior to construction around sites where significant levels of fine sediment may enter the stream directly or through road ditches. Maintain barriers throughout construction.

DM-14: For road decommissioning projects within riparian areas, re-contour the road prism to mimic natural floodplain contours and gradient to the greatest degree possible.

DM-15: Drainage features used for stormproofing projects should be spaced to disconnect road surface runoff from stream channels.

DM-16: Minimize disturbance of existing vegetation in ditches and at stream crossings to the greatest extent possible.

DM-17: Conduct activities during dry-field conditions—low to moderate soil moisture levels.

DM-18: Restore the stream channel and banks to original pre-road (natural) contours as much as possible when culverts are removed from the road prism.

DM-19: When removing a culvert from a non-fishing bearing stream, aquatic specialists shall determine if culvert removal should follow design criteria outlined below in the Culvert Replacement section. Culvert removal on fish bearing streams shall adhere to the Culvert Replacement design criteria.

Culvert Replacement:

C-1: Follow stream simulation design requirements for all new stream crossings (i.e. match, to the degree possible, stream width, slope, and substrate conditions with up and downstream conditions).

C-2: Rip Rap – The use of riprap is permissible above bankfull height to protect the inlet or outlet of new culverts or open-bottomed arches. If the use of riprap is required for culvert stability, then additional analysis may be required to ensure that the structure is not undersized. Riprap may only be placed below bankfull height when necessary for protection of abutments and pilings for bridges. However, the amount and placement of riprap around the abutments and/or pilings should not constrict the bankfull flow.

C-3: Grade Control Structures – Grade control structures are permitted to prevent headcutting above or below the culvert or bridge where natural channel re-grading is not desired. Grade control typically consists of boulder structures that are keyed into the banks, span the channel, and are buried in the substrate.

C-4: Road Dips – Where applicable, incorporate road dips into stream crossing design, to ensure catastrophic flood events would transport overflow back into the stream channel instead of onto the road bed.

C-5: Structures containing concrete must be cured or dried before they come into contact with stream flow.

C-6: When removing woody debris from the road-crossing inlet, place the debris downstream of the road crossing.

C-7: In streams where fish are present above and/or below the culvert a fish collection and removal procedure shall be implemented prior to dewatering (see below) and construction. The project area shall remain isolated using block nets or some other means during the construction period.

C-8: Dewater Construction Site: The preferred method for replacing a culvert involves dewatering the construction site to minimize impacts to water quality and fish populations. Upstream of the isolated construction area, divert flow around the construction site with a coffer dam (built with non-erosive materials) and an associated pump or a by-pass culvert. Pumps must have fish screens and be operated in accordance with NMFS fish screen criteria (NMFS 1995). Dissipate flow energy at the bypass outflow to prevent damage to riparian vegetation or stream channel. If diversion allows for downstream fish passage (i.e., is not screened), place diversion outlet in a location to promote safe reentry of fish into the stream channel, preferably into pool habitat with cover. When necessary, pump seepage water from the de-watered work area to a temporary storage and treatment site or into upland areas and allow water to filter through vegetation prior to reentering the stream channel.

C-9: Stream Re-watering: Upon project completion, slowly re-water the construction site to prevent loss of surface water downstream as the construction site streambed absorbs water and to prevent a sudden increase in stream turbidity. Monitor downstream during re-watering to prevent stranding of aquatic organisms below the construction site.

In addition to these PDC, additional measures may be taken by the Forest to prevent OHV from entering restricted areas and to prevent cross-country travel. For example, implementation of the proposed Palomar Pipeline project would include development of an OHV blocking plan to prevent OHV from travel along the proposed pipeline. The blocking plan would look at site-specific crossings to determine the best approach to prevent OHV use. Examples of methods that may be used include: boulders, berms, gates, visual marking, downed woody debris, and rough road access.

2.5. Monitoring Framework

Monitoring is critical for evaluating the effectiveness of management decisions and the accuracy of analysis assumptions and conclusions. Monitoring of road and trail conditions is required, and must meet regional and national standards. Forest Service Manual (FSM) directs Forest Supervisors to monitor all elements of the National Forest System transportation system to fulfill the objectives of forest transportation system established in FSM 7702 (FSM 7704.4). Also, the FSM 2355.04d directs Forest Supervisors to establish monitoring intervals and criteria, practices, sampling basis, and standards against which the effects of off-road vehicle use shall be evaluated and reported through the Forest planning and management review procedures.

Previous Monitoring

This proposed monitoring framework would replace the Off-road Vehicle (ORV) Use Monitoring Plan found in the Forest Plan (page 5-69 to 5-70). This would be part of the Forest Plan Amendment proposed for Alternatives 2, 3, and 4, and analyzed in Section 3.16. The Monitoring Plan adopted with the Forest Plan in 1990 poses the following evaluation questions regarding OHV use:

- *Are high quality OHV opportunities provided in areas which are suitable for OHV use and the needs, skills, and interest of users? Unit of measure is OHV RVDs (recreation visitor days).*

  For nearly two decades, the OHV policy in the Mt. Hood National Forest has afforded OHV access in areas which are suitable as well as areas which are unsuitable for OHV use and needs, skills and interests of users. Other than the limited findings of National Visitor Use Monitoring report (NVUM) (see Section 3.1.1, OHV Use in Mt. Hood National Forest for more information), no systematic measurement of OHV RVDs has been conducted. With minimal active management by the Forest Service (McCubbins Gulch is the only actively managed OHV system), users have sought out and concentrated OHV activities in locations that represent the optimum experiences in the Forest. Areas of interest to OHV enthusiasts are mostly (although not exclusively) represented by the six route systems in the proposed action.

- *Are the OHV opportunities provided effective in minimizing conflicts between user groups and safe for users and the general public? Unit of measure is the number and types of accidents and complaints.*

  No systematic Forest system exists for recording and tracking OHV accidents and complaints. County emergency services are the primary first responders to OHV accidents. Clackamas, Hood River and Wasco counties do not routinely report accidents to the Forest Service; however, Forest Service Law Enforcement Officers are usually aware and routinely respond to serious accidents with the counties. The concentrated-use area with the highest anecdotal account of accidents is west of Rock Creek Reservoir in Wasco County. Most accidents involve only a single OHV.

- *Are OHV opportunities being located, designed, and managed to minimize the negative effects (within acceptable limits) on key fish and wildlife species and sensitive habitats? Measurement is specific to species or habitat selected.*

  In the past two decades, OHV management on the Forest has been mostly reactive rather than proactive. Actions have primarily been exclusionary in nature, restricting motorized access in localized geographic areas where there has been actual or threatened harm to key fish and wildlife species and sensitive habitats from OHV use. Old Maid Flat, Camas Prairie and Summit Meadow are examples of areas where OHVs have been restricted for these reasons.

This EIS is the first comprehensive examination and analysis since the adoption of the Forest Plan about what areas in the Forest are suitable and desirable for OHV users. Although there is limited quantifiable monitoring data, the alternatives and project design criteria were based on public input of current use, anecdotal evidence, and field observations.

Proposed Monitoring Framework

A monitoring plan would be developed to assess the following:

- Are OHVs remaining on the designated system of routes?
- Are the trail widths being maintained or widened?
- Are the signs being maintained and followed?
- Is the Motor Vehicle Use Map being updated and distributed effectively on an annual basis?
- Is the selected alternative being implemented properly? Is the selected alternative having the intended effects?
- Are the project design criteria being implemented properly? Are the design criteria having the intended effect?

The results of monitoring would be reported in the annual Forest Plan Monitoring Report. The monitoring reports are available at: http://www.fs.fed.us/r6/mthood/publications/. If monitoring reveals undesirable outcomes, corrective actions may be taken. If the mitigations are not possible or effective, road or trail closures may be necessary and additional environmental analysis would be conducted.

In addition, monitoring would be completed for heritage resources and invasive plant species.

- *Heritage Monitoring*: Cultural resource inventory reports filed with State Historic Preservation Office require additional work to achieve no adverse effect, including developing a monitoring plan. The plan would focus on at-risk historic sites in order to measure effects on those sites. Also, the plan would include monitoring in areas within the route system with high concentrated use, high site density or high value sites (Priority Heritage Assets).

- *Invasive Plant Species Monitoring*: OHVs are a known vector for transporting invasive plant species. As such, the establishment and spread of invasive plants within the OHV locations would need to be monitored according to the protocols established in the *Mt. Hood Site Specific Invasive Plant Treatment* Record of Decision (2005).

In addition to monitoring, any illegal OHV use and/or trail construction would be reported to Law Enforcement and Investigations and the appropriate actions may be taken. The appropriate actions include, but are not limited to incident investigation, warning notices, writing citations, or closures.

An implementation team would develop the details of how the monitoring framework would be implemented. The monitoring approach would be developed to meet the current budget and workforce levels. The approach would be adopted as the budget and workforce levels change in the future to match the future levels and monitoring needs.

2.6. Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the tables focuses on treatment activities and effects where different levels of effects could be distinguished quantitatively or qualitatively among alternatives. Table 2-30 summarizes the alternatives by areas, roads, and trails where OHV use is permitted. Table 2-31 summarizes the miles of proposed routes, Table 2-32 summarizes the miles of proposed roads and trails, and Table 2-33 summarizes the staging areas for the action alternatives. Table 2-34 compares the major components of the action alternatives. Table 2-35 compares the environmental effects of implementing the alternatives.

Table 2-30. Comparison of alternatives by areas, roads, and trails where OHV use is designated or not prohibited.

Alternatives	Cross-Country OHV Use (Acres)[1]	Designated OHV Area (Acres)	OHV Use Permitted on Roads (miles)[2]	OHV Use on Motorized Trails (miles)	Roads Decommission (miles)	Total OHV Routes (miles)
Alternative 1	394,886	0	2,463	49	0	2,512
Alternative 2	0	1 (4 acres)	124	97	13	221
Alternative 3	0	1 (4 acres)	224	102	35	326
Alternative 4	0	1 (4 acres)	59	37	12	96

1. OHV cross-country travel is defined as an OHV leaving the designated road, trail or area.
2. Miles of roads includes convert to trail and motorized mixed-use.

Table 2-31. Comparison of proposed routes for action alternatives.

OHV System	Total Route (Miles)		
	Alternative 2	Alternative 3	Alternative 4
Bear Creek	39.1	39.3	--
Gibson Prairie	15.2	4.9	--
Graham Pass	--	63.2	--
LaDee Flats	38.9	42.0	25.1
McCubbins Gulch	50.6	60.1	33.6
Mount Defiance	--	5.5	--
Peavine	37.8	49.6	--
Rock Creek	39.6	61.2	37.2
Total Miles	**221**	**326**	**96**

Table 2-32. Comparison of proposed roads and trails for action alternatives.

OHV System	Road Routes (miles)						Trail Routes (miles)					
	Convert to Trail			Motorized Mixed Use			Existing Trails			New Trail Construction		
	Alt. 2	Alt. 3	Alt. 4	Alt. 2	Alt. 3	Alt. 4	Alt. 2	Alt. 3	Alt. 4	Alt. 2	Alt. 3	Alt. 4
Bear Creek	0	3		0	7.5		0	0		39.1	28.8	
Gibson Prairie	1.8	0.1		5.1	4.5		4	0		4.3	0.3	
Graham Pass		0			52.8			10.4			0	
LaDee Flats	9.9	18.8	10.9	27.4	17.9	9.2	0	0	0	1.6	5.3	5.1
McCubbins Gulch	4.7	17.2	7.3	8.8	3.2	0	32	25.6	25.6	5.1	14.1	0.7
Mount Defiance		0			5.5			0			0	
Peavine	19.6	28.9		15.2	11.6		0	0.2		3	8.9	
Rock Creek	14.6	25.9	15.1	16.7	26.6	16.9	2.1	2.1	2.1	6.2	6.6	3.2
Total Miles	51	94	33	73	130	26	38	38	28	59	64	9

Table 2-33. Comparison of staging areas for action alternatives.

OHV System	Staging Area Name	Acres	Parking Capacity	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Bear Creek	Gravel Storage Area (Road 16)	0.4	10	X	X	X	
	Gravel Storage Area (Road 1610)	0.4	10	X	X	X	
Gibson Prairie	Range Allotment Load Area	0.7	20		X		
Graham Pass	Lowe Creek Pit	1.4	45	X		X	
LaDee Flats	No Whisky Timber Sale Landing	1	30		X	X	
	Round Wolf Pit	2.2	65			X	
	No Whisky Timber Sale Landing	1	30				X
McCubbins Gulch	McCubbins Campground			X	X	X	X
	McCubbins Day-Use Site	0.8	25	X		X	X
	Path Timber Sale Landing	1.1	30	X	X	X	X
Peavine	Warm Springs Quarry	5.2	150	X	X		
	Devils Ridge Quarry	3.2	100	X		X	
Rock Creek	Post Point Quarry	4.1	130	X	X	X	X

Table 2-34. Comparison of major components of alternatives.

OHV System	Seasonal Restriction	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3	Alternative 4
Peavine	No OHV use from Dec 1 to June 15.	Current legal use.	Proposed trails and roads. OHV Classes I, II, and III.	Includes northern portion of the Proposed Action. All routes south of Road 42 are dropped. Add some additional routes to the west to make a viable system. Move the staging area to an open area adjacent to Road 4661. OHV Classes I and III.	No OHV use proposed.
LaDee Flats	No seasonal restriction.	Forest Order prohibits cross-country travel. OHV use permitted on designated roads and trails.	Proposed trails and roads. OHV Classes I, II, and III. Includes proposed OHV area at North Fork Quarry (approximately 4-acres).	Add some connector routes on west end of proposal. Road 4610-115, 4610-018, 4610-019 would be converted to trail (rather than mixed-use road). Change Abbott Road to allow all classes of OHV to use the route. Add a second staging area at the end of Abbott Road at viewpoint.	Eliminate Abbott Road sections.
Bear Creek	No OHV use from Nov 1 to June 15.	No OHV use.	Proposed new construction. OHV Class III only.	Same as Alternative #2, plus some additional decision roads (e.g., Road 1612 and 1640-620). Add small segment of new construction to connect routes.	No OHV use proposed.
Gibson Prairie	No OHV use from Nov 1 to June 15.	Forest Order prohibits cross-country travel. OHV use permitted on designated roads and trails.	Proposed trails and roads. OHV Class I only.	Connectors to Hood River county trails only. Drop all proposed routes that are included in the proposed action.	No OHV use proposed.

Table 2-34. (conmtinued)

OHV System	Seasonal Restriction	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3	Alternative 4
McCubbins Gulch	No OHV use from December 1 to April 1.	Designated OHV system of trails.	Continue existing use and add new trails to east. OHV Classes I and III.	Modified the Proposed Action to "clean up" some user-created routes. Adds some additional single-track trails to the West. No motorized mixed-use on paved roads.	Drop single-track trails to the West. Modified the Proposed Action to "clean up" some user-created routes. No motorized mixed-use on paved roads.
Rock Creek	No OHV use from December 1 to April 1.	Current legal use.	Proposed trails and roads. OHV Classes I and III. Includes a proposed day use area.	All routes, except access route, are outside the Wildland-Urban Interface Boundary. Single route allow access from Sportsman's Park to OHV routes. Add Road 4860 for OHV use to allow access to Badger Lake Campground. Includes a proposed day use area.	OHV routes on west half only. Includes some additional routes (including additional mixed-use, conversion to trail, and new construction) on west end to increase the overall miles of use for OHV. No day use area proposed.
Graham Pass	No seasonal restriction.	Current legal use.	No OHV use proposed.	OHV use proposed on gravel roads and current motorized trail (Rho Ridge Trail # 564).	No OHV use proposed
Mt. Defiance	No OHV use from December 1 to May 15.	Current legal use.	No OHV use proposed.	OHV use proposed on gravel roads.	No OHV use proposed

Table 2-35. Comparison of environmental effects of implementing the alternatives in relation to purpose and need/desired future conditions, and key and tracking issues.

Component	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3	Alternative 4
Purpose and Need/Desired Future Conditions				
Designate and/or construct OHV routes by class of OHV and time of year	2,463 miles of gravel and native surface roads and 49 miles of motorized trails are open to OHVs. Not designated by OHV classes.	221 miles of OHV routes by class and time of year. This represents a 93% reduction from Alternative 1.	326 miles of OHV routes by class and time of year. This represents a 90% reduction from Alternative 1.	96 miles of OHV routes by class and time of year. This represents a 97% reduction from Alternative 1.
Change the current management direction in the Forest Plan to comply with the Final Travel Management Rule	Implied Forest Plan direction is "open unless signed closed." Twenty standards and guidelines do not comply with the Final Travel Management Rule. Five standards and guidelines prohibit OHV use where use is occurring.	Forest Plan Amendment includes the 20 standards and guidelines that do not comply with the Final Travel Management Rule and the six standards and guidelines that prohibit OHV use where use is occurring. Implementing the Forest Plan Amendment will change the current management direction to comply with the Final Travel Management Rule.	Forest Plan Amendment includes the 20 standards and guidelines that do not comply with the Final Travel Management Rule and two standards and guidelines that prohibit OHV use where use is occurring. Implementing the Forest Plan Amendment will change the current management direction to comply with the Final Travel Management Rule.	Forest Plan Amendment includes the 20 standards and guidelines that do not comply with the Final Travel Management Rule. No standards and guidelines would be amended that prohibit OHV use where use is occurring. Implementing the Forest Plan Amendment will change the current management direction to comply with the Final Travel Management Rule.
Balance recreation opportunities for OHV use with other recreational uses of the Forest and natural resources as directed by the Mt. Hood National Forest Land and Resource Management Plan	Current OHV use does not consider recreational balance.	Alternative 2 was designed to achieve balance between motorized and non-motorized recreationists.	Alternative 3 considers additional OHV routes based on scoping comments. Overall, this alternative increases motorized recreation opportunities.	Alternative 4 considers dropping a proposed OHV system or reducing the number of routes within a proposed system. Overall, this alternative reduces motorized recreation opportunities.
Key Issue 1 – Motorized Recreation				
Proposed OHV Systems	1 OHV system; 4 disconnected motorized trails; 2,463 miles of gravel and native surface roads	6 proposed systems	8 proposed systems	3 proposed systems

Table 2-35. (continued)

Component	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3	Alternative 4
Number of locations with adequate miles	Forest-wide (combination of gravel and native surface roads and existing motorized trails)	Class I: one location (McCubbins)	Class I: four locations (Graham Pass, LaDee, Peavine, Rock Creek)	Class I: no location
		Class II: no location	Class II: two locations (Graham Pass, LaDee)	Class II: no location
		Class III: one location (McCubbins)	Class III: three locations (Graham Pass, McCubbins, Rock Creek)	Class III: no location
Miles of OHV routes by level of difficulty	Easiest: 2,463 miles	Easiest: 98 miles	Easiest: 156 miles	Easiest: 41 miles
	More: 51 miles	More: 98 miles	More: 132 miles	More: 42 miles
	Most: 0 miles	Most: 26 miles	Most: 38 miles	Most: 14 miles
Miles of OHV trails and roads by vehicle class(es)	Class I: 0 miles	Class I: 15 miles	Class I: 0 miles	Class I: 0 miles
	Class II: 0 miles	Class II: 8 miles	Class II: 0 miles	Class II: 0 miles
	Class III: 17 miles	Class III: 44 miles	Class III: 76 miles	Class III: 0 miles
	Class I & III: 32 miles	Class I & III: 91 miles	Class I & III: 177 miles	Class I & III: 82.5 miles
	Class I, II, & III: 2,464 miles	Class I, II, & III: 63 miles	Class I, II, & III: 73 miles	Class I, II, & III: 14 miles
Number of dead-end routes by OHV system	182	6	5	1
Number of staging areas and parking capacity	Estimated 61 staging areas based on the number of rock quarries. Estimated parking capacity of 4320.	7 staging areas with overall parking capacity of 368. Bear Creek location has 2 staging areas. All other systems have 1 staging area.	10 staging areas with overall parking capacity of 463. Bear Creek and LaDee Flats locations each have 2 staging areas. McCubbins Gulch has 3 staging areas. Gibson Prairie and Mount Defiance do not have any staging areas. All other systems have 1 staging area.	5 staging areas with overall parking capacity of 239. McCubbins Gulch location has 3 staging areas. LaDee Flats and Rock Creek have 1 staging area.
Key Issue 2 – Non-motorized Recreation				
Miles of non-motorized trail and other locations where sound emitted by OHVs might be detected	100 miles	15.4 miles	28.4 miles	6.6 miles
Acres of designated wilderness where sound emitted by OHVs might be detected	Not estimated	10,840 acres (Salmon-Huckleberry, Roaring River, Clackamas, and Lower White River Wildernesses)	14,870 acres (Salmon-Huckleberry, Mark O. Hatfield, Badger Creek, and Lower White River Wildernesses)	250 acres (Lower White River Wilderness)

Table 2-35. (continued)

Component	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3	Alternative 4
Miles of trails in designated wilderness where sound from OHVs might be detected	60 miles	3.8 miles	12.5 miles	0 miles
Distance between the Rock Creek proposed OHV system and Sportsman's Park subdivision	0.1 mile	0.7 mile	0 mile	3.0 miles
Key Issue 3 – Wildlife Disturbance				
Miles of OHV trails and roads	2,463 miles	221 miles	326 miles	96 miles
Miles of new trail construction	n/a	59 miles	69 miles	9 miles
Acres of OHV open to cross-country travel	394,886 acres	0 acre	0 acre	0 acre
Effects to big game use in each proposed OHV system	Little to no protection from disturbance to big game (deer and elk). Seasonal closures in place at McCubbins Gulch and disconnected gravel and native surface roads.	Protection during winter use and summer calving areas. Includes seasonal closures at five proposed OHV systems: Peavine, Gibson Prairie, McCubbins Gulch, Rock Creek and Bear Creek.	Protection during winter use and summer calving areas. Includes seasonal closures at six proposed OHV systems: Peavine, Gibson Prairie, McCubbins Gulch, Mount Defiance, Rock Creek and Bear Creek.	Protection during winter use and summer calving areas. Includes seasonal closures at two proposed OHV systems: McCubbins Gulch and Rock Creek.
Tracking Issues				
User capacity in available visitor days per year	2,664,480 days	290,008 days	388,744 days	173,280 days
Miles of motorized mixed use (safety)	2,463 miles	73 miles	130 miles	26 miles
Miles of decommissioned roads	0 miles	12.6 miles	34.6 miles	12.4 miles
Effects of OHV use on Irrigation Districts (economics)	Most damage to irrigation ditches due to cross-country travel and miles of OHV routes.	Less damage to irrigation ditches due to elimination of cross-country travel and decreased miles of OHV routes.	Less damage to irrigation ditches due to elimination of cross-country travel and decreased miles of OHV routes (greater than Alternative 2)	Least damage to irrigation ditches due to elimination of cross-country travel and decreased miles of OHV routes.
Effects of OHV use on soils (risk ratings)	Highest potential for soil damage of any alternative due primarily to cross-country travel.	Low potential for soil damage (lower than Alt 3 and higher than Alt 4)	Highest potential for soil damage of the action alternatives.	Lowest potential for soil damage due to elimination of cross-country travel and decreased miles of OHV routes.

Table 2-35. (continued)

Component	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3	Alternative 4
Number of stream crossings and number of stream crossings over fish bearing streams	3,404 crossings	102 crossings	161 crossings	46 crossings
	435 crossings	12 crossings	22 crossings	8 crossings
Miles of OHV trails and roads within 100 feet of streams	203 miles	9 miles	15 miles	4 miles
Miles of OHV trails and roads in drinking water source areas	1,340 miles	66 miles	170 miles	25 miles
Effects of OHV use to native plants, including sensitive plants	Greatest potential for harm (due to cross-country travel)	Harm is greatly reduced compared to Alternative 1 (due to no cross-country travel); however there is still some potential for harm as a result of new OHV trail construction	Harm is greatly reduced compared to Alternative 1 (due to no cross-country travel); however there is still some potential for harm as a result of new OHV trail construction (greater than Alternative 2).	Least potential for harm compared to the other alternatives because there is no cross-country travel and limited new OHV trail construction
Effects of OHV use on invasive plants (risk of spread and/or new infestations)	Greatest risk (due to cross-country travel)	Reduced risk (because routes are staging areas are designated)	Reduced risk (because routes and staging areas are designated). Slightly greater than Alternative 2 due to increased miles of proposed routes.	Least risk (because the least amount of proposed routes and staging areas)
Cost of road maintenance per year where OHV use is permitted. Savings on the cost of road maintenance per year	$1,231,500	$1,207,500	$1,184,500	$1,215,000
	$0.0	$24,000	$47,000	$16,500
Cost of maintaining all OHV trails	$41,650	$125,715	$166,430	$59,415
Heritage sites potentially affected	154 (estimated) sites	2 sites	8 sites	1 site
Effects of OHV use for law enforcement in regards to compliance and enforcement	High (due to cross-country travel and number of existing trail miles and mixed use road miles)	Low to Moderate (due to no cross-country travel and less trail miles and mixed use road miles)		

2.7. 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 Alternative 2 (Proposed Action) as well as the preliminary effects analysis conducted by the interdisciplinary team suggested alternative methods for achieving the purpose and need. Some of these alternatives were outside the scope of this EIS, did not met the purpose and need for action, were not reasonably feasible or viable, were duplicative of the alternatives considered in detail, or were determined to cause unnecessary environmental harm. Four alternatives were considered, but eliminated from detailed consideration for reasons summarized below.

2.7.1. Prohibit Off-highway Vehicle Use on the Forest

This alternative would prohibit OHV use on the Forest. Only street-legal highway licensed wheeled motor vehicles would be permitted on existing National Forest Service roads. No motorized trails would be located on the Forest. Public comments suggested this alternative to eliminate all environmental and social impacts associated with OHV use.

This alternative would not meet the purpose and underlying need for this project. The primary purpose of this project is to designate OHV use by class of OHV and time of year. Current regulations and policies direct National Forests to provide a diversity of road and trail opportunities, including off-road vehicle recreation opportunities in appropriate places and under proper management (Forest Service Manual 2355.03). The Final Travel Management Rule states 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 OHV use established with public involvement will enhance public enjoyment of National Forests while maintaining other important values and uses of NFS [National Forest Systems] lands” (70 CFR 68265).

OHV use is an established and legitimate recreation opportunity on the Forest. OHVs are used by forest visitors for access and as a recreational experience in its own right. Based on current use and public input, providing for a balanced recreation experience across the Forest compels designating some OHV routes, where appropriate. As such, this alternative was not considered further.

2.7.2. Designate All Existing “On-the-Ground” Routes

In this alternative, all existing “on-the-ground” routes would be designated and incorporated into the OHV Management Plan. This includes classified as well as non-system (user-created) roads and trails. Current state law allows OHVs to operate on any road open to the public which is not paved. (For more information on current Oregon State Laws regarding Off-Road Vehicles; Snowmobiles; All-Terrain Vehicles go to: http://www.oregon.gov/OPRD/ATV/links.shtml). Many gravel and native surface roads on the Forest meet these criteria and thus are open to OHV travel. Cross-country travel would be eliminated. New user-created routes would not be allowed.

This alternative does not meet the underlying need to “balance recreation opportunities for OHV use with other recreational uses of the National Forest and natural resources as directed by the Mt. Hood National Forest Land and Resource Management Plan.” In some cases, there are duplicate user-created roads and trails within a few hundred yards of each other. The trails may include dense, braided networks of intersecting paths. In other situations the user-created roads and trails, because of their poor placement and lack of design, are causing resource damage.

Some of these user-created roads and trails would not meet the Forest Plan direction for resource and recreation management. Considerable work would be needed to bring some of these routes into compliance with applicable standards. Duplicate routes adjacent to one another would still exist. Designating all user-created trails would not minimize damage to soil, water, wildlife, vegetation, and other forest resources associated with motorized recreation use across the Forest.

In some instances, the user-created trails are located in the best locations to minimize resource damage and to connect existing trail networks. These user-created trails were considered in the development of alternatives and have been incorporated into the alternatives. These user-created trails are listed as "new trails" in the description of alternatives and Chapter 3 analyzes them in detail. These trails would be brought up to Forest Service trail standards when the project is implemented.

Rationale for not including all gravel and native surface roads is discussed in Section 2.7.4 Off-Highway Vehicle Use on Gravel and Native Surface Roads.

2.7.3. Continued Off-Highway Vehicle Use in Specific Areas

When designing the preliminary proposed action as described in Section 2.1, several other specific OHV locations were considered. The following locations were eliminated from detailed study because of incompatibilities with existing land use allocations, mixed-use analysis and/or adjacent landowners as well as existing resource damage. The reasons for eliminating each location are discussed below.

A. Black Wolf – This proposed OHV system is along roads near Forest Service Road 58 on the Zigzag and Clackamas River Ranger Districts. The proposed OHV system included gravel and paved roads. OHV use on the paved roads posed mixed-use and safety concerns. In addition, a large portion of the proposed system was located in Roaring River late-successional reserves (LSR) and Tier 1 Key Watershed (Salmon River). Based on these concerns, this area was eliminated from detailed study because it does not meet the guiding principle of providing safety for all forest visitors or the underlying need of "balancing recreation opportunities for OHV use with other recreational uses of the National Forest and natural resources as directed by the Mt. Hood National Forest Land and Resource Management Plan."

B. Wildcat – This proposed OHV location is an area near Wildcat Mountain along the Forest Service Road 36 system on the Zigzag Ranger District. The proposed area is near the Sandy Watershed which is the drinking water source for Sandy. Current OHV use has caused significant resource damage on and off roads in the area, including encroachments into the nearby Salmon-Huckleberry Wilderness. The primary resource concerns include soils and water quality. Given the terrain and existing sedimentation, the water quality of the drinking water was a concern. Based on these resource concerns, this location was eliminated from detailed study because it does not meet the underlying need of "balancing recreation opportunities for OHV use with . . . natural resources as directed by the Mt. Hood National Forest Land and Resource Management Plan."

C. Hillock Burn – This proposed OHV system is along the Forest Service Road 45 system on the Clackamas River Ranger District. This location is adjacent to Bureau of Land Management (BLM) lands. Current OHV users travel between the Forest Service and BLM lands through interconnecting trails. BLM will begin OHV planning on its lands in the near future. When BLM begins planning, the Forest Service Roads in this area may be reconsidered as potential OHV routes through a separate NEPA process. Based on the incompatibility with adjacent landowners, this area was eliminated from detailed study.

D. Oak Grove –This proposed OHV system is adjacent to the proposed LaDee Flats location along the Forest Service 46 Road system on the Clackamas River Ranger District. The majority of the proposed routes are within newly designated wilderness area, including the Huxley Ridge motorized trail. Also, all routes within this proposed system were dead-ends with no loop opportunities provided. Lastly, the Road 4612 and Road 4612-130 are high sediment producing roads based on the North Fork Clackamas Watershed Analysis and these roads were proposed as OHV routes in the Oak Grove system. Based on these concerns, this area was eliminated from detailed study because the system does not meet the underlying need of "balancing recreation opportunities for OHV use with . . . resource sustainability."

E. Hugh Creek – This proposed OHV system is along the Forest Service Road 70 system on the Clackamas River Ranger District. The proposed OHV system included gravel and paved roads. OHV use on the paved roads posed mixed-use and safety concerns. Also, the majority of the proposed system was in the Bagby LSR. In addition, listed fish species are located in Nohorn Creek and Hugh Creek which are adjacent to Road 7040, 7030 and 70. Based on these concerns, this area was eliminated from detailed study because it does not meet the guiding principle of providing safety for all forest visitors or the underlying need of "balancing recreation opportunities for OHV use with . . . resource sustainability."

F. Fish Creek – This proposed OHV system is located on the decommissioned main roads that used to traverse the Fish Creek watershed (former roads 54 and 5420) on the Clackamas River Ranger District. The Fish Creek Environmental Assessment (EA) (1997) analyzed motorized use in this area. The Decision Notice (DN) restricts motorized use and states that there will not be any trails or trail bridges constructed or added to the trail system. Although this NEPA could replace the Fish Creek EA and DN, the remaining trail system is not easily accessible from the Forest Service road system and does not provide any loop opportunities. As such, the proposed system in the Fish Creek area was not a viable OHV system and was eliminated from detailed system.

2.7.4. Off-Highway Vehicle Use on Gravel and Native Surface Roads

Current state law allows OHVs to operate on any road open to the public which is not paved. (For more information on current Oregon State Laws regarding Off-Road Vehicles; Snowmobiles; All-Terrain Vehicles go to: http://www.oregon.gov/OPRD/ATV/links.shtml). Many gravel and native surface roads on the Forest meet these criteria and thus are open to OHV travel. Under this alternative, OHVs would be allowed to continue using all these roads. In addition to these roads, other OHV trails may be considered as well.

Since licensed, street legal Class II OHVs (jeeps, pickups) and Class III vehicles (motorcycle-dual sport) are not going to be restricted from existing roads on the Forest through implementation of any of the action alternatives, the District Rangers and interdisciplinary team considered a variety of options for including gravel roads in Alternative 3. Gravel roads were incorporated into Alternative 3, using the following criteria. These criteria are based on meeting the purpose and need for the project. In particular, these criteria are intended to meet the underlying need to "balance recreation opportunities for OHV use with other recreational uses of the National Forest and resource sustainability."

- Incorporate recommendations from local and state government agencies as well as tribal governments. If the recommendations from the government agencies contradict the guidelines below, defer to the government agencies.
- Do not include any routes that present major motorized mix-use concerns for OHV users or other vehicles. If concerns are at odd with the guidelines below, defer to the lowest risk situation.
- Do not include dead-ends roads unless these roads provide access to a specific viewpoint and/or destination.
- Do not include roads where a sizable portion of a paved road is needed as a connector (i.e., crossing the paved road is okay).
- Utilize routes that would provide loop opportunities.
- Utilize only roads that are currently open system roads.
- Avoid routes that would conflict with adjacent land management objectives.
- Unless there is a compelling reason, do not include routes if Class I OHV use is not already occurring and/or established unless there is a compelling reason. In addition, do not allow Class I vehicles on proposed routes in areas where there are existing issues (i.e., resources, user conflicts) with user created motorized trails.
- Consider seasonal restrictions, if needed. Follow all existing seasonal road closures.
- Do not include routes where the Forest Service would likely be proposing road decommissioning or year-round closure (i.e., storm proofing) in upcoming NEPA processes.
- Review the resulting system of roads (single lane, gravel or native surfaced) for resource concerns. In particular, review the native surface roads to ensure these roads are not currently causing erosion problems that may be increased with additional OHV use.

Based on these criteria, the Graham Pass and Mount Defiance locations were added to Alternative 3. All other gravel roads were not considered further because they do not meet the all of the above criteria.

Chapter 3 - Affected Environment and Environmental Consequences

3.0. Affected Environment and Environmental Consequences

Chapter 3 of this EIS summarizes the physical, biological, social, and economic environments of the affected project area (existing conditions) and the potential changes to those environments due to implementation of the alternatives discussed in Chapter 2. It also presents the scientific and analytical basis for the comparison of alternatives presented. Fore ease in presentation and comparison, discussions are separated into individual resource areas.

The focus of the analysis disclosed in each section is on the effects of the No Action and action alternatives on the issues described in Section 1.10. Effects are defined as:

- **Effects:** Adverse and/or beneficial direct effects occur at the same time and in the same general location as the activity causing the effects. Adverse and beneficial indirect effects are those that occur at a different time or location from the activity causing the effects. Both types of effects are described in terms of magnitude, intensity, duration, and timing.

- **Cumulative Effects:** These effects result from the incremental impacts of the proposed actions/alternatives when added to other past, present, and reasonably foreseeable actions, both on the Forest as well as other adjacent federal, state, or private lands.

Effects include ecological (i.e., the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative (40 CFR 1508.7 and 1508.8).

3.1. Recreation

This analysis is based on the information found in the Recreation Specialist Report for this project, which is in the project file located at the Forest Headquarters Office in Sandy, Oregon.

3.1.1. Affected Environment

Recreation Planning Framework

Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) is a classification system in which factors affecting recreation opportunities, such as access, naturalness, presence of other people, and management controls, are used to describe discrete recreation settings, and organize them along a continuum, or spectrum, from “urban” to “primitive.” Each ROS setting is described in terms of specific combinations of activities, facilities and experience opportunities. ROS settings are primarily affected by an area’s size, its distance from a road and the likelihood of users encountering other users. The seven ROS settings, from the most primitive to the most developed are: primitive; semi-primitive non-motorized; semi-primitive motorized; roaded natural; roaded modified; rural; urban.

The ROS provides a framework for describing the types of outdoor recreation and experiences that the public can expect at any given location in the Forest. The ROS also provides a context and criteria for describing and measuring the recreation effects from projects and activities. The Mt. Hood National Forest Land and Resource Management Plan (USDA FS 1990) prescribes a desired ROS setting for every acre of the Forest. Changing the existing mix of ROS areas in the Forest is not an objective of this project. The ROS settings that would be most compatible with designated OHV roads and trails are semi-primitive motorized, roaded natural and roaded modified. Table 3-1 describes these three ROS settings more thoroughly.

Table 3-1. Descriptions of semi-primitive motorized, roaded natural and roaded modified recreation opportunity spectrum (ROS) settings (U.S. Department of Agriculture 1986)

Semi-Primitive Motorized (SPM)	Roaded Natural (RN)	Roaded Modified (RM)
• Moderate opportunity for solitude, tranquility and closeness to nature. High degree of self-reliance, challenge and risk in using motorized equipment. • Predominantly natural appearing environment. • Low concentration of users but often evidence of other users on trails. • Minimum on-site controls and restrictions present but subtle. • Limited facilities for signing sanitary and safety needs in native-like rustic materials. • Minimal site modification for facilities. • Vegetation alterations very small in size and number, widely dispersed and not obvious	• Opportunity to affiliate with other users in developed sites but with some chance for privacy. Self-reliance on outdoor skills of only moderate importance. Little challenge and risk. • Mostly natural appearing environment as viewed from sensitive roads and trails. • Interaction between users at campsites is of moderate importance. • Some obvious on-site control of users. • Access and travel is conventional motorized including sedan and trailers, RVs and some motor homes. • Moderate amount and complexity of facilities for comfort and convenience of user. Use native materials but with more refinement in design. • Vegetation alterations done to maintain desired visual and recreation characteristics.	• Opportunity to get away from others but with easy access. Some self-reliance in building own campsite and use of motorized equipment. Feeling of independence and freedom. Little challenge and risk. • Substantially modified natural environment except for campsite. Roads, landings, slash and debris may be strongly dominant from within yet remain subordinate from distant sensitive road and highways • Moderate evidence of other users on roads. Little evidence of others or interaction at campsites. • Little on site controls of users except for some gated roads. • Conventional motorized access including sedan and trailers, RVs, ORVs and motor bides. • No on-site facilities except signing at major road junctions. Occasional sanitary facilities for user health protection. • Site modification by users only. • Shape and blend vegetative alterations. Maintain campsites and immediate foregrounds to site in natural appearing state.

Forest Recreation Niche

The recreation niche is a description, or characterization, of the distinct role the Forest plays in providing outdoor recreation opportunities, experiences and benefits. The niche allows managers to focus management efforts on what is unique and valuable about the Forest. The niche is, in part, determined by public expectations (demand) and by the ecological capabilities of the land. In 2007, the Forest (with public input) developed a recreation niche statement. Public participants in this process described and mapped their preferred recreation activities and where they recreate. This "sense of place" map product was translated into a narrative about the relative importance of the Forest for various recreation opportunities, experiences and benefits. The wide variety of visitor preferences and uses were grouped into six spatial categories (settings) named "the mountain," "travel-ways," "destination water," "wilderness," "neighbor-woods" and "communities." The Forest's recreation niche summary statement is in Section 1.4.

The recreation niche statement discloses that the Forest offers only a moderate opportunity for OHV recreation. The Forest is not known as a major provider of OHV recreation, and it is not a major OHV destination. It currently provides mostly "easier" and a few "more difficult" OHV roads and trails close to the Portland/Vancouver Metropolitan area. The niche setting that would be most compatible with designated OHV roads, trails, and areas is "neighbor-woods," the vast, undeveloped forest area outside of wilderness, major highway corridors and significant rivers and lakes (US Forest Service 2006).

Description of Recreation Resources

Mt. Hood National Forest Roads, Trails and Areas Available for OHV Use

Oregon State Law allows OHVs to travel on single-lane gravel and native-surface roads (Oregon 2007). Approximately 2,463 road miles are available for OHV use (all vehicle classes). Certain classes of vehicles are also permitted on roughly 49 miles of Forest trails. There are areas of the Forest where the Forest Plan (as amended) does not specifically prohibit cross-country travel by recreational vehicles. Cross-country OHV travel is not prohibited on 394,886 acres of the Forest (GIS calculation). An indeterminate amount of this area is probably inaccessible because of other physical barriers, such as rock outcrops, steep slopes, forest vegetation, rivers and streams. The Alternative 1 (No Action) description in this section lists the areas of the Forest where motorized cross-country travel are specifically prohibited. A more detailed description of Alternative 1 is available in Chapter 2 of the EIS.

Mt. Hood National Forest Trails Available for Exclusively Non-Motorized Use

There are roughly 483 miles of Forest system trails outside designated wilderness areas that are managed exclusively for non-motorized uses. The 49 miles of Forest trails that are managed for OHV use are also open to non-motorized uses. In addition, there are roughly 468 miles of wilderness trails that are available only for hikers and equestrians.

Developed Recreation Sites

The Forest manages 169 developed recreation sites: 83 campgrounds; 11 picnic (day-use) sites; 42 trailheads; eight rental cabins (including lookout towers); four horse camps; two resorts; one major and three minor interpretive sites; and 15 snow parks (and other minor sites). OHVs are currently only permitted at McCubbins Gulch Campground and McCubbins Day-Use area.

Other OHV Areas in Oregon

There are more than 40 designated OHV sites and areas in Oregon managed by several public land management agencies. Given the willingness of OHV users to drive substantial distances to recreate (Bergerson et al. 2005), many of those who use the existing roads and trails in the Mt. Hood National Forest for OHV recreation probably also use these other areas in addition to Forest routes. National Visitor Use Monitoring reported substitute behavior choices made by OHV users if for some reason they were unable to use their vehicles in the National Forests of the Pacific Northwest. About 64% of primary OHV users responded that they would go somewhere else (outside the National Forest System) for the same activity. Other substitute behavior choices included coming back another time, staying at home, going somewhere else for a different activity, and going to work (English, Kocis and Hales 2004).

Selected OHV areas in Oregon are displayed in Table 3-2. Oregon Dunes National Recreation Area, Sand Lake Recreation Areas, Christmas Valley Sand Dunes and other dune areas are not listed in the table because riding on sand dunes is fundamentally different than OHV experiences in the Mt. Hood National Forest.

Table 3-2. Selected OHV recreation sites and areas in Oregon (source: http://atv.prd.state.or.us/places.php).

Name	Managing Agency	Location	Vehicle Classes	Season	Description
Blue Mountain OHV Trail	Wallowa- Whitman National Forest[1]	8 miles east of Unity on Hwy 26	I and III	Summer and Fall	60 miles of trails
East Fort Rock	Deschutes National Forest[1]	21 miles east of Bend on US 20	I and III	All year	318 miles of easy to most difficult trails
John's Peak	Bureau of Land Management	10 miles west of Jacksonville in southern Oregon	I, II and III	All year	> 14,000 acres of trails with varying difficulty
Millican Valley	Bureau of Land Management	25 miles SE of Bend on US 20	I, II and III	Some restrictions	240 miles of easy to most difficult trails
Morrow County Trails	Morrow County Public Works	20 miles east of Heppner	I, II and III	All year	> 100 miles of trails
Shotgun Creek OHV Area	Bureau of Land Management	East of Springfield	I, II and III	All year	6,000 acres of trails with varying difficulty
Tillamook OHV Area	Oregon Dept of Forestry	State Hwy 6 between Portland and Tillamook	I, II and III	All year	> 100 miles of easy to most difficult trail
Upper Walla Walla	Umatilla National Forest[1]	12 miles east of Milton- Freewater	III	Spring, Summer and Fall	40 miles of trails
Virtue Flat	Bureau of Land Management	11 miles east of Baker City	I, II and III	All year	> 5,000 acres of trails with varying degrees of difficulty
West End (Sunflower)	Umatilla National Forest[1]	NE of John Day	I and III	All year	91,000 acres with all degrees of difficulty

1 All National Forests re completing analysis under th Final Travel Management Rule. Base on this process, some of these details may charge. For the purposes of this analysis, it is assumed that these acres and season will remain unchanged, as stated in the assumptions discussed in the Recreaton Specialist Report.

OHV Use in Mt. Hood National Forest

National Visitor Use Monitoring[1] (NVUM) findings confirm the niche statement that the Forest is not a major provider of OHV recreation (English, Kocis and Hales 2004). The first round of NVUM surveys for the Forest was conducted between October 2002 and September 2003. NVUM surveys involved a stratified, random sample (interviews) of visitors exiting the Forest. During the interview, visitors were asked to self-identify all of the recreation activities in which they participated during the sample trip. They were also asked to identify the primary recreation activity on their sample trip. The survey found that 0.16% of all recreation visits that year were primarily for OHV use. This percentage equates to roughly 6,214 visits during 2003 (English, Kocis and Hales 2004).

A somewhat larger percentage of Forest visitors indicated that they participated in OHV recreation even if it was not their primary reason for visiting the Forest. For example, a person visiting the Forest to hunt, but who rides an OHV

1 NVUM information is valid and applicable at the forest level. It was not designed to be accurate at the District or site level, nor does it precisely describe participation in discrete activities. The study was designed to estimate the total number of people during a year visiting the forest. The quality of the visitation estimate is dependent on the preliminary sample design development, sampling unit selection, sample size and variability, and survey implementation. The descriptive information about national forest visitors, including activity participation, is based upon only those visitors who agreed to be interviewed. Activities that are distinctly seasonal in nature (such as hunting) may not be adequately captured in the NVUM data.

while there, was not counted as a primary OHV visit. This person would be counted as a secondary OHV visit. The total percentage of visitors that reported participating in OHV recreation (combining both primary and secondary visits) was 0.52% of all visits, or roughly 22,731 visits according to NRIS HD-NVUM 1.2.
The Mt. Hood National Forest ranks fourteenth out of twenty administrative units in the Pacific Northwest Region of the Forest Service in terms of the *percentage* of primary OHV visits. In terms of the *number* of primary use OHV visits, the Forest ranks eleventh in the Region (English, Kocis and Hales 2004).

The Forest ranks near the bottom in the Pacific Northwest Region for the *percentage* of total OHV participation (primary visits + secondary visits). Only the Gifford Pinchot National Forest in Washington State ranks lower. The total *number* of OHV participants (primary visits + secondary visits) was higher on only five other National Forests in the Region (Deschutes, Mt. Baker-Snoqualmie, Siuslaw, Wallowa-Whitman, and Wenatchee) than on the Mt. Hood (English, Kocis and Hales 2004).

The percent of Forest visitors that report OHV participation as either their primary or secondary use in the Mt. Hood National Forest is considerably lower than the national average. Nationally, about 2.5% of the 205 million annual recreation visits to National Forests involve participation in OHV use as the primary activity. About 3.1% nationally reports OHV use as a secondary activity (English, Kocis and Hales 2004). These data are considerably below the average percent participation for Oregon overall (22.2% participation) as reported in the National Survey on Recreation and the Environment (Cordell, Betz, Green and Stephens 2008).

The 2004 Oregon Statewide Motorized Trail Use Survey reported that OHV enthusiasts are willing to travel reasonably long distances to pursue their most frequent activity. Survey results show that the median distance traveled to reach an OHV riding opportunity is in the range of 41 and 50 miles, and nearly one-fifth of OHV users travel more than 100 miles (Bergerson et al. 2005). NVUM also reported the distances OHV users travel to ride on National Forest System lands in the Pacific Northwest. The median distance traveled is over 200 miles (English, Kocis and Hales 2004). This finding is probably related to the long distances separating premier destinations (such as Oregon Dunes, East Fort Rock and Wenatchee National Forest) from major population centers (i.e., Seattle and Portland). Despite a willingness to travel longer distances, the proximity of Mt. Hood National Forest roads and trails makes the Forest an attractive, relatively-close location for OHV recreation for the Portland/Vancouver Metropolitan area and the Willamette Valley.

Motorized Recreation Preferences

In Oregon, ATV riding (three- and four-wheel) is by far the most popular type of OHV use, reported by 40% of OHV users as their favorite activity. Seventy percent of Oregon households that participate in OHV sports report that they rode an ATV in 2004 (Table 3-3). 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 (Bergerson et al. 2005).

Off-road motorcycling is reported to be the favorite activity by 25% of OHV users. Eleven percent and 8% of OHV users favor four-wheel driving with stock vehicles and four-wheel driving with modified vehicles, respectively. Modified four-wheel drive vehicles have modified tires and/or suspension upgrades (Bergerson et al. 2005).

Table 3-3. Frequency of motorized trail participation in Oregon among households reporting OHV participation. Data is from the 2004 Oregon Statewide Motorized Trail User Survey. N = 196.

Activity	Participated in Last Year (percent)	Estimated Oregon Households	Of Participants in Last Year, How Often? (percent)			
			Weekly	2-3/ Month	Once/ Month	Less Often
ATV Riding (3 & 4 wheel)	70	68,600	12	34	19	34
Off-road motorcycling	44	43,100	16	29	20	35
4-wheel driving (stock)	44	43,100	21	24	24	31
4-wheel driving (modified)	29	28,400	21	21	33	24

The Oregon Statewide Motorized Trail User Survey asked OHV users about trail difficulty preferences. Fifty-one percent of respondents prefer "more difficult" trails. Twenty-eight percent prefer "most difficult" trails. Twenty-one percent prefer "easier" trails (Bergerson et al. 2005).

Quiet Recreation Uses

The 2003 NVUM for the Forest estimated that there are approximately 4.4 million recreation visits to the Forest each year (Kocis, English et al. 2004, NRIS HD-NVUM 1.5). A description of visitor activities was developed from the survey.[2] During their visit to the Forest, the top five recreation activities of visitors were relaxing, viewing wildlife, hiking/walking, viewing natural features, and driving for pleasure (Table 3-4). Each visitor surveyed also identified their primary activity for that specific recreation visit to the Forest. The top primary activities were downhill skiing, relaxing, hiking/walking, other non-motorized activities, and viewing natural features (Kocis, English et al. 2004).

OHV users enjoy many of the same recreation pursuits as the entire American population. Three of the top five most popular recreation pursuits in this country are common to the entire population and to OHV users. The recreation activities with the highest percent participation nationally in the entire population are walking for pleasure (developed setting), family gatherings outdoors, viewing and photographing natural scenery, visiting nature centers, and driving for pleasure. The recreation activities with the highest percent participation among all OHV users nationally are walking for pleasure (developed setting), driving for pleasure, family gatherings outdoors, sightseeing, and viewing/photographing natural scenery (Cordell, Betz, Green and Stephens 2008). These data are displayed in Table 3-4 for the purpose of comparing with Mt. Hood National Forest visitor participation.

Table 3-4. Mt. Hood National Forest activity participation and primary activity (NVUM) and national user participation (NSRE) in comparable recreation activities. NVUM data source is the first round of National Visitor Use Monitoring surveys (Kocis, English et al 2004 NRIS HD-NVUM 1.5). NSRE data source is 1999-2007 survey information for the National Survey on Recreation and the Environment (Cordell, Betz, Green and Stephens 2008). "No data" indicates that there was no direct cross-walk between NVUM and NSRE. "+" indicates that the activity participation rate is actually higher than indicated because participation in variations of the activity were reported separately. The NVUM activity participation data is based upon only those visitors who agreed to be interviewed. Activities that are distinctly seasonal in nature (such as hunting) may not be adequately captured in the NVUM data.

Activity	% Mt. Hood Participating (NVUM)	% as Main Activity (NVUM)	% All Users Participation (NSRE)	% All OHV Users (NSRE)
Backpacking	5.9	1.0	11.4	19.9
Bicycling	5.3	1.3	22.0	34.4
Cross-country Skiing	4.2	2.1	4.8	6.7
Day Hiking	53.5	22.8	35.4	47.9
Developed Camping	7.3	4.4	29.1	44.7
Downhill Skiing	20.9	18.8	9.2	14.8
Driving for Pleasure	29.0	2.8	59.1	86.3
Family Gathering Outdoors	no data	no data	76.2	84.9
Fishing	6.1	1.4	24.5+	44.6+
Gathering Forest Products	3.2	0.3	32.5	52.0
Horseback Riding	0.3	0.2	8.7	16.8
Hunting	no data	no data	10.0+	28.4+

2 The descriptive information about National Forest visitors, including activity participation, is based upon only those visitors who agreed to be interviewed. Activities that are distinctly seasonal in nature (such as hunting) may not be adequately captured in the NVUM data.

Table 3-4. (continued)

Activity	% Mt. Hood Participating (NVUM)	% as Main Activity (NVUM)	% All Users Participation (NSRE)	% All OHV Users (NSRE)
Motorized Water Activities	1.0	0.0	28.5+	46.9+
Nature Center Activities	13.7	0.0	61.8	69.5
Nature Study	6.0	0.1	no data	no data
Non-motorized Water	4.3	1.0	11.2+	21.4+
OHV Use	0.6	0.1	19.0	100.0
Other Motorized Activities	0.1	0.1	no data	no data
Other non-motorized	10.6	5.2	no data	no data
Picnicking	7.5	0.5	58.9	65.2
Primitive Camping	2.8	0.7	17.8	37.2
Relaxing	47.4	10.0	no data	no data
Resort Use	14.3	3.5	no data	no data
Snowmobiling	0.2	0.2	4.3	16.4
Sightseeing	no data	no data	58.5	78.8
Viewing Natural Features	52.3	7.9	66.5	75.9
Viewing Wildlife	42.0	3.1	51.4	67.6
Visiting Historic Sites	24.3	0.6	51.5	59.3
Walking for Pleasure	no data	no data	86.2	88.9

Primary OHV users also participate in a variety of other recreation activities during their visit to a National Forest. In the Pacific Northwest Region, the most popular secondary activity for primary OHV users is developed camping (Table 3-5). Relaxing and viewing natural features also have high participation rates (English, Kocis and Hales 2004).

Table 3-5. Secondary activities reported by primary OHV users in the Pacific Northwest Region of the Forest Service. Data source is the first round of National Visitor Use Monitoring surveys (English, Kocis and Hales 2004).

Activity	% of Primary OHV Users
Developed Camping	49.85
Primitive Camping	5.96
Viewing Wildlife	24.42
Viewing Natural Features	46.22
Visiting Historic Sites	0.04
Relaxing	46.46
Fishing	1.99
Hunting	0.03
Driving for Pleasure	16.74
Hiking/Walking	20.40
Gathering Forest Products	9.54

Recreation Trends

In ten years, the top five outdoor recreation activities in the Forest are predicted to be viewing natural features, hiking, viewing wildlife, visiting historic sites and downhill skiing. In the market zone (the area of origin of most Forest visitors), the top five activities are predicted to be viewing natural features, viewing wildlife, pleasure driving, hiking and bicycling (Slider 2007; based on NSRE projections). Roughly three quarters of all visitors live within a 150-mile radius of the Forest. About 50% of visitors come from Multnomah, Washington, Hood River and Wasco Counties in Oregon and Clark and Klickitat Counties in Washington (Kocis, English et al. 2004).

Cordell (2008) reports the remarkable growth of OHV use in the United States. During the first US National Recreation Survey in 1960, OHV recreation was not a reportable activity. OHV use today, however, is among the fastest growing outdoor activities. Nationally, the number of people (16+ years of age) who report participating in OHV sports is over 44 million (Table 3-6). Annual OHV sales more than tripled between 1995 and 2003 (sales have leveled off since 2003). Total OHV ownership of newly purchased and previously purchased machines increased 174% between 1993 and 2003, from fewer than three million to more than eight million vehicles. More than twice as many OHV enthusiasts own three- and four-wheel ATVs than own motorcycles (Cordell 2008).

Based on survey data and sales trends, Cordell (2008) projects 9.8 million three- and four-wheel ATVs and off-road motorcycles in the U.S. in early 2008. Local sales of four-wheel ATVs in 2006 and 2007 were strong. During 2006 in Clackamas, Hood River, Multnomah, Wasco, Washington and Clark Counties, 2,999 four-wheel ATVs were sold. During the first six months of 2007, 2,666 vehicles were sold by the same dealerships (Gardner 2007).

Some quiet recreation activities show strong growth, and they are predicted to become even more popular (such as viewing natural scenery, hiking, bicycling, kayaking, and viewing wildlife). Other quiet activities are becoming less popular (such as horseback riding, primitive camping, and cross-country skiing). Such trends may represent Americans reordering their priorities (Cordell, Betz et al. 2008).

Table 3-6. Trends in number of people participating and number of participation days for selected outdoor recreation activities in the United States, 1999-2008. Excerpted from Cordell, Betz et al 2008. Source: NSRE 1999-2001 (n=52607) and 2005-2008 (n=19,186). Note: 1999-2001 participants based on 214.0 million people age 16+ (2000 Census). 2005-2008 participants based on 230.0 million people age 16+ (2006 Census estimate). Missing data indicate that either participation or annual days were not collected during that time period.

Activity	Total U.S. Participants (1,000s), 2005-2008	Percent Change in Participants, 1999-2001 to 2005-2008	Total Annual Participant Days (millions), 2005-2008	Percent change in Total Days, 1999-2001 to 2005-2008
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

3.1.2. Effects Analysis

Recreation Opportunity Spectrum and Recreation Niche Settings

The number of miles of proposed OHV systems in each ROS setting for each of the action alternatives is shown in Tables 3-7, 3-8 and 3-9. In Alternatives 2, 3 and 4, all proposed systems are in roaded natural and roaded modified settings both of which are compatible with OHV use.

All proposed OHV systems are in the "neighbor-woods" recreation niche setting. OHV use is compatible with this niche setting.

Table 3-7. Miles of proposed roads and trails by proposed OHV system and ROS setting in Alternative 2. Total miles displayed in this table vary slightly from the totals in Chapter 2 due to rounding of different data sets.

Proposed OHV System and Route Type	Roaded Natural	Roaded Modified
Bear Creek Roads	0.0	0.0
Bear Creek Trails	0.0	39.1
Gibson Roads	0.0	6.9*
Gibson Trails	0.3	8.0*
LaDee Roads	5.7	31.6
LaDee Trails	0.0	1.6
McCubbins Roads	0.0	13.5
McCubbins Trails	0.5	36.6
Peavine Roads	5.7	28.8
Peavine Trails	1.4	1.6
Rock Creek Roads	0.8	30.5
Rock Creek Trails	0.4	7.9
Total Road Miles	12.2	111.3
Total Trail Miles	2.6	94.8

*Note: 1.9 miles of the North Section Line Trail (existing trail) and 0.2 miles of existing road are in The Dalles Watershed. This mileage is included in the Roaded Modified data shown in this table.

Table 3-8. Miles of proposed roads and trails by proposed OHV system and ROS setting in Alternative 3. Total miles displayed in this table vary slightly from the totals in Chapter 2 due to rounding of different data sets.

Proposed OHV System and Route Type	Roaded Natural	Roaded Modified
Bear Creek Roads	0.0	10.5
Bear Creek Trails	0.0	28.8
Gibson Roads	0.0	4.6
Gibson Trails	0.0	0.3
Graham Pass Roads	0.5	52.3
Graham Pass Trails	0.0	10.4
LaDee Roads	13.5	23.1
LaDee Trails	0.2	5.0
McCubbins Roads	0.0	20.4
McCubbins Trails	0.5	39.1
Mt. Defiance Roads	0.0	5.5

Table 3-8. (continued)

Proposed OHV System and Route Type	Roaded Natural	Roaded Modified
Mt. Defiance Trails	0.0	0.0
Peavine Roads	0.3	40.3
Peavine Trails	0.7	8.5
Rock Creek Roads	7.3	45.2
Rock Creek Trails	0.4	8.3
Total Road Miles	21.6	201.9
Total Trail Miles	1.8	100.4

Table 3-9. Miles of proposed roads and trails by proposed OHV system and ROS setting in Alternative 4. Total miles displayed in this table vary slightly from the totals in Chapter 2due to rounding of different data sets.

Proposed OHV System and Route Type	Roaded Natural	Roaded Modified
LaDee Roads	0.6	19.5
LaDee Trails	0.0	5.0
McCubbins Roads	0.0	7.3
McCubbins Trails	0.5	25.7
Rock Creek Roads	0.8	31.1
Rock Creek Trails	0.4	4.9
Total Road Miles	1.4	57.9
Total Trail Miles	0.9	35.6

Forest Plan Amendment

Alternatives 2, 3 and 4 would prohibit cross-country motorized travel by incorporating Forest Plan Amendment #17. In areas of the Forest where such use is not prohibited by law or regulation, the Forest Plan currently states that, "opportunities for OHV use should be available except where not allowed by management direction or where determined to adversely impact land capability and resource values" (US Forest Service 1990, FW-465, p. Four-99). This standard establishes a high threshold for legal cross-country motor vehicle travel. Most cross-country OHV use in the Forest impacts some resource value and therefore violates this standard. While the proposed amendment would seem to reduce recreation opportunities, in a practical sense, it would have very little effect on opportunities that are environmentally sustainable and acceptable.

Quality of OHV Experience

The following is an analysis of Key Issue 1 (Section 1.10.1) – A reduction of motorized routes may result in an insufficient miles of trails to make the OHV experience worthwhile.

Measure and Analysis Methodology

Successful OHV systems provide sufficient distance for the customary duration of the recreation visit. Depending on trail difficulty and the skill of the rider, motorcyclists may ride 25 to 100 miles per day, and four-wheel ATV riders may travel 15 to 80 miles per day. For many four-wheel vehicle drivers, the time spent navigating a few difficult miles provides a quality experience (Crimmins 2006). A 1999 Colorado study by Crimmins concluded that most riders would prefer trail systems at least 29 miles in length in order to provide a variety of scenery and terrain types to reduce the temptation to create new routes (Stokowski 2000).

The alternatives were evaluated by measuring and comparing the number of miles of connected routes (roads and trails) in each proposed system by each vehicle class. To provide a basis of comparison for this issue, a qualitative descriptor (inadequate, moderately adequate, and adequate) 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 by proposed system for a one-day trip (Table 3-10).

Table 3-10. Qualitative description of the adequacy of an OHV experience based solely on the number of connected miles in a route system for each vehicle class. Note: the number of miles that describes the lower boundary of "moderately adequate" is from Stokowski (2000); the number of miles dividing "moderately adequate" from "adequate" is based on anecdotal information.

Experience	Miles - Class I	Miles - Class II	Miles - Class III
Inadequate	less than 29	depends on difficulty	less than 29
Moderately Adequate	29 – 40	depends on difficulty	29 – 50
Adequate	more than 40	depends on difficulty	more than 50

Direct and Indirect Effects – Quality of OHV Experience

Alternative 1

In Alternative 1, there would be approximately 2,463 miles of single-lane, native and gravel surface roads open to all vehicle classes in the short term. In terms of distance alone, the system of gravel and native surface roads would provide an adequate recreation experience for one or more days. In the long term, the total number of available miles would diminish as Forest roads are closed by decisions resulting from other analysis processes.

Alternative 1 would also offer limited (48.5 miles) OHV trail opportunities as shown in Table 3-11. The North Section Line, Rhododendron Ridge, and Rocky Butte Trails are not interconnected. Each trail by itself would provide an inadequate one-day experience. These trails, however, are connected to the Forest's gravel and native surface road system. Collectively, the road and trail system would provide an adequate one or more day recreation experience.

The McCubbins Gulch trail system would provide a moderately adequate one-day experience for Class I and Class III vehicles. These trails are also connected to the Forest's gravel and native surface road system. Collectively, the road and trail system would provide an adequate one or more day experience.

Table 3-11. Motorized trails in Alternative 1. The route system for Class I and III vehicles providing only a moderately adequate one-day experience is italicized; route systems for Class I and III vehicles providing an inadequate one-day experience are not italicized.

Trail Name	Trail Number(s)	Miles	Vehicle Class(s) Permitted
McCubbins Gulch	575, 576, 577	32.0	Class I and Class III
North Section Line	451	4.0	Class III
Rhododendron Ridge	564	10.4	Class III
Rocky Butte	476	2.1	Class III
Total		**48.5**	

Alternative 2

Only one proposed OHV system would provide a sufficient number of connected route miles to offer an adequate experience in Alternative 2 (Table 3-12). McCubbins Gulch would provide an adequate one-day experience for Class I vehicles in both the short term and the long term. McCubbins Gulch would also provide an adequate one-day experience for motorcycles (Class III) in the long term after new trails are constructed.

Proposed LaDee Flats, Peavine and Rock Creek OHV systems would provide a moderately adequate experience for Class I and III vehicles in both the short and long term (Table 3-12). Once constructed, the proposed Bear Creek OHV system would also provide a moderately adequate single-track system. Only the proposed Gibson Prairie OHV system is entirely insufficient in both the short term and the long term for Class I vehicles (Table 3-12).

Routes for Class II vehicles would be available in the LaDee Flats and Peavine proposed OHV systems. Considering distance only, the number of miles offered would probably only provide a moderately adequate experience. The LaDee proposed system, however, offers a hill climb area (North Fork Quarry) that would appeal to some Class II vehicle drivers. Road 4610 (referred to as Abbot Road) also provides a more challenging drive in places. The proposed Peavine OHV trails include three miles of new construction, roughly half of which would be constructed to provide a "most difficult" experience.

Table 3-12. Miles of connected OHV roads and trails by vehicle class and proposed system for Alternative 2. "Short term" includes the route miles that are already constructed (motorized mixed-use roads and roads to be converted to motorized trails). "Long term" adds miles of trail proposed for construction. Route systems for Class I and III vehicles providing an adequate one-day experience are shaded in bold; route systems for Class I and III vehicles providing only a moderately adequate one-day experience are italicized; route systems for Class I and III vehicles providing an inadequate one-day experience are not shaded.

Proposed OHV System	Short Term (miles)			Long Term (miles)		
	Class I	Class II	Class III	Class I	Class II	Class III
Bear Creek	0	0	0	0	0	*39.1*
Gibson Prairie	10.9	0	0	15.2	0	0
LaDee Flats	*29.0*	32.8	*29.0*	*30.6*	33.2	*30.6*
McCubbins Gulch	**45.5**	0	*45.5*	**45.5**	0	**50.6**
Peavine	*34.8*	34.8	*34.8*	*37.8*	37.8	*37.8*
Rock Creek	*33.4*	0	*33.4*	*39.6*	0	*39.6*

Alternative 3

Proposed OHV roads and trails in the Graham Pass and Rock Creek systems would be sufficient to provide an adequate experience for both Class I and Class III riders in the short term and the long term (Table 3-13). The proposed Peavine system would also be sufficient in both the short and long term to provide an adequate one-day experience for Class I vehicles. LaDee proposed routes would provide an adequate one-day experience for Class I vehicles in the long term. The McCubbins Gulch system would also be sufficient to provide an adequate one-day experience for Class III vehicle in the long term.

Proposed OHV roads and trails in the LaDee and McCubbins Gulch systems would provide a moderately adequate experience for both Class I and Class III vehicles in the short term (Table 3-13). The Peavine routes would also provide a moderately adequate experience for Class III vehicles in both the short and long term. Class III vehicles would only be provided with a moderately adequate experience in the Bear Creek proposed system in the long run when new trails are constructed.

The proposed OHV roads and trails for the Gibson Prairie and Mt. Defiance systems are insufficient in and of themselves to provide an adequate experience (Table 3-13). In Alternative 3, however, both OHV systems connect to Hood River County trails (see Cumulative Effects discussion).

Class II vehicle routes would be available in the Graham Pass and LaDee systems. LaDee OHV roads, trails and area would probably only provide a moderately adequate experience, considering distance only. The LaDee proposal, however, includes a hill climb area (North Fork Quarry) that would appeal to some Class II vehicle drivers. Road 4610 (referred to as Abbot Road) also provides a more challenging drive in places. The proposed Graham Pass roads and trails, while sufficiently long, are all on motorized mixed-use roads. This experience would appeal to some Class II vehicle drivers and not to others.

Table 3-13. Miles of connected OHV routes by vehicle class and proposed system for Alternative 3. "Short term" includes the route miles that are already constructed (motorized mixed-use roads and roads to be converted to motorized trails). "Long term" adds miles of trail proposed for construction. OHV systems for Class I and III vehicles providing an adequate one-day experience are shaded in bold; OHV systems for Class I and III vehicles providing only a moderately adequate one-day experience are italicized; OHV systems for Class I and III vehicles providing an inadequate one-day experience are not shaded.

Proposed OHV System	Short Term (miles)			Long Term (miles)		
	Class I	Class II	Class III	Class I	Class II	Class III
Bear Creek	0	0	10.5	0	0	39.7
Gibson Prairie	4.6	0	4.6	4.9	0	4.9
Graham Pass	50.6	50.6	63.2	50.6	50.6	63.2
LaDee Flats	36.7	22.2	36.7	42.0	22.5	42.0
McCubbins Gulch	36.1	0	46.0	36.8	0	60.1
Mt. Defiance	5.5	0	5.5	5.5	0	5.5
Peavine	40.5	0	40.5	49.4	0	49.4
Rock Creek	54.6	0	54.6	61.2	0	61.2

Alternative 4

In Alternative 4, none of the proposed systems (LaDee Flats, McCubbins Gulch, and Rock Creek) would offer sufficient miles to constitute an adequate one-day riding experience for either Class I or Class III vehicles (Table 3-14). Both McCubbins Gulch and Rock Creek systems, however, would offer moderately adequate one-day experiences for both Class I and Class III vehicles in the short and long term. The proposed LaDee Flats OHV roads, trails and area would be inadequate in both the short and long term for Class I and Class III vehicles.

Routes are proposed for Class II vehicles only in the LaDee Flats OHV system. Considering distance alone, the routes would probably provide an inadequate one-day driving experience. There is a hill climb area (North Fork Quarry) included in this alternative, however, which would appeal to some Class II vehicle drivers. Road 4610 (Abbot Road) is not included in this alternative, however, which would eliminate an incentive for Class II vehicles to use the system.

Table 3-14. Miles of connected OHV routes by vehicle class and proposed system for Alternative 4. "Short term" includes the route miles that are already constructed (motorized mixed-use roads and roads to be converted to motorized trails). "Long term" adds miles of trail proposed for construction. There are no route systems for Class I and III vehicles providing an adequate one-day experience; OHV systems for Class I and III vehicles providing only a moderately adequate one-day experience are italicized; OHV systems for Class I and III vehicles providing an inadequate one-day experience are not shaded.

Proposed OHV System	Short Term (miles)			Long Term (miles)		
	Class I	Class II	Class III	Class I	Class II	Class III
LaDee Flats	20.1	13.4	20.1	25.1	13.5	25.1
McCubbins Gulch	32.9	0	32.9	33.6	0	33.6
Rock Creek	34.1	0	34.1	37.3	0	37.3

Cumulative Effects – Quality of OHV Experience

In Alternative 1, the Forest's gravel and native surface road system connects to roads on private lands and on lands administered by the Bureau of Land Management along the western boundary of the Forest (south of Estacada and north of Opal Creek), an area popularly referred to as Goat Mountain. The number of connected miles open to OHVs on other ownerships in this vicinity is considerable, but is not known precisely. The Forest's gravel and native surface road system also connects with roads and trails open to Class I and Class III vehicles on lands administered by Hood River County north of Gibson Prairie and also east of Mt. Defiance. There are 89 miles of roads and 64 miles of trails open to OHVs on Hood River County lands that connect to National Forest system routes east of Mt. Defiance. For the area north of Gibson Prairie, there are 79 miles of roads and 63 miles of trails (across three ownerships: SDS, Longview Timber, Hood River County) open to OHV use that connect to proposed National Forest System routes. With or without these connections to routes on other jurisdictions, Alternative 1 routes in the Mt. Hood National Forest would provide an adequate one or more day recreation experience considering distance alone.

In Alternative 3, proposed OHV roads and trails would connect with roads and trails (open to Class I and Class III vehicles) on lands administered by Hood River County (north of Gibson Prairie and east of Mt. Defiance). There are 89 miles of roads and 64 miles of trails open to OHVs on Hood River County lands that connect to proposed National Forest system routes east of Mt. Defiance. For the area north of Gibson Prairie, there are 79 miles of roads and 63 miles of trails (across three ownerships: SDS, Longview Timber, Hood River County) open to OHV use that could connect to proposed National Forest System routes. Without these connections, the National Forest route systems proposed for both the Gibson and Mt. Defiance areas would not provide an adequate one-day recreation experience. With the connections, each route systems would be fully adequate.

There are no cumulative effects for Alternatives 2 and 4.

The Forestwide Road Decommissioning for Aquatic Restoration project (2009) and the Clackamas Road Decommissioning for Habitat Restoration project (2009) proposed to decommission roads that are no longer needed for the administration of the National Forest. These decisions, as well as future road decommissioning projects, reduce the number of miles of roads available for OHV use in Alternative 1.

OHV System Layout

The following is an analysis of Key Issue 1 (Section 1.10.1) – Having multiple-class OHV routes may result in a diminished recreation experience for miles; restricting some routes to a single OHV class may affect mixed OHV groups, such as families and OHV club groups.

Measure and Analysis Methodology

OHV users are a diverse group with varying desires and expectations. Not all vehicle classes of OHVs 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 (Moore 1994).

This issue is of particular concern for four-wheel ATVs and motorcycle riders. Some motorcycle enthusiasts want single-track trails. Maintaining trails for this experience necessitates excluding four-wheel ATVs. On the other hand, it is common for a family or friends to visit the Forest with more than one vehicle class of OHV in tow. Such a group usually would prefer routes open to more than one class of vehicle.

Alternatives were evaluated by comparing the following data: (1) the number of miles of connected routes (by proposed system) that would allow any single vehicle class alone; and (2) the number of miles of connected routes that would be open to more than one vehicle class.

Direct and Indirect Effects – OHV System Layout

Alternative 1

As displayed in Table 3-15, Alternative 1 would far exceed all other alternatives in the number of route miles available for all OHV classes together (approximately 2,463 miles). For family and other groups with more than one kind of vehicle, Alternative 1 would offer the most opportunities to ride together (measured in distance only).

Alternative 1 ranks higher than Alternative 4 and lower than Alternatives 2 and 3 for groups wanting to ride motorcycles on single-track trails. The routes designated solely for Class III vehicles in Alternative 1 would be the Rhododendron Ridge Trail (10.4 miles), North Section Line Trail (4.0 miles) and the Rocky Butte Trail (2.1 miles).

There would be nearly 32 miles of road and trail where Class I and III vehicles could ride together on the same road or trail (McCubbins Gulch Trails) making Alternative 1 the lowest ranking alternative for this opportunity. Also, Alternative 1 would provide no routes solely for Class I or Class II vehicles.

Table 3-15. Number of miles of connected routes (by proposed system) in Alternative 1 for several combinations of vehicle classes. Mileages do not include off-road and off-trail riding opportunities.

Proposed OHV System	Class I Only	Class II Only	Class III Only	Class I & III Only	Class I, II, & III
Forest Roads	0	0	0	0	2,463
McCubbins Trails	0	0	0	32.0	0
N. Section Line Tr.	0	0	4.0	0	0
Rho. Ridge Trail	0	0	10.4	0	0
Rocky Butte Trail	0	0	2.1	0	0
TOTAL	**0.0**	**0.0**	**16.5**	**32.0**	**2,463**

Alternative 2

Alternative 2 is the only alternative that would designate routes for Class I (Gibson Prairie routes) and Class II (Road 4610 in LaDee Flats) vehicles alone (Table 3-16). This alternative provides the best opportunity to enhance routes in the long term solely for quads and four-wheel drive vehicles.

Alternative 2 ranks second in the number of miles of roads and trails where motorcycles would be the only vehicle class allowed. With 44.2 miles of Class III only routes, Alternative 2 would designate slightly more than half the number of miles (59%) proposed in Alternative 3 (75.6 miles). Considering single-track opportunities only, Alternatives 2 compares somewhat more favorably against Alternative 3. All 44.2 miles in Alternative 2 would be single-track trails. In Alternative 3, only 65.5 miles of newly constructed trail and converted roads would be managed as single-track trail in the long term (the remainder of the Class III routes only would be motorized mixed-use routes). For Bear Creek, Alternative 2 and Alternative 3 systems would be roughly the same lengths (39.1 miles in Alternative 2; 39.3 miles in Alternative 3).

Alternative 2 also ranks second among the alternatives when comparing the number of route miles proposed for Class I and Class III vehicles on the same routes. Alternative 2 ranks a distant third to Alternative 1 when comparing the number of miles that would be available to all vehicle classes sharing the same routes.

Table 3-16. Number of miles of connected routes (by proposed system) proposed in Alternative 2 for several combinations of vehicle classes. Mileages correspond to long-term management, after all new trail construction.

Proposed OHV System	Class I Only	Class II Only	Class III Only	Class I & III	Class I, II, & III
Bear Creek	0	0	39.1	0	0
Gibson Prairie	15.2	0	0	0	0
LaDee Flats	0	8.3	0	5.7	24.9
McCubbins Gulch	0	0	5.1	45.5	0
Peavine	0	0	0	0	37.8
Rock Creek	0	0	0	39.6	0
TOTAL	**15.2**	**8.3**	**44.2**	**90.8**	**62.7**

Alternative 3

From the standpoint of OHV recreation, Alternative 3 rates highest among the alternatives in two ways (Table 3-17). First, it would provide the greatest number of miles of Class III-only routes (75.6 miles) and the greatest number of single-track miles in the long term (65.5 miles). This alternative would probably be most appealing to motorcycle riders looking for routes managed exclusively for Class III vehicles.

Second, Alternative 3 would provide the greatest number of miles of routes that could be shared by Class I and Class III vehicles (177.3 miles). Although Alternative 1 would offer more route miles that could be shared by all classes of vehicles, Alternative 3 would offer the most miles that would be managed as trails in the long term for all vehicle classes. This alternative would probably be most appealing to groups that have more than one vehicle class and who prefer trail riding.

Table 3-17. Number of miles of connected routes (by proposed system) proposed in Alternative 3 for several combinations of vehicle classes. Mileages correspond to long-term management, after all new trail construction.

Proposed OHV System	Class I Only	Class II Only	Class III Only	Class I & III	Class I, II, & III
Bear Creek	0	0	39.7	0	0
Gibson Prairie	0	0	0	4.9	0
Graham Pass	0	0	12.6	0	50.6
LaDee Flats	0	0	0	19.5	22.5
McCubbins Gulch	0	0	23.3	36.8	0
Mt. Defiance	0	0	0	5.5	0
Peavine	0	0	0	49.4	0
Rock Creek	0	0	0	61.2	0
TOTAL	**0**	**0**	**75.6**	**177.3**	**73.1**

Alternative 4

With respect to route sharing, Alternative 4 is inferior to the other alternatives by several measures (Table 3-18). Alternative 4 is unique among the alternatives in providing no designated routes exclusively for Class III vehicles. This alternative would likely be least appealing to motorcycle riders that prefer single-track experiences or that simply prefer routes dedicated to their sport.

As in Alternatives 1 and 3, Alternative 4 would designate no routes exclusively for Class I or Class II vehicles (Table 3-18). Only Alternative 2 would designate a modest number of routes exclusively for each of these vehicle classes (Table 3-16).

Alternative 4 ranks third in the number of shared routes proposed for Class I and III vehicles. Alternative 4 would designate 82.5 miles, compared to Alternative 3 which would designate more than twice as many (177.3 miles). Alternative 4 would designate fewer shared routes for all vehicle classes than Alternative 3 in each of the three proposed system that are common to the two alternatives (LaDee Flats, McCubbins Gulch, and Rock Creek).

Table 3-18. Number of miles of connected routes (by proposed system) proposed in Alternative 4 for several combinations of vehicle classes. Mileages correspond to long-term management, after all new trail construction.

Proposed OHV System	Class I Only	Class II Only	Class III Only	Class I & III	Class I, II, & III
LaDee Flats	0	0	0	11.7	13.5
McCubbins Gulch	0	0	0	33.6	0
Rock Creek	0	0	0	37.2	0
TOTAL	**0**	**0**	**0**	**82.5**	**13.5**

Cumulative Effects – OHV System Layout

Two Hood River County areas adjacent to the Forest provide approximately 295 miles of road and trails for various combinations of vehicle classes. Hood River County's Northwest Area offers 153 miles of roads and trails, and specific trails have been assigned to quad and motorcycle use. Included in this total is 89 miles of roads that are open to all vehicle classes. The County's Eastside Area provides a total of 142 miles of roads and trails including 79 road miles that are open to all vehicle classes. The trails in the Eastside Area (approximately 63 miles) have not yet been assigned to specific vehicle classes.

The Hood River County OHV system would be available for motorized recreation in all of the alternatives described in this EIS. In Alternative 3, however, the Hood River County routes would connect directly to proposed National Forest system routes: Eastside Area routes would connect directly to proposed Gibson Prairie routes in the National Forest; Northwest Area routes would connect to proposed Mt. Defiance routes. Table 3-19 displays the cumulative number of miles that would be available for each combination of vehicle classes in Alternative 3.

The effect of directly connecting Hood River County routes to National Forest system routes in Alternative 3 would be to enhance the opportunities for quad-only, motorcycle-only, and combination route experiences. The only motorized experience that is not enhanced in Alternative 3 would be opportunities for vehicle Class II only. It should be noted that not all quad and motorcycle routes in the Hood River County system are connected.

Table 3-19. Approximate OHV route miles in Hood River County (Eastside Area and Northwest Area) combined with proposed National Forest system routes in the Gibson Prairie and Mt. Defiance locations for several combinations of vehicle classes in Alternative 3. The approximately 63 miles of trail in the Eastside area have not yet been assigned to specific vehicle classes. Mileages were estimated with a map measure.

Proposed OHV System	Class I Only	Class II Only	Class III Only	Class I & III Only	Class I, II, & III
Gibson Prairie - Eastside Area	unknown	0	unknown	4.9	79.0
Mt. Defiance - Northwest Area	17.4	0	46.6	5.5	89.0

Loop Opportunities

The following is an analysis of Key Issue 1 (Section 1.10.1) – Designating OHV routes with dead-ends may adversely affect the motorized recreation experience.

Measure and Analysis Methodology

Loop trails provide diversity for OHV enthusiasts. Dead-end routes may be desirable if they lead to an outstanding feature or destination. Even so, loop routes provide a superior recreation experience. In-and-out (dead end) routes are generally considered less enjoyable, a situation that may contribute to undesirable behaviors and unacceptable impacts such as driving off of proposed routes (Crimmins 2006).

The number of dead-end routes, the number of miles of dead-end routes, and the percentage of total route miles in both the short term and the long term were used to compare alternatives. Mileages were estimated using a map measure.

Direct and Indirect Effects – Loop Opportunities

Alternative 1

In Alternative 1, OHVs could access approximately 182 dead-end routes totaling 633 miles, or 28% of the proposed route network. This percentage is substantially higher than the percentages in Alternatives 2, 3 or 4 after all new construction is completed. Although this percentage is high, because the total number of potential route miles is so much greater in Alternative 1 than in any of the other alternatives, the **number** of miles of routes that would **not** lead to dead ends is also far greater than in the other alternatives.

Alternative 2

Comparing miles of dead-end routes that would be available in the long term in Alternatives 2, 3 and 4 (Table 3-20), Alternative 2 would have a higher percentage of dead-end routes (10%) than either Alternatives 3 or 4 (9% and 3%, respectively). Numbers only tell part of the story, however. Some dead-end routes were designed into this alternative to provide unique recreation opportunities for certain OHV enthusiasts. In the LaDee Flats OHV system, a dead-end route leads to North Fork Quarry that is used as a hill climb area. Another dead end route is Road 4610 (Abbot Road) that has outstanding views and a higher degree of challenge. Because of this road's juxtaposition to the Salmon Huckleberry Wilderness and the Roaring River roadless area, designing a loop return route would not be feasible. In the Peavine location, the three dead-end routes lead to viewpoints on West Pinhead Butte and Peavine Mountain.

In Alternative 2, as in Alternatives 3 and 4, achieving the route system described in the long term would require constructing new trails. How quickly that would be achieved depends upon a number of factors. Before new trail construction, the route system would be much more disconnected with many more undesirable dead end routes. The short-term data in Table 3-20 reflects the situation that would appear on the first MVUM if Alternative 2 were selected. In the short term, among the three action alternatives, Alternative 2 would have the highest percentage (41%) of route miles leading to dead ends.

Table 3-20. Number of dead-end routes and miles of dead-end routes, both short term and long term, by proposed system in Alternative 2. "Short term" includes the route miles that are already constructed (motorized mixed-use roads and roads to be converted to motorized trails). "Long term" adds miles of trail proposed for construction.

Proposed OHV System	Short Term			Long Term		
	# Routes	# Miles	% Miles	# Routes	# Miles	% Miles
Bear Creek	0	0	0	0	0	0
Gibson Prairie	4	10.9	100	0	0	0
LaDee Flats	11	31.5	84	3	20.0	51
McCubbins Gulch	0	0	0	0	0	0
Peavine	10	10.9	31	3	2.2	6
Rock Creek	13	12.9	39	0	0	0
TOTAL	**38**	**66.2**	**41**	**6**	**22.2**	**10**

Alternative 3

Alternative 3 would have only a slightly lower percentage of dead-end route miles (9%) than Alternative 2 (10%) in the long term (Table 3-21). Alternative 3 would have a higher percentage of dead-end route miles than Alternative 4 (3%). The dead-end routes that were designed into Alternative 3 include some of the same routes as in Alternative 2 (North Fork Quarry and Road 4610 in the LaDee Flats OHV system; Peavine Mountain in the Peavine OHV system). The Rock Creek system also would include two key dead-end routes in the long term. Road 4860-140 to Badger Lake would continue to provide access to a rustic campground that is currently popular with some OHV riders. The long in-and-out route between Road 4811 and Sportsman's Park would serve primarily as direct access to the Rock Creek routes for OHV enthusiasts living in that residential area. For non-residents, this dead-end route would not be particularly desirable.

Before new trail construction, the route system in Alternative 3 would be moderately disconnected with many undesirable dead-end routes. The short-term data in Table 3-21 reflects the situation that would appear on the first MVUM if Alternative 3 were selected. In the short term, Alternative 3 would have a lower percentage (38%) of route miles leading to dead-ends than Alternative 2 (41%). Alternative 3 and 4 would have the same percentage of dead-end route miles (38%).

Table 3-21. Number of dead-end routes and miles of dead-end routes, both short term and long term, by proposed system in Alternative 3. "Short term" includes the route miles that are already constructed (motorized mixed-use roads and roads to be converted to motorized trails). "Long term" adds miles of trail proposed for construction.

Proposed OHV System	Short Term			Long Term		
	# Routes	# Miles	% Miles	# Routes	# Miles	% Miles
Bear Creek	6	10.5	100	0	0	0
Gibson Prairie	1	4.9	100	0	0	0
Graham Pass	0	0	0	0	0	0
LaDee Flats	11	31.5	86	2	19.6	47
McCubbins Gulch	17	17.5	38	0	0	0
Mt. Defiance	0	0	0	0	0	0
Peavine	23	17.2	42	1	0.2	0.5
Rock Creek	24	20.4	50	2	9.4	15
TOTAL	**82**	**102.0**	**39**	**5**	**29.2**	**9**

Alternative 4

Alternative 4 would have a substantially lower percentage of dead-end route miles (3%) than either Alternatives 2 or 3 (10% and 9%, respectively) in the long term (Table 3-22). Alternative 4 would only include one dead-end route in the final design: the road to North Fork Quarry, a popular hill climb area in the LaDee Flats proposed OHV system.

Before new trail construction, the route system in Alternative 4 would be moderately disconnected with many undesirable dead-end routes. The short-term data in Table 3-22 reflects the situation that would appear on the first MVUM if Alternative 4 were selected. In the short term, Alternative 3 and 4 would have the same percentage of dead-end route miles (38%). Alternative 4 would have a lower percentage (38%) of route miles leading to dead-ends than Alternative 2 (41%).

Table 3-22. Number of dead-end routes and miles of dead-end routes, both short term and long term, by proposed system in Alternative 4. "Short term" includes the route miles that are already constructed (motorized mixed-use roads and roads to be converted to motorized trails). "Long term" adds miles of trail proposed for construction.

Proposed OHV System	Short Term			Long Term		
	# Routes	# Miles	% Miles	# Routes	# Miles	% Miles
LaDee Flats	10	15.2	76	1	3.3	13
McCubbins Gulch	4	4.2	13	0	0	0
Rock Creek	12	13.7	40	0	0	0
TOTAL	**26**	**33.1**	**38**	**1**	**3.3**	**3**

Cumulative Effects – Loop Opportunities

In Alternative 1, the Forest's gravel and native surface road system connects to numerous potential OHV routes on lands managed by other agencies. The routes administered by the Bureau of Land Management on the west boundary of the Forest and the routes in Hood River County are particularly popular with OHV enthusiasts. An unknown number of these routes lead to dead-ends.

An unknown number of dead-end routes in Hood River County would affect the recreation experience in Alternative 3 as well. The Forest routes in the Gibson and Mt. Defiance systems were designed specifically to connect to these routes outside the Forest.

None of the proposed routes in either Alternative 2 or Alternative 4 would interconnect with OHV routes outside the Forest, so there are no cumulative effects for these alternatives.

Diversity in Trail Difficulty

The following is an analysis based on concerns that failure to designate routes with specialized terrain or physical features may exclude certain motorized sports.

Measure and Analysis Methodology

For many OHV enthusiasts, the challenge offered by the route or terrain features is as important as the length of the ride. Different terrain features challenge each of the vehicle classes. Route width and grade also affect both diversity and difficulty. Motorcycles are challenged by the width of the track, and four-wheel drive vehicles are challenged by rock climbs. Mud bogs and hill climbs are specific features that some OHV enthusiasts enjoy. Route diversity, including horizontal and vertical dips and turns, can be designed into new trail construction. Existing roadways that currently offer only easy riding can be actively or passively managed to increase both diversity and difficulty. Virtually all riders look for diversity in experiences and activities (Crimmins 2006).

An ideal OHV route system layout would include between 10% to15% of route miles built and maintained for an "easier" riding experience; between 10% to15% of route miles built and maintained for the "most difficult" riding experience; and the remaining 70% to 80% of route miles built and maintained for a "more difficult" riding experience (Crimmins 2006). The alternatives in this analysis were measured and compared against this template. The criteria for the three difficulty ratings are contained in the Forest Service Trails Handbook, FSH 2309.18, and include variations in trail grade, surface and clearing. Mileages were estimated using a map measure.

The alternatives were also compared based on access to specific terrain features (i.e., hill climbs and open areas) and whether night riding would be allowed.

Direct and Indirect Effects – Diversity in Trail Difficulty

Alternative 1

Comparing the roads and trails that would be open to OHV use in each of the alternatives, Alternative 1 would provide the greatest total miles but the least diversity, complexity and difficulty (Table 3-23). Only the trail system at McCubbins Gulch and three other non-connected trails (North Section Line, Rhododendron Ridge, and Rocky Butte) would provide a "more difficult" riding experience and only for Class I and Class III vehicles.

Table 3-23. Route miles (native surface, single-lane gravel roads and trails) and percentage of total proposed connected routes Forestwide for three difficulty levels in Alternative 1.

Proposed OHV System	Route Difficulty	Route Miles Long Term	% of Total Connected Miles
Forestwide	Easier	2,463	98
	More Difficult	48.5	2
	Most Difficult	0	0

Permitting travel off of roads and trails increases the difficulty level of this alternative. It is difficult to drive off-road in the Forest without violating prohibitions against resource damage, however. There is no comparable opportunity in any of the action alternatives.

Alternative 1 ranks as moderately diverse and challenging for OHV enthusiasts based on the availability of some specialized terrain features and opportunities. Use of popular mud bog areas at LaDee Flats would continue to be prohibited. Road 4610 would continue to be accessible to all classes of vehicles. Night riding would continue to be permitted.

Alternative 2

Alternatives 2, 3 and 4 have similar **percentages** of proposed route miles in each of the difficulty categories (Table 3-24, Table 3-25, and Table 3-26). Overall, Alternative 2 has a slightly higher percentage of "more difficult" routes than either Alternative 3 or Alternative 4 in the long term. That percentage (44%), however, is substantially below the proportion of "more difficult" routes recommended in a planned OHV system (Crimmins 2006). This situation is due in large part to the motorized mixed-use roads that constitute one-third of the proposed route miles and which are all "easier" routes.

Designing some "easier" loops in each proposed system contributed to the high total percentage of "easier" routes in Alternative 2. For example, one of the new loops in the proposed Bear Creek system would be constructed and maintained as an "easier" route in order to provide the full range of difficulty levels in this system. Doing so elevates the overall percentage of "easier" routes beyond the ideal range. The route system proposed in Alternative 2 would likely appeal to beginning riders and family groups with younger members. The overall percentage of "most difficult" routes is in the recommended range described by Crimmins (2006); however the shortage of "more difficult" routes may discourage use by both intermediate and advanced riders.

Table 3-24. Route miles and percentage of total proposed connected routes by proposed system for three difficulty levels in Alternative 2. Construction and maintenance standards for each difficulty level are found in Forest Service Handbook 2309.18. Assumes road-to-trail conversions have reached desired difficulty objective and all new trails have been constructed.

Proposed OHV System	Route Difficulty	Route Miles Long Term	% of Total Connected Miles (by system)
Bear Creek	Easier	7.1	18
	More Difficult	24.9	64
	Most Difficult	7.1	18
Gibson Prairie	Easier	6.6	43
	More Difficult	8.6	57
	Most Difficult	0	0
LaDee Flats	Easier	24.1	62
	More Difficult	5.9	15
	Most Difficult	8.9	23
McCubbins Gulch	Easier	13.7	27
	More Difficult	36.9	73
	Most Difficult	0	0
Peavine	Easier	19	50
	More Difficult	13.5	36
	Most Difficult	5.3	14
Rock Creek	Easier	27.6	70
	More Difficult	7.7	19
	Most Difficult	4.3	11
Combined	Easier	98.1	44
	More Difficult	97.5	44
	Most Difficult	25.6	12

North Fork Quarry would be available for its short hill climbs. The percentage of local OHV enthusiasts who seek out this particular specialized setting is not known. Anecdotal evidence indicates that it is used frequently. Easy access to the Portland/Vancouver Metropolitan area and relatively low elevation enables year around access. Road 4610 (Abbot Road) would be open to OHV use in Alternative 2 allowing use of one of the more technical 4-wheel driveways in the Forest.

Alternative 2 would permit OHV use day or night as is currently allowed. The percentage of local OHV enthusiasts who seek out this experience is not known, however anecdotal evidence indicates that some riders do so. Allowing night riding would broaden the range of OHV experiences compared to Alternative 4 in which night riding would not be permitted.

Alternative 3

As previously discussed, the three action alternatives have similar **percentages** of proposed route miles in each of the difficulty categories in the long term (Table 3-24, Table 3-25, and Table 3-26). Among the action alternatives, Alternative 3 has the lowest percentage of "more difficult" routes (41%) and the highest percentage of "easier" routes (48%). Both percentages are substantially outside the recommended guidelines for a planned OHV system as described by Crimmins (2006). This situation is due in large part to the motorized mixed-use roads that constitute 40% of the proposed route miles and which are all "easier" routes. The overall percentage of "easier" routes in this alternative also results from designing some "easier" loops in each proposed system. For example, as in Alternative 2, one of the new loops in the proposed Bear Creek system would be constructed and maintained as an "easier" route in order to provide the full range of difficulty levels in this system. Doing so elevates the overall percentage of "easier" routes outside the ideal range. The route system proposed in Alternative 3 would likely appeal to beginning riders and family groups with younger members. The overall percentage of "most difficult" routes is in the range recommended by Crimmins (2006); however the shortage of "more difficult" routes may discourage use by intermediate and advanced riders. The higher total route miles that would be available in Alternative 3 would augment the overall difficulty level.

North Fork Quarry would be available for its short hill climbs. The percentage of local OHV enthusiasts who seek out this particular specialized setting is not known. Anecdotal evidence indicates that it is used frequently. Easy access to the Portland/Vancouver Metropolitan area and relatively low elevation enables year around access. Road 4610 (Abbot Road) would be open to OHV use in Alternative 3 allowing use of one of the more technical 4-wheel driveways in the Forest.

Alternative 3 would permit OHV use day or night as is currently allowed. The percentage of local OHV enthusiasts who seek out a night riding experience is not known, however anecdotal evidence indicates that some riders do so. Allowing night riding would broaden the range of OHV experiences compared to Alternative 4 in which night riding would not be permitted.

Table 3-25. Route miles and percentage of total proposed connected routes by proposed system for three difficulty levels in Alternative 3. Construction and maintenance standards for each difficulty level are found in Forest Service Handbook 2309.18. Short-term mileages include new trail construction; and all road-to-trail conversions assumed to be "easier" difficulty level. Long-term mileages assume road-to-trail conversions have reached desired difficulty objective.

Proposed OHV System	Route Difficulty	Route Miles Long Term	% of Total Connected Miles (by system)
Bear Creek	Easier	10	25
	More Difficult	24.3	62
	Most Difficult	5	13
Gibson Prairie	Easier	4.9	100
	More Difficult	0	0
	Most Difficult	0	0
Graham Pass	Easier	52.8	84
	More Difficult	10.4	16
	Most Difficult	0	0
LaDee Flats	Easier	20.9	50
	More Difficult	12.2	29
	Most Difficult	8.9	21
McCubbins Gulch	Easier	13.6	23
	More Difficult	37.5	62
	Most Difficult	9	15
Mt. Defiance	Easier	5.5	100
	More Difficult	0	0
	Most Difficult	0	0
Peavine	Easier	13.1	26
	More Difficult	28.6	58
	Most Difficult	7.7	15
Rock Creek	Easier	35.1	57
	More Difficult	18.8	31
	Most Difficult	7.3	12
Combined	**Easier**	**155.9**	**48**
	More Difficult	**131.8**	**41**
	Most Difficult	**37.9**	**12**

Alternative 4

As previously discussed, Alternatives 2, 3 and 4 have similar **percentages** of proposed route miles in each of the difficulty categories in the long term (Table 3-24, Table 3-25, and Table 3-26). Overall, Alternative 4 has a slightly higher percentage of "more difficult" routes than Alternative 3 and a slightly lower percentage than Alternative 2. This percentage (43%), however, is substantially below the proportion of "more difficult" routes recommended in a planned OHV system by Crimmins (2006). This situation is due in large part to the motorized mixed-use roads that constitute one-third of the proposed route miles and which are all "easier" routes.

Table 3-26. Route miles and percentage of total proposed connected routes by proposed system for three difficulty levels in Alternative 4. Construction and maintenance standards for each difficulty level are found in Forest Service Handbook 2309.18. Short-term mileages include new trail construction; and all road-to-trail conversions assumed to be "easier" difficulty level. Long-term mileages assume road-to-trail conversions have reached desired difficulty objective.

Proposed OHV System	Route Difficulty	Route Miles Long Term	% of Total Connected Miles (by system)
LaDee Flats	Easier	9.2	37
	More Difficult	7.0	28
	Most Difficult	9.0	36
McCubbins Gulch	Easier	10.7	32
	More Difficult	22.9	68
	Most Difficult	0	0
Rock Creek	Easier	20.6	55
	More Difficult	11.8	32
	Most Difficult	4.9	13
Combined	Easier	40.5	42
	More Difficult	41.7	43
	Most Difficult	13.9	14

The high percentage of "easier" routes in this alternative also resulted from designing some "easier" loops in each proposed system. For example, one of the loops in the proposed Rock Creek system would be constructed and maintained as an "easier" route in order to provide the full range of difficulty levels in this system. Doing so elevates the overall percentage of "easier" routes beyond the ideal range. The route system proposed in Alternative 4 would likely appeal to beginning riders and family groups with younger members. The overall percentage of "most difficult" routes is in the range recommended by Crimmins (2006); however the shortage of "more difficult" routes may discourage use by intermediate and advanced riders.

Like Alternatives 2 and 3, Alternative 4 would officially open North Fork Quarry for its short hill climbs. The percentage of local OHV enthusiasts who seek out this particular specialized setting is not known. Anecdotal evidence indicates that it is used frequently. Easy access to the Portland/Vancouver Metropolitan area and relatively low elevation enables year around access. Road 4610 (Abbot Road) would **not** be open to OHV use in Alternative 4 eliminating a potential technical four-wheel driveway.

Night riding would be prohibited in Alternative 4, narrowing the range of OHV experiences compared to Alternatives 1, 2 and 3 in which night riding would be permitted.

The combination of a high percentage of "easier" routes, the fewest total available miles, and no night riding make Alternative 4 the least diverse and difficult proposal (among the action alternatives) for OHV enthusiasts. Alternative 1 offers fewer difficult routes and less access to special settings, but offers many more miles.

Cumulative Effects – Diversity in Trail Difficulty

In Alternative 3, the percentages of connected routes in the three difficulty classes change when the Hood River County OHV system is considered. The difficulty levels for the connected Gibson Prairie and Mt. Defiance systems are shown in Table 3-27. Hood River County's Eastside Area routes have not yet been finalized, so an estimate of route difficulties is not possible at this time.

The Hood River County OHV system would be available in Alternatives 1, 2 and 4 also, but they would not be integrated with the Forest's OHV system.

Table 3-27. Route miles and percentage of total proposed connected routes in Hood River County including proposed connections to National Forest system routes in the Gibson Prairie and Mt. Defiance locations for three difficulty levels in Alternative 3.

Proposed OHV System	Route Difficulty	Route Miles Long Term	% of Total Connected Miles
Gibson Prairie	Easier	not determined	not determined
	More Difficult	not determined	not determined
	Most Difficult	not determined	not determined
Mt. Defiance	Easier	95.8	60
	More Difficult	46.2	29
	Most Difficult	16.5	10

Supply and Demand

The following is an analysis based on Key Issue 1 (Section 1.10.1) – Designating OHV routes may not have the capacity to meet the existing or future needs of OHV users.

Measure and Analysis Methodology

Several key measures of OHV popularity indicate an upward trend in both vehicles sales and use days (Cordell 2008; Bergerson et al. 2005). There is a concern that the proposed routes may not be sufficient to accommodate the growth of OHV sports and the likely demand for more access.

Using the proposed staging area capacity for each proposed system (and several key assumptions), estimates of area PAOTs (persons at one time), and available visitor days were generated for each alternative. The estimates were used to compare the alternatives against current OHV use statistics described by English, Kocis and Hales (2004).

Several caveats are pertinent to an evaluation of supply and demand:

1. Information about current OHV use patterns in the Forest is scant. The 2003 National Visitor Use Monitoring (NVUM) study provides a gross, Forestwide estimate of visitor participation in motorized vehicle sports. It does not, however, provide any information about how participation is distributed in time or space. The NVUM also does not indicate what vehicle classes were used at the time of the survey.

2. It is neither necessary nor cost-effective to size staging areas for peak use since there is a substantial variation in seasonal and weekly use levels (Crimmins 2006). Some of the proposed areas are better suited than others to accommodate overflow parking.

3. This analysis is not the final word about OHV route designation in the Forest. Future route designations could be made as a result of future proposals and further NEPA analysis. Also, route designation on lands under other ownership and jurisdiction is also a dynamic situation that affects capacity.

Direct and Indirect Effects – Supply and Demand

Alternative 1

Despite the large number of roads that would be open to OHVs, as well as off-road driving opportunities, the limiting factor in determining supply for Alternative 1 is parking for transport vehicles and trailers. Rock quarries and pits were found to be opportune staging areas in each of the action alternatives, so Forestwide quarries were used to estimate capacity for Alternative 1 as well. There are 61 rock quarries in the Forest. The average quarry size was conservatively estimated to be two acres with a parking capacity of 60 vehicles. It was also assumed that on average, Forest roads would be snow free for six months each year (56 primary days and 126 secondary days). Eighty percent of OHV recreation is assumed to occur on primary days (weekends and holidays).

Alternative 1 would potentially have the capacity to provide approximately 819,840 primary visitor days (weekends and holidays) and 2,664,480 total visitor days for OHV recreation. According to National Visitor Use Monitoring statistics for OHV participation, there are currently about 37,546 recreation visits involving OHV use in the Forest (English, Kocis and Hales 2004). Hence, this alternative would provide excess capacity when compared simply to current demand.

Cordell reported growth of 56.1% nationally for off-road driving participant days from 1999 to 2008 (Cordell, Betz et al. 2008). If local growth in participant days continued to grow at this average national rate, total estimated demand would be 58,609 days in 2018 and 91,489 days in 2028. Assuming 80% of OHV use is on primary days (weekends and holidays), primary day demand would be 73,191 in the year 2028, and capacity would be 819,840 days. Capacity is predicted to exceed demand for the foreseeable future in Alternative 1.

Alternative 2

Alternative 2 would have the capacity to provide approximately 89,632 primary visitor days (weekends and holidays) and 290,088 total visitor days for OHV recreation (Table 3-28). According to National Visitor Use Monitoring statistics for OHV participation, there are currently about 37,546 recreation visits involving OHV use in the Forest (English, Kocis and Hales 2004). As in Alternative 1, this alternative would also provide excess capacity when compared simply to current demand.

If local growth in participant days continues to grow at the average national rate of 56.1% per decade (Cordell, Betz et al 2008), total estimated demand would be 58,609 days in 2018 and 91,489 days in 2028. Assuming 80% of OHV use is on primary days (weekends and holidays), primary day demand would be 73,191 in the year 2028, and capacity would be 89,632 days. Capacity is predicted to exceed demand for at least the next two decades in Alternative 2.

If Alternative 2 were implemented, many factors that influence demand would change, making a prediction about future demand difficult to quantify. Several features of this alternative may make the Mt. Hood National Forest less desirable for OHV recreation, and demand may go down:

- The total number of route miles in the Forest would be reduced from about 2,300 presently to 221.
- These routes are not all connected; rather they are in six discrete locations.
- Even though most OHV use in the Forest currently takes place in the six OHV systems where routes are proposed in this Alternative, the proposed routes could be more crowded especially on primary days (weekends and holidays). For instance, if the Peavine routes were at full capacity, there would only be an average distance of 333 feet between riders, based on the PAOT calculation shown in Table 3-28.
- Bear Creek, Gibson Prairie, LaDee Flats, and Peavine route systems would provide only moderately adequate day-long recreation opportunities (Table 3-12).
- Class II vehicle enthusiasts would find only modest driving opportunities.
- The opportunities to drive cross-country (off roads and trails) and to camp in the vicinity of Gate Creek Ditch (Rock Creek routes) would be eliminated.

Conversely, other features in Alternative 2 may increase demand:

- The total number of designated OHV trail miles would increase from about 58 presently to roughly 148, including more single-track opportunities.
- The McCubbins Gulch and Rock Creek proposed route systems would each provide fully adequate day-long recreation opportunities (Table 3-12) with distances comparable with many other OHV areas in Oregon (such as Huckleberry Flat, Blue Mountain, Upper Walla Walla).
- A higher level of trail difficulty would offer a greater degree of challenge when compared to the existing situation.
- More developed staging areas, signing and management of proposed routes would provide an overall better recreation experience.

Table 3-28. Estimated available OHV visitor days (by proposed system) for Alternative 2 based on available season, staging area parking capacity (number of vehicles towing a trailer), and persons-at-one-time (PAOTs). Available season is based on seasonal restrictions for soil and wildlife. Number of recreation days includes primary (P = weekends and holidays) and secondary (S = weekdays except for holidays). PAOTs were assumed to be four people per parked vehicle (four motorcycles per trailer) except for Gibson were it was assumed two people per parked vehicle (2 quads per trailer).

Proposed OHV System	Available Season	Number of Rec. Days		Staging Area Parking Capacity	PAOT	Available Visitor Days		Total P + S Visitor Days
		P	S			P	S	
Bear Creek	6/16-10/31	42	96	20	80	3,360	7,680	11,040
Gibson Prairie	6/16-10/31	42	96	18	36	1,512	3,456	4,968
LaDee Flats	4/1-12/1*	76	168	30	120	9,120	20,160	29,280
McCubbins	5/1-11/30*	67	147	20	80	5,360	11,760	17,120
Peavine	6/16-11/30	53	115	150	600	31,800	69,000	100,800
Rock Creek	3/2-10/31	74	170	130	520	38,480	88,400	126,880
Total		**354**	**792**	**368**	**1,436**	**89,632**	**200,456**	**290,088**

*Note: McCubbins Gulch available season based on estimated snow-free season.

Alternative 3

Alternative 3 would provide approximately 120,236 primary visitor days (weekends and holidays) and 388,744 total visitor days for OHV recreation (Table 3-29). According to National Visitor Use Monitoring statistics for OHV participation, there are currently about 37,546 recreation visits involving OHV use in the Forest (English, Kocis and Hales 2004). Alternative 3 would provide considerably more excess capacity than Alternative 2 when compared simply to current demand.

If local growth in participant days continues to grow at the average national rate of 56.1% per decade (Cordell, Betz et al 2008), total estimated demand would be 58,609 days in 2018 and 91,489 days in 2028. Assuming 80% of OHV use is on primary days (weekends and holidays), primary day demand would be 73,191 in the year 2028, and capacity would be 120,236 days. Capacity is predicted to far exceed demand for at least the next two decades in Alternative 3.

Like Alternative 2, implementation of Alternative 3 would introduce new variables making a prediction about future demand difficult to quantify. Several features of this alternative may make the Mt. Hood National Forest less desirable for OHV recreation, and demand may go down:

- The total number of route miles in the Forest would be reduced from about 2,300 presently to 326.
- These routes are not all connected; rather they are in eight discrete locations.

- Even though most OHV use in the Forest currently takes place in the proposed systems where routes are proposed in this Alternative, the proposed routes could end up being more crowded, especially on primary days (weekends and holidays). For instance, if the Rock Creek routes were at full capacity, there would only be an average distance of 621 feet between riders, based on the PAOT calculation shown in Table 3-29.
- With 39.6 miles of single-track trail, the proposed Bear Creek route system would provide only a moderately adequate day-long recreation opportunity (Table 3-13).
- Class II vehicle enthusiasts would find even fewer driving opportunities than in Alternative 2.
- The opportunities to drive cross-country (off roads and trails) and to camp in the vicinity of Gate Creek Ditch (Rock Creek routes) would be eliminated.

Conversely, other features of Alternative 3 may increase demand:

- The total number of designated OHV trail miles would increase from about 58 presently to roughly 200, including even more single-track opportunities than in Alternative 2.
- LaDee Flats (Class I vehicles), McCubbins Gulch (Class III vehicles), Peavine (Class I vehicles) and Rock Creek (Class I and III vehicles) proposed route systems would each provide fully adequate day-long recreation opportunities (Table 3-13) with distances comparable with many other OHV areas in Oregon (such as Huckleberry Flat, Blue Mountain, and Upper Walla Walla).
- Connectivity to Hood River County trails from Gibson Prairie and Mt. Defiance routes would provide a higher quality OHV experience in both jurisdictions.
- A higher level of trail difficulty would offer a greater degree of challenge when compared to the existing situation.
- More developed staging areas, signing and management of proposed routes would provide an overall better recreation experience.
- The opportunity to camp at managed staging areas may be an attraction for those looking for extended trips.

Table 3-29. Estimated available OHV visitor days (by proposed system) for Alternative 3 based on available season, staging area parking capacity (number of vehicles towing a trailer), and persons-at-one-time (PAOTs). Available season is based on seasonal restrictions for soil and wildlife. Number of recreation days includes primary (P = weekends and holidays) and secondary (S = weekdays except for holidays). PAOTs were assumed to be four people per parked vehicle (four motorcycles per trailer) except for Gibson were it was assumed two people per parked vehicle (2 quads per trailer). No capacity or available visitor day estimates were calculated for the Gibson or Mt. Defiance route systems because they would not have staging areas in the Forest. They would essentially be extensions of Hood River County trail systems.

Proposed OHV System	Available Season	Number of Rec. Days		Staging Area Parking Capacity	PAOT	Available Visitor Days		Total P + S Visitor Days
		P	S			P	S	
Bear Creek	6/16-10/31	42	96	20	80	3,360	7,680	11,040
Graham Pass	6/1-10/31*	47	106	43	172	8,084	18,232	26,272
LaDee Flats	4/1-12/1*	76	168	94	376	28,576	63,168	91,744
McCubbins	5/1-11/30*	67	147	79	316	21,172	46,452	67,624
Peavine	6/16-11/30	53	115	97	388	20,564	44,620	65,184
Rock Creek	3/2-10/31	74	170	130	520	38,480	88,400	126,880
Total		**359**	**802**	**463**	**1,852**	**120,236**	**268,552**	**388,744**

*Note: Graham Pass, LaDee and McCubbins available seasons based on estimated snow-free period.

Alternative 4

Alternative 4 would provide approximately 52,960 primary visitor days (weekends and holidays) and 173,280 total visitor days for OHV recreation (Table 3-30). According to National Visitor Use Monitoring statistics for OHV participation, there are currently about 37,546 recreation visits involving OHV use in the Forest (English, Kocis and Hales 2004). Like all of the other alternatives, Alternative 4 would provide excess capacity in the short term when compared simply to current demand.

If local growth in participant days continues to grow at the national average rate of 56.1% per decade (Cordell, Betz et al. 2008), total estimated demand would be 58,609 days in 2018 and 91,489 days in 2028. Assuming 80% of OHV use is on primary days (weekends and holidays), primary day demand would be 46,887 in the year 2018, and capacity would be 52,960 days. In 2028, however, primary day demand would be 73,191, and capacity would still only be 52,960 days. Capacity is predicted to exceed demand for at least the next decade in Alternative 2. It is predicted to fall short sometime during the second decade.

Alternative 4 would also introduce variables making a prediction about future demand difficult to quantify. Several features of this alternative may make the Mt. Hood National Forest less attractive for OHV recreation, and demand may go down:

- The total number of route miles in the Forest would be reduced from about 2,439 presently to 96.
- These routes are not all connected; rather they are in three discrete locations.
- Even though much OHV use in the Forest currently takes place in the three proposed system where routes are proposed in this Alternative, the proposed routes could be more crowded especially on primary days (weekends and holidays).
- LaDee Flats, McCubbins and Rock Creek route systems would provide only moderately adequate day-long recreation opportunities (Table 3-14). No system would provide a fully adequate daylong experience.
- Class II vehicle enthusiasts would find the fewest driving opportunities, especially since Road 4610 (Abbot Road) is not included in Alternative 4.
- The opportunities to drive cross-country (off roads and trails), to ride trails at night, and to camp overnight at OHV staging areas (except McCubbins Gulch Campground) would be eliminated.

Conversely, other features of Alternative 4 may increase demand:

- The total number of designated OHV trail miles would increase from about 58 presently to roughly 70.
- A higher level of trail difficulty would offer a greater degree of challenge when compared to the existing situation.
- More developed staging areas, signing and management of proposed routes would provide an overall better recreation experience.

Table 3-30. Estimated available OHV visitor days (by proposed system) for Alternative 4 based on available season, staging area parking capacity (number of vehicles towing a trailer), and persons-at-one-time (PAOTs). Available season is based on seasonal restrictions for soil and wildlife. Number of recreation days includes primary (P = weekends and holidays) and secondary (S = weekdays except for holidays). PAOTs were assumed to be four people per parked vehicle (four motorcycles per trailer) except for Gibson were it was assumed two people per parked vehicle (2 quads per trailer).

Proposed OHV System	Available Season	Number of Rec. Days		Staging Area Parking Capacity	PAOT	Available Visitor Days		Total P + S Visitor Days
		P	S			P	S	
LaDee Flats	4/1-12/1*	76	168	30	120	9,120	20,160	29,280
McCubbins	5/1-11/30*	67	147	20	80	5,360	11,760	17,120
Rock Creek	3/2-10/31	74	170	130	520	38,480	88,400	126,880
Total		**217**	**485**	**180**	**720**	**52,960**	**120,320**	**173,280**

*Note: LaDee and McCubbins available season based on estimated snow-free season.

Cumulative Effects – Supply and Demand

On the supply side, other National Forests in Oregon are analyzing designated OHV routes in accordance with the Final Travel Management Rule. Decisions have not yet been made, so it is not known if the overall supply of OHV routes would increase or decrease.

The 2008 Road Decommissioning for Aquatic Restoration project and the 2008 Clackamas Road Decommissioning for Aquatic Restoration proposed to decommission roads that are no longer be needed for the administration of the National Forest These decisions reduce the number of miles of roads available for OHV use in Alternative 1.

In Alternatives 1 and 3, the Forest's proposed OHV routes would connect with roads and trails open to Class I and Class III vehicles on lands administered by Hood River County north of Gibson Prairie and also east of Mt. Defiance. The County's Mt. Defiance route system includes 89 miles of roads and 64 miles of trails open to OHVs that would connect to National Forest system routes. In the area north of Gibson routes, there are 79 miles of roads and 63 miles of trails (across three ownerships: SDS, Longview Timber, Hood River County) open to OHV use that would connect to National Forest System routes.

High gasoline prices, negative consumer confidence, and tight credit markets may reduce demand for OHV recreation, at least in the short-term. Fuel prices hurt OHV recreation in 2008 (Albright 2008). In the face of chronic gas price escalation, OHV enthusiasts are predicted to recreate closer to home rather than abandon the sport altogether. For Portland, Vancouver and Willamette Valley residents, the Mt. Hood National Forest is substantially closer to home than central or eastern Oregon. Fewer than half of OHV survey respondents in 2005 said that "lack of money" was an important reason for not participating in their motorized activities more than they do (Bergerson et al. 2005). Given the extent and severity of the current recession, a survey done today would likely reveal a higher percentage affected by financial concerns.

Access to Rock Creek OHV Routes

The following is an analysis of Key Issue 2 (Section 1.10.1) – Designating new OHV routes may alter the balance between motorized and non-motorized recreation interests and uses. For example, some residents of the Sportsman's Park subdivision raised specific concern about restricting direct OHV access to the Rock Creek proposed system, while other residents of the community expressed their desire for direct OHV access.

The following analysis is also based on concerns that the only proposed staging area for the Rock Creek routes may be too high in elevation to provide parking for early season riding.

Measure and Analysis Methodology

Even before the Proposed Action for Rock Creek OHV roads and trails was formally announced for public scoping, tension developed between local property owners opposed to OHV use in the general area and their neighbors who own and enjoy OHVs. Some residents insisted that there be no designated routes closer than four or five miles from the western boundary of Sportsman's Park subdivision. Other residents wanted continued access to traditional routes adjacent to Gate Creek Ditch, but also wanted to be able to continue riding directly from Sportsman's Park to Forest OHV routes.

The interests of some residents seem to be (1) security and (2) quality of life. Perhaps first and foremost, they said that they were concerned about a wildfire erupting from some activity related to OHV recreation. They fear that a wildfire could easily overtake their community and destroy private property or worse. They also expressed concerns about the Forest Service "inviting" too many strangers so close to their homes. Theft and vandalism were among their concerns. Finally, the potential noise and dust from OHV use raises quality of life issues for property owners who moved to Sportsman's Park to get away from such pollution.

The interests of other residents seem to be (1) fairness and (2) convenience. They fear losing one of the primary benefits that motivated some of them to move to Sportsman's Park: easy access to National Forest roads and trails for OHV use. In at least one case, riding OHVs from private property at Sportsman's Park into the Forest provides a unique, life-enriching experience for a family with special needs. OHV owners also feel it would be an unwarranted inconvenience for them to have to trailer their OHVs to a distant staging area and then be able to ride on routes adjacent to their property. Further complicating the matter, in their view, the staging area might be too high in elevation to permit early-season riding.

The alternatives were qualitatively evaluated according to how they meet the interests of local property owners. The distance separating the nearest proposed OHV route from Sportsman's Park is also quantified.

Direct and Indirect Effects – Access to Rock Creek OHV Routes

Alternative 1

In Alternative 1, all routes in the vicinity of Sportsman's Park and other private parcels near Rock Creek Reservoir would continue to be used by OHVs. The closest native surface road that could be used by OHVs (Road 4820-132) is less than 500 feet from the northern boundary of the residential area. In addition, OHVs would not be prohibited from driving off of roads throughout the general area. The terrain is fairly flat, and the vegetation type (ponderosa pine forest with a relatively open shrub understory) is conducive to driving off-road. Prescribed fires and thinning operations in the past several years have further reduced the vegetative understory density. The area west of Rock Creek Reservoir would likely continue to be a popular OHV riding destination. OHV use in the general area is predicted to increase in Alternative 1.

Because of its popularity among OHV enthusiasts, the area around Gate Creek Ditch (approximately 1/4 mile south of Sportsman's Park) is also heavily used for dispersed camping, particularly on weekends during the spring, summer and fall. In Alternative 1, this area would continue to be available for dispersed camping.

Property owners at Sportsman's Park that own OHVs would continue to be able to ride directly into the Forest from private property.

Alternative 2

Alternative 2 would permit OHV use on lower elevation (2,300 feet to 3,200 feet elevation) routes near Sportsman's Park, but would not provide direct access from private property to these routes. OHV owners at Sportsman's Park would need to transport their machines to the staging area at Post Point (elevation 3,600 feet), five miles west of the residential area. The closest designated route to Sportsman's Park would be roughly 0.7 miles from the subdivision's southern boundary.

Driving off-road (an attraction that helped popularize the general Rock Creek area among OHV enthusiasts) would no longer be allowed. This prohibition would put an end to OHV use in the wide-open area adjacent to Gate Creek Ditch, in several quarry areas west of Road 48, and south of Road 48 in the vicinity of an area under permit to the American Native Peoples Organization (ANPO). Also, the route across Gate Creek Ditch on Road 4800-130 would be bridged and armored to protect the structural integrity of the ditch.

Although OHV use would be permitted closer to Sportsman's Park than some residents would prefer, the designated day-use area in Alternative 2 would address some of the security and quality of life issues. There would be a prohibition on campfires and overnight occupancy within a 3,533 acre area surrounding Sportsman's Park, including Gate Creek Ditch. The restrictions on campfires, overnight use and cross-country travel would reduce noise, dust and risk of wildfire threatening private property. The area that would be restricted to "day-use only" represents less than one percent of the Mt. Hood National Forest, so the effect on overall dispersed camping would be very small.

If Alternative 2 were implemented, OHV use of the proposed system is predicted to decline slightly in the short term and grow less rapidly than either Alternative 1 or Alternative 3 in the long term because:

- Alternative 2 would offer fewer designated route miles than currently exist (39.3 miles of designated roads and trails in Alternative 2);
- No off-road riding would be permitted;
- No direct access from Sportsman's Park would be provided; and,
- No overnight use around Gate Creek Ditch would be permitted.

Alternative 3

Alternative 3 would not permit OHV use on most of the lower elevation routes near Sportsman's Park that would be designated in Alternative 2. The majority of designated routes would be more than four miles west of the residential area, and the closest loop route would be about 1.5 miles south. All loop routes are more than two miles west and south of private parcels other than Sportsman's Park.

Alternative 3 would provide direct access from Sportsman's Park to designated OHV routes. OHV owners would be permitted to enter the route system from one proposed trail constructed to the western boundary of the residential area. This is the only route within the Wildland-Urban Interface (WUI). Three design features in this alternative should discourage heavy use on this access route. First, the route is not a loop, but rather a one-way-in/one-way-out route to the residential area. Second, there are more route miles in Alternative 3 than in Alternative 2, and they are centered several miles west of private land. Third, the road to Badger Lake would be designated as an OHV route, providing a desirable destination in the opposite direction from private land.

As in Alternative 2, driving off-road (an attraction that helped popularize the general Rock Creek area among OHV enthusiasts) would no longer be allowed. This prohibition would put an end to OHV use in the wide-open area adjacent to Gate Creek Ditch, in several quarry areas west of Road 48, and south of Road 48, in the vicinity of an area under permit to the American Native Peoples Organization (ANPO). Also as in Alternative 2, there would be a prohibition on campfires and overnight occupancy within a 3,533 acre area surrounding Sportsman's Park, including Gate Creek Ditch. These changes would contribute to a reduction of noise, dust and risk of wildfire threatening private property. The area that would be restricted to "day-use only" represents less than one percent of the Forest, so the effect on overall dispersed camping would be very small.

With one-third more designated route miles (61.2 miles in Alternative 3; 39.3 miles in Alternative 2), and with direct access from Sportsman's Park, Rock Creek routes would likely be more popular in Alternative 3 than in Alternative 2. However, with no off-road riding, and no overnight use permitted around Gate Creek Ditch, OHV use of the proposed system is predicted to remain level in the short term and grow less rapidly than in Alternative 1.

Alternative 4

Alternative 4 would not designate any OHV routes in the lower elevation area (2,300 feet to 3,200 feet elevation). All proposed routes would be more than three miles west of all private parcels in the general Rock Creek area.

Alternative 4 would not provide direct access from Sportsman's Park to designated OHV routes. OHV owners at Sportsman's Park would need to transport their machines to the staging area at Post Point (elevation 3,600 feet), five miles west of the residential area.

As in Alternatives 2 and 3, driving off-road, an attraction that helped popularize the Rock Creek proposed system among OHV enthusiasts, would no longer be allowed. This prohibition would put an end to OHV use in the wide-open area adjacent to Gate Creek Ditch, in several quarry areas west of Road 48, and south of Road 48, in the vicinity of an area under permit to the American Native Peoples Organization (ANPO). However, because no OHV routes would be designated in the vicinity of Sportsman's Park and Gate Creek Ditch, there would be **no** prohibition on campfires or overnight occupancy in the area. Some overnight use would be expected to continue, but it would not be as convenient for OHV groups to camp there.

With roughly the same number of designated route miles (37.2 miles in Alternative 4; 39.6 miles in Alternative 2), but with no direct access from Sportsman's Park, no permitted use of lower elevation routes (more likely to be snow-free in the spring) and no night riding allowed, Rock Creek routes would likely be less popular in Alternative 4 than in either Alternative 2 or Alternative 3. If Alternative 4 were implemented, OHV use of the proposed system is predicted to decline in the short term and grow less rapidly than any of the other alternatives.

Cumulative Effects – Access to Rock Creek OHV Routes

In Alternative 1, cross-country use of OHVs would probably increase because the Sportsman's Park and Ramsey under-burns have reduced understory vegetation providing easier access.

There are no cumulative effects related to this issue for Alternatives 2, 3, and 4.

Noise from OHVs

The following is an analysis of Key Issue 2 (Section 1.10.1) – Changes to OHV designation on the Forest can affect the quality of non-motorized recreation. A specific concern was that the noise of OHVs may adversely affect quiet recreation use, particularly where it carries into roadless and wilderness areas.

Measure and Analysis Methodology

The sound of OHVs in a wildland setting causes displeasure for many who visit the Forest seeking a "quiet" recreation experience. For some, the sound of motorized vehicles is an irreconcilable factor that makes sharing the same space with OHVs unacceptable. This attitude is most acutely felt by "quiet" recreators on trails constructed and maintained for non-motorized use, in developed recreation sites, and in wilderness areas. Notwithstanding the concerns about noise conflicts raised during scoping for this project, the Mt. Hood National Forest receives few complaints about OHV noise.

The Oregon Environmental Quality Commission has the authority to adopt standards for noise emissions from mufflers that are required for off-road vehicles for compliance with ORS 821.040. Currently, Class I, II and III ATVs must be muffled to produce no more than 99 decibels (dB) sound pressure (stationary test at 20 inches). Sound pressure radiating from a point source decreases by a factor of 1/2 as the distance is doubled (Sengpielaudio 2008). Using this principle, it is possible to estimate the damping of sound levels (dB) with distance. To compare the alternatives, an inventory of non-motorized trails, developed recreation sites, and wilderness areas was developed and evaluated for distance from proposed OHV roads, trails and one area. Assuming a point source emitting sound pressure of 99 dB (the highest level allowed by State law), the area within which sound might be readily detected was estimated. A decibel level of 30, commonly characterized as "very quiet," was used as the lower limit of detection. A 99 dB sound pressure measured at 20 inches from an OHV muffler would dampen to 30 dB at about 4,700 feet (0.89 miles) from the source. A comparison of the alternatives was made using the number of miles of non-motorized trail and other areas where sound emitted by OHVs might be readily detected (30 dB or greater). Topographic relief dampens sound pressure; and this effect was considered in determining the affected distance along non-motorized trails or into wilderness areas. Distances were estimated with a map measure. Areas were estimated with a dot grid.

This analysis describes the area where OHV sounds might possibly be heard. No attempt was made to estimate the probability of hearing the sounds. First, there is insufficient in situ data about OHV use and about quiet recreation use (location, duration and timing) to draw any meaningful conclusions. Secondly, the 30+ dB sound detection area (with a radius of 4,700 feet) used in this analysis describes a much larger area than would be created by most OHVs which emit sound at much lower decibels than 99 dB.

Direct and Indirect Effects – Noise from OHVs

Alternative 1

The potential effect of OHV noise in Alternative 1 would be the highest among the four alternatives. In Alternative 1, OHVs would be permitted to use 2,463 miles of National Forest System roads, many of which intersect or are near non-motorized trails. There are 271 managed, non-motorized trails in the Forest (excluding winter-only trails). These trails total approximately 940 miles in length. The cumulative length of non-motorized trails where users would be potentially affected by noise from OHVs is estimated to be 100 miles (estimated with map measure and topographic maps). This number of miles represents 11% of all non-motorized trails in the Forest. Users of even more non-motorized trails could be affected by noise from OHVs traveling off-road.

Users of an estimated 60 miles of wilderness trails would be potentially affected by noise from OHVs (estimated with map measure and topographic maps). This number represents 13% of the 468 miles of wilderness trails in the Forest.

No estimate was made of the number of wilderness acres potentially affected by OHV noise.

Alternative 2

The potential effect of OHV noise in Alternative 2 would be less than Alternative 1 or Alternative 3 and greater than Alternative 4. The number of non-motorized trails where users would potentially be affected by OHV noise would be 11 with a combined affected length of 15.4 miles. There are a total of 940 miles of non-motorized trails managed by the Forest, so OHV sound would potentially affect 2% of all non-motorized trail miles. Four of the potentially affected trails (3.8 miles) are in the Salmon-Huckleberry and Roaring River Wildernesses. There are 468 miles of wilderness trails managed by the Forest, so OHV sound would potentially affect users on less than 1% of all wilderness trail miles (Table 3-31).

The average (mean) shortest distance between a proposed OHV road, trail, and one area and a non-motorized trail would be 1,159 feet. The median shortest distance would be 634 feet. At these distances, the mean and median sound levels would be 41 and 47 dB, respectively, an effect that is characterized as "quiet" (OMSI 2005). Users of the Pacific Crest National Scenic Trail (PCT) would potentially be affected by OHV noises greater than 30 dB for approximately 0.7 miles from sources along roads in the proposed Peavine system. The length of the PCT affected would be greater except for the sound damping effect of North and South Pinhead Buttes. Hikers on Vista Ridge Trail (Trail 626) would not be affected by noise from proposed Bear Creek system roads and trails because of favorable topography. The greatest potential OHV noise effect would be on Trails 783 and 788 which both terminate at a proposed motorized mixed-use road (Table 3-31).

OHV noise from Road 4610 in Alternative 2 could potentially penetrate 4,450 acres in the Salmon-Huckleberry Wilderness, and 5,900 acres of the Roaring River Wilderness. OHV noise from proposed OHV roads and trails could also potentially affect 400 acres of the Lower White River Wilderness and 90 acres of the Clackamas River Wilderness (Sisi Butte). For all practical purposes, human access to most of these acres is limited, and the highest probable effect would be along Trails 507 (Corral Springs), 521 (Huxley Ridge), 783 (Plaza Trail) and 788 (Plaza Lake Trail) for a combined distance of 3.8 miles (Table 3-31).

Four small, developed campgrounds (Clear Creek, Keeps Mill, Summit Lake, and Rock Creek) would be within the 30 dB sound detection area of proposed OHV roads and trails. Campers would potentially experience OHV noise levels at 35 dB or less, an effect characterized as "quiet" (OMSI 2005). Sound from OHVs might be least acceptable to campers during night hours. Night riding would be permitted in Alternative 2 (Table 3-31).

Sportsman's Park is not a National Forest recreation site; however it is addressed here because of the level of concern about OHV noise raised by some residents. In this alternative, the closest proposed OHV road or trail in the Rock Creek system would be 3,276 feet away from the southern boundary of the residential area. The potential OHV noise effect at this distance would be roughly 33 dB, a level characterized as "very quiet" (OMSI 2005).

Table 3-31. Sound pressure (dB) estimates, noise effect and amount of area potentially affected (non-motorized trails, developed recreation sites and wilderness areas) by OHVs on proposed routes by proposed system for Alternative 2. Noise effect symbols: VQ = very quiet; Q = quiet; A = annoying; SHD8 = serious hearing damage (8 hour exposure). Alignment symbols: parallel (=); perpendicular (^); area (O). *Note: For a non-motorized trail perpendicular to a proposed OHV route, the highest sound pressure (column 4) would be only at the closest point (column 3); the sound would diminish to 20 dB over the distance indicated in column 7. C = campground; W = wilderness; A3 = research natural area; A4 = special interest area; A5 = unroaded recreation.

Proposed OHV System	Name of Non-Motorized Trail, Site or Area	Shortest Distance Between Motor and Non-Motor Trails (ft)	Motor Sound Level at Shortest Distance Point (dB)*	Noise Effect	Alignment of Non-Motor Trail or Area to Motor Route*	Length or Area Where Motor Sound May Be Detected
Bear Creek	Trail 632	158 ft.	59	A/Q	=	0.6 Mi.
Gibson Prairie	Trail 688	211 ft.	57	A/Q	=	3.6 Mi.
	Mill Creek A3	0 ft.	99	SHD8	O	487 Ac.
LaDee Flats	Trail 507 (W)	917 ft.	44	Q	^	1.1 Mi.
	Trail 521	917 ft.	44	Q	^	0.3 Mi.
	Trail 521 (W)	2,321 ft.	36	Q/VQ	^	0.7 Mi.
	Trail 783 (W)	0 ft.	99	SHD8	^	1.1 Mi.
	Trail 788 (W)	0 ft.	99	SHD8	^	0.9 Mi.
	Salmon-Huck. W	0 ft.	99	SHD8	O	4,450 Ac.
	Roaring River W	0 ft.	99	SHD8	O	5,900 Ac.
	Squaw Mdws. A4	0 ft.	99	SHD8	O	774 Ac.
McCubbins Gulch	Trail 487	3,310 ft.	33	VQ	^	0.2 Mi.
	Trail 490	211 ft.	57	Q	^	0.7 Mi.
	Trail 490A	634 ft.	47	Q	=	2.9 Mi.
	Clear Creek (C)	2,690 ft.	35	VQ	O	< 10 Ac.
	Keeps Mill (C)	3,749 ft.	32	VQ	O	< 10 Ac.
	L. White R. W	0 ft.	99	SHD8	O	400 Ac.
Peavine	Trail 2000	3,696 ft.	32	VQ	=	0.7 Mi.
	Summit Lake CG	4,224 ft.	31	VQ	O	< 10 Ac.
	Clackamas W	2,640 ft.	35	VQ	O	90 Ac.
Rock Creek	Trail 478	2,694 ft.	35	VQ	=	2.6 Mi.
	Rock Creek CG	3,379 ft.	33	VQ	O	< 10 Ac.
	Grasshopper A5	0	99	SHD8	O	840 Ac.
	Sportsman's Park	3,379 ft.	33	VQ	O	70 Ac.

Alternative 3

The potential effect of OHV noise in this alternative would be less than Alternative 1 and greater than Alternatives 2 and 4. The number of non-motorized trails where users would be potentially affected by OHV noise would be 24 with a combined affected length of 28.4 miles. There are a total of 940 miles of non-motorized trails managed by the Forest, so OHV sound would potentially affect 3% of all non-motorized trail miles. Eleven of the potentially affected trails (12.5 miles) are in designated wilderness areas. There are 468 miles of wilderness trails managed by the Forest, so OHV sound would potentially affect 3% of all wilderness trail miles (Table 3-32).

The average (mean) shortest distance between a proposed OHV road, trail, and one area and a non-motorized trail would be 1,191 feet. The median shortest distance would be 634 feet. At these distances, the mean and median sound levels would be 42 and 47 dB, respectively, an effect characterized as "quiet" (OMSI 2005). In Alternative 3, the Pacific Crest National Scenic Trail falls outside the 30 dB OHV sound detection area. As in Alternative 2, hikers on the Vista Ridge Trail (Trail 626) would not be affected by noise from proposed Bear Creek system roads and trails because of topographic relief. The greatest potential noise effect on non-motorized trails would be at the intersections of Trails 465, 466, 466A, 479A, 783 and 788 with proposed OHV roads and trails (Table 3-32).

OHV noise along proposed OHV roads and trails in Alternative 3 could potentially affect five designated wilderness areas: 4,450 acres in the Salmon-Huckleberry Wilderness; 5,400 acres in the Roaring River Wilderness; 320 acres in the Mark O. Hatfield Wilderness; 400 acres in the Lower White River Wilderness; and 4,300 acres in the Badger Creek Wilderness. For all practical purposes, human access to most of these acres is limited, and the most likely effect would be along 11 wilderness trails for a combined distance of 12.5 miles (Table 3-32). Four wilderness trails (Trails 465, 466, 783 and 788) intersect a proposed OHV road or trail, locations with the greatest potential sound conflicts (Table 3-32).

OHV noise from the proposed Mt. Defiance system would not affect users of trails or areas in the Columbia River Gorge National Scenic Area because of favorable topography.

The same four small, developed campgrounds as in Alternative 2 (Clear Creek, Keeps Mill, Summit Lake, and Rock Creek) would be within the 30 dB sound detection area of proposed OHV roads and trails in Alternative 3 (Table 3-32). Compared to Alternative 2, Clear Creek Campground would be slightly closer to proposed OHV roads and trails in the McCubbins system, and Rock Creek Campground would be slightly farther away from proposed OHV roads and trails in the Rock Creek system. Campers would potentially experience OHV noise levels at 37 dB or less, an effect characterized as "quiet" (OMSI 2005). Sound from OHVs might be least acceptable to campers during night hours. Night riding would be permitted in Alternative 3.

In Alternative 3, a proposed OHV trail would intersect the boundary of Sportsman's Park residential area allowing direct access for residents to the proposed Rock Creek system. The potential OHV noise effect at the boundary would be 99 dB, a level capable of causing serious health effects if the noise were sustained for eight hours (OMSI 2005). In reality, noises at this point location would be expected to be ephemeral. It is also likely that the sound level would be considerably less than 99 dB. Virtually all use of the access trail to Sportsman's Park would be by homeowners who have a stake in the livability of their community. Also, most of the OHV use on the trail would be Class I ATVs that generally are quieter than motorcycles. There are currently 53 property owners at Sportsman's Park that own a Class I ATV (Bursell, personal communication, 2008).

Table 3-32. Sound pressure (dB) estimates, noise effect and amount of area potentially affected (non-motorized trails, developed recreation sites and wilderness areas) by OHVs on proposed routes by proposed system for Alternative 3. Noise effect symbols: VQ = very quiet; Q = quiet; A = annoying; SHD8 = serious hearing damage (8 hour exposure). Alignment symbols: parallel (=); perpendicular (^); area (O). *Note: For a non-motorized trail perpendicular to a proposed OHV route, the highest sound pressure (column 4) would be only at the closest point (column 3); the sound would diminish to 20 dB over the distance indicated in column 7. C = campground; W = wilderness; A3 = research natural area; A4 = special interest area; A5 = unroaded recreation.

Proposed OHV System	Name of Non-Motorized Trail, Site or Area	Shortest Distance Between Motor and Non-Motor Trails (ft)	Motor Sound Level at Shortest Distance Point (dB)*	Noise Effect	Alignment of Non-Motor Trail or Area to Motor Route*	Length or Area Where Motor Sound May Be Detected
Bear Creek	Trail 632	158 ft.	59	A/Q	=	0.6 Mi.
Gibson Prairie	Trail 688	2,534 ft.	35	VQ	=	1.2 Mi.
Graham Pass	Sugar Pine A4	1,320 ft.	41	Q/VQ	O	35 Ac.
La Dee	Trail 507 (W)	917 ft.	44	Q	^	1.1 Mi.
	Trail 521	917 ft.	44	Q	^	0.3 Mi.
	Trail 521 (W)	2,321 ft.	36	Q/VQ	^	0.7 Mi.
	Trail 783 (W)	0 ft.	99	SHD8	^	1.1 Mi.
	Trail 788 (W)	0 ft.	99	SHD8	^	0.9 Mi.
	Salmon-Huck. W	0 ft.	99	SHD8	O	4,450 Ac.
	Roaring River W	0 ft.	99	SHD8	O	5,400 Ac.
	Squaw Mdws. A4	0 ft.	99	SHD8	O	774 Ac.
McCubbins	Trail 487	2,750 ft.	35	VQ	^	0.7 Mi.
	Trail 490	211 ft.	57	A/Q	^	0.7 Mi.
	Trail 490A	634 ft.	47	Q	=	2.9 Mi.
	Clear Creek CG	2,090 ft.	37	VQ	O	< 10 Ac.
	Keeps Mill CG	3,749 ft.	32	VQ	O	< 10 Ac.
	L. White R. W	0 ft.	99	SHD8	O	400 Ac.
Mt. Defiance	Trail 413 (W)	3,106 ft.	34	VQ	^	0.9 Mi.
	Trail 413B	3,572 ft.	32	VQ	^	0.4 Mi.
	Trail 414	3,339 ft.	33	VQ	^	0.1 Mi.
	Trail 417	158 ft.	59	A/Q	^	1.5 Mi.
	Trail 417 (W)	1,766 ft.	39	VQ	^	0.7 Mi.
	Trail 417A	158 ft.	59	A/Q	^	0.1 Mi.
	Trail 610	528 ft.	49	Q	^	0.9 Mi.
	Mark Hatfield W	0 ft.	99	SHD8	O	320 Ac.
Peavine	Summit Lake CG	4,224 ft.	31	VQ	O	<10 Ac.
Rock Creek	Trail 458 (W)	1,109 ft.	43	Q/VQ	=	1.4 Mi.
	Trail 463	4,265 ft.	31	VQ	^	0.3 Mi.
	Trail 464	2,918 ft.	34	VQ	^	0.4 Mi.
	Trail 465 (W)	0 ft.	99	SHD8	^	0.9 Mi.
	Trail 466 (W)	0 ft.	99	SHD8	^	1.2 Mi.
	Trail 466A	0 ft.	99	SHD8	^	0.9 Mi.
	Trail 478	634 ft.	47	Q	=	4.9 Mi.
	Trail 479 (W)	684 ft.	47	Q	=	2.9 Mi.
	Trail 479A	0 ft.	99	SHD8	^	0.2 Mi.
	Trail 479A (W)	673	47	Q	^	0.7 Mi.
	Rock Creek CG	3,592 ft.	32	VQ	O	< 10 Ac.
	Sportsman's Park	0 ft.	99	SHD8	O	70 Ac.
	Badger Creek W	0 ft.	99	SHD8	O	4,300 Ac.
	Grasshopper A5	0 ft.	99	SHD8	O	1,260 Ac.

Alternative 4

Alternative 4 would have the least potential effect from OHV noise (Table 3-33). The number of non-motorized trails where users would be potentially affected by OHV noise would be four, with a combined affected length of 6.6 miles. There are a total of 940 miles of non-motorized trails managed by the Forest, so OHV sound would potentially affect less than 1% of all non-motorized trails miles. No potentially affected trail is in a designated wilderness area.

Table 3-33. Sound pressure (dB) estimates, noise effect and amount of area potentially affected (non-motorized trails, developed recreation sites and wilderness areas) by OHVs on proposed routes by proposed system for Alternative 4. Noise effect symbols: VQ = very quiet; Q = quiet; A = annoying; SHD8 = serious hearing damage (8 hour exposure). Alignment symbols: parallel (=); perpendicular (^); area (O). *Note: For a non-motorized trail perpendicular to a proposed OHV route, the highest sound pressure (column 4) would be only at the closest point (column 3); the sound would diminish to 20 dB over the distance indicated in column 7. C = campground; W = wilderness; A3 = research natural area; A4 = special interest area; A5 = unroaded recreation.

Proposed OHV System	Name of Non-Motorized Trail , Site or Area	Shortest Distance Between Motor and Non-Motor Trails	Motor Sound at Shortest Distance Point (dB)*	Noise Effect	Alignment of Non-Motor Trail or Site to Motor Route*	Length or Area Where Motor Sound May Be Detected
LaDee Flats	None					
McCubbins Gulch	Trail 487	3,310 ft.	33	VQ	^	0.2 Mi.
	Trail 490	211 ft.	57	A/Q	^	0.7 Mi.
	Trail 490A	634 ft.	47	Q	=	2.9 Mi.
	Clear Creek CG	2,690 ft.	35	VQ	O	< 10 Ac.
	Keeps Mill CG	3,749 ft.	32	VQ	O	< 10 Ac.
	L. White R. W	0 ft.	99	SHD8	O	250 Ac.
Rock Creek	Trail 478	634 ft.	47	Q	=	2.8 Mi.
	Grasshopper A5	0 ft.	99	SHD8	O	840 Ac.

None of the trails in Table 3-33 intersect a proposed OHV road or trail. The median shortest distance between a proposed OHV road or trail and a non-motorized trail would be 634 feet. At this distance, the sound level would be 47 dB, an effect characterized as a “quiet” (OMSI 2005). In Alternative 4, the Pacific Crest National Scenic Trail falls outside the 30 dB OHV sound detection area.

OHV noise from proposed OHV roads, trails and one area in Alternative 4 would potentially affect people using 250 acres in the Lower White River Wilderness (Table 3-33). There are no managed trails in this wilderness, so the effect to people would be minimal.

Only Clear Creek and Keeps Mill Campgrounds would be within the 30 dB sound detection areas of proposed OHV roads and trails in Alternative 4 (Table 3-33). The potential effects from OHV noise at both of these campgrounds would be the same as in Alternative 2. Campers would potentially experience OHV noise levels at 35 dB or less, an effect characterized as “quiet” (OMSI 2005).

Sportsman’s Park residential area would not be directly affected by OHV noise from proposed Rock Creek system roads and trails. Some residents may notice noise from their neighbors loading OHVs onto trailers to haul them to designated routes.

Cumulative Effects – Noise from OHVs

Virtually all of the noise effects on non-motorized trails would be related to OHVs on motorized mixed-use roads. Other routine and customary vehicular traffic would continue to use the roads, however most road noise from licensed vehicles would have a sound level less than 70 dB (OMSI 2005). The distance at which this sound level would dampen to 30 dB is about 166 feet, substantially less than the distance for OHV noise. The volume of traffic on all of the proposed motorized mixed-use roads is not known.

3.1.3. Incomplete and Unavailable Information

The Forest has not done a comprehensive inventory of user-created OHV routes resulting from repeated cross-country travel. Early in the development of this project, OHV users were invited to suggest routes (both for Forest Service roads and trails as well as user-created routes) that they wanted to have considered as designated OHV routes. Some of these routes are included in the action alternatives. Knowing the location and condition of other user-created routes would be useful in order to decommission them, however such an inventory was not considered vital for this analysis.

The 2003 National Visitor Use Monitoring study provides a gross, Forestwide estimate of visitor participation in motorized vehicle sports. Statistics are only valid at the Forest level. NVUM does not provide any information about how that participation is distributed in time or space. The study also does not indicate what classes of vehicles were used at the time of the survey. Information about specific location of current OHV use is based on empirical information (field observation and discussions with users).

This analysis reports the potential sound level from OHVs that might be heard on non-motorized trails, at developed recreation sites, and in wilderness areas. It does not evaluate the probability that these sounds would actually be heard by humans or the duration of that sound. The amount of use that the affected non-motorized trails receive is not known, nor is the volume of traffic on all of the proposed motorized routes. Knowing current trail and road use could have provided a way to estimate the probability of noise conflicts. However, for many quiet users of the Forest, any OHV noise (or even knowing that such a noise might be heard) has a negative effect on their recreation experience (Moore 1994). Therefore, it was felt that determining the location of potential noise conflicts was more important than estimating the probability of such conflicts.

The Forest's gravel and native surface road system connects to roads on lands administered by the Bureau of Land Management along the western boundary of the Forest (south of Estacada and north of Opal Creek). The number of connected miles open to OHVs on other ownerships in this vicinity is considerable, but not know precisely. The exact number of miles of connected roads would not affect the conclusions made in this analysis.

3.2. Soils

This analysis is based on the information found in the Soils Specialist Report for this project, which is in the project record located at the Forest Headquarters Office in Sandy, Oregon.

3.2.1. Affected Environment

Soil types used in this analysis were derived from the Mt. Hood National Forest Soil Resource Inventory (Howes 1979). Each proposed OHV system was evaluated individually due to the variety of ecotypes and soils present. This analysis also provides unique and new challenges regarding how to measure and predict impacts using standards that apply primarily to timber management practices in the era of the Forest Plan when it was new. The existing standards still work very well for assessing and predicting impacts to soil productivity in specifically bounded and measurable areas, such as stands undergoing vegetation treatments. However, they are more difficult to use for recently completed analyses, such as grazing and invasive plant treatments where the analysis area is so large that collection of soil samples is not practical, or a standard does not exist to address a specific concern.

For this EIS, the primary concerns are soil erosion risk, proximity to sensitive lands or features (such as meadows), and the ability of the soil to resist impacts and ability to recover from those impacts (resiliency) as a way to evaluate productivity. The scale for the soil erosion analysis were points and trail segments that are of highest risk for erosion, especially the potential for material that could be delivered to watercourses. The scale for productivity impacts (i.e., detrimental soil conditions caused by compaction) on the land have typically been evaluated and monitored at a stand scale of five to 60 acres and works very well, but is a very timber management point of view. Evaluating at an extremely fine scale, such as the trail tread itself, would no doubt show high detrimental impacts and nearly total productivity loss. From the standpoint of site scale and larger, this is not much different than viewing a patch of bare ground a few feet square and calling the area denuded and unproductive, even though it may be surrounded by healthy vegetation. Evaluating at a landscape or even a mid-scale, productivity impacts from OHV trail treads would appear almost invisible, narrow lines across hundreds of acres partially masked where they overlap existing roads. Based on this line of thinking, the focus of the analysis for all proposed OHV routes was based upon two main factors: 1) erosion risk at a very site-specific scale for potential off site impacts to water; and 2) at the OHV system scale for sensitive land risk and soil resistance/resiliency. Both factors are based on the amount of land potentially impacted system by system and by alternative. Comparison of the alternatives was measured relative to one another by OHV system using a set of tables to score proximity to sensitive land and landscape resilience/resistance.

LaDee Flats Proposed OHV System (Soil Types 107, 312, 313, 320)

This analysis area has been impacted by many types of OHV use for several years, especially the flat western side where soil type 107 is mapped (the actual LaDee Flats proper). Soil 107 has a dense clay pan that restricts water infiltration, which causes ponding and high water tables year round. Despite the obvious visible damage, of the eight proposed OHV systems, this one is one of the most resilient to disturbance, and once vehicle traffic is eliminated from sensitive areas they should revegetate quickly. Soils on this flat are not highly erosive due to very level terrain and because the high amount of sticky clay tends to hold particles together.

At present, no defined staging area exists to accommodate the current use, so public parking occurs spontaneously where there are existing wide spots or pullouts. Ditchline mudding is a chronic problem because of the frequent standing water in some ditches due to the high water table, and the water tends to remain muddy for long periods of time because the extremely fine clay particles remain suspended in water. Fortunately, very few active drainageways are present, so dislodged soil particles tend to remain close to their source in small depressions and ditches.

On the eastern half of the area, 300 series soils are present. These particular soil types occur on the sideslopes of landforms that have been glaciated and are much steeper than the westside. No clay pan is present and water infiltration is very fast due to the sandy and rocky nature of these soils.

Peavine Proposed OHV System (Soil Types 304, 305)

This analysis area has one flat native surface road and many gravel roads that are in stable condition. Existing legal use of roads is occurring; and no soil damage was observed. At present, no defined staging area exists to accommodate current incidental use. Soils are derived from volcanic ash that has undergone considerable mixing with glacial deposits, resulting in rocky, sandy soils. The landform is gentle and rolling.

Graham Pass Proposed OHV System (Soil Type 309)

This analysis area is very similar to Peavine with gentle rounded slopes; glaciated, sandy and rocky soils with high infiltration. With the exception of the Rho Ridge Trail, most use would occur on existing gravel roads that are very stable. Some small wet meadows occur near the Rho Ridge Trail in the center of this proposed OHV system. Although Rho Ridge Trail is open to motorized use, it does not appear to be occurring. The northern part of the trail has a substantial needle cast groundcover from the overstory trees there, which is providing excellent protective groundcover. The southern part goes through old logging units and although bare, appears very stable. No motorized wheel tracks of any kind were seen on site visits.

Bear Creek Proposed OHV System (Soil Type 333)

This analysis area is very rocky and water tends to infiltrate readily. No evidence of OHV use was observed although legal use on gravel roads is allowed. At present, no defined staging area exists to accommodate the current incidental use. The soils and landforms are similar to Graham Pass and Peavine.

Mt. Defiance Proposed OHV System (Soil Types 333, 6)

This analysis area contains extremely rocky soils and may be the most resistant to damage of all the proposed OHV systems. This area is similar to Bear Creek, but rockier. Hundreds of acres in this area have had vegetation treatments, primarily commercial thinning, which has provided the opportunity to produce numerous planning and monitoring reports regarding the soils located here. Field reviews have shown repeatedly the rocky and resistant nature of this area. Some OHV use is occurring on the gravel roads in the project area.

Gibson Prairie Proposed OHV System (Soil Type 347)

This analysis area is one of the most sensitive to disturbance and has more meadows and wet areas that may tempt some people. At present, no defined staging area exists to accommodate the current use. Soils have been derived from deep volcanic ash deposits that overlie old glacial deposits. Not as much mixing of the two materials has occurred compared with the previous areas described above. Although this analysis area has good infiltration, the lack of rock content and loamy soil textures make it erosive and susceptible to damage.

McCubbins Gulch Proposed OHV System (Soil Type 352)

This analysis area has been a designated OHV system destination for many years with an established trail system and use pattern. Lack of adequate parking and staging areas has resulted in encroachment into the Forest. Surface soils here are similar to Gibson Prairie, although the underlying bedrock and possible glacial outwash deposits have been mixed together more and contain more sand and rock in the soil profile.

McCubbins Campground and the surrounding area along Clear Creek Irrigation Ditch have been nearly denuded of all vegetation. Evidence of soil movement directly into the irrigation ditch was observed. Vehicle controls such as boulders and logs have been moved by the public so they can drive and park where they want. This area is the most damaged of all the proposed OHV systems in terms of a continuous, bare, compacted situation. Despite the surface soil damage, the large trees in and around the campground appear to be surviving. They are likely tapping in to the ditch water nearby, which may be offsetting some of the stress on their surface roots caused by the soil damage. This area would be difficult to restore, but it is possible to do so using techniques such as mulch addition and shrub planting used with very large boulders to keep vehicle impacts away from the ditch. This area is so heavily used that restoration success is only ultimately possible with cooperation from the people using the area.

Rock Creek Proposed OHV System (Soil Types 152, 156, 352, 353)

The eastside of this OHV system is the least resilient of the eight proposed OHV systems. Once damage occurs it is very difficult to repair. Soils and landform are similar, dryer versions of the McCubbins analysis area, with more open grassland meadows and higher pH 'sweet' soils. Use has been occurring for several years, and numerous user created trails are already established. Lack of adequate parking and staging areas has resulted in encroachment into the Forest. At present, no defined staging area exists to accommodate the current use.

General Forest (Numerous Soil Types)

OHV use is occurring across the Forest in locations outside of the proposed OHV systems, and it is likely there are more trails existing across general forested areas than are documented. Mudding, trails, and/or stream crossings have been observed in Ramsey Creek (new parcel primarily), Larch Creek, White River, Tygh/Jordan Creeks, Fifteenmile Creek, Hood River, Mill Creek, and Clackamas River. This is all user created, and often is not located properly on the landscape to minimize impacts to vegetation, soils and water quality, as well as other resources.

The current level of impact for the general forest area is the most difficult to characterize for two primary reasons. First, the *extent* (geographic location) is not fully known and probably increases from year to year; and second, the actual *level* of impact (heavily vs. slightly) within each geographic area has not been ranked. Despite the lack of hard data, anecdotal information from reliable resource professionals has been known for several years, with the consensus being that use is on an ever increasing upward trend.

3.2.2. Effects Analysis

Indirect and Direct Effects

The indirect and direct effects for each alternative are discussed below. Effects for each alternative are discussed by proposed OHV system. A summary of the effects by alternative is presented at the end of this section. Following this section is a discussion of the cumulative impacts.

Alternative 1 – No Action

LaDee Flats Proposed OHV System

This analysis area has been closed by a Forest Order. However, illegal use is continuing and is hindering revegetation of bare areas. Circumstances described in the existing condition would continue. Damaged soils would remain in detrimental condition, and adjacent relatively undisturbed areas would remain at risk by encroachment of various types of off road vehicles, parking, and continued ditchline mudding. The abundance of water in this area provides an obvious attraction to some riders, and without more, larger, better placed physical controls and barriers they could continue to go off trail as they do now.

Peavine Proposed OHV System

No OHV damage to soils was observed during field visits, and no damage would be expected with this alternative, even with the continuation of use from street legal vehicles on existing gravel roads. No staging area would be constructed.

Graham Pass Proposed OHV System

No OHV damage to soils was observed during field visits, and no damage would be expected with this alternative. No staging area would be constructed. Existing gravel road use would continue.

Bear Creek Proposed OHV System

No trail construction would occur. No OHV damage to soils was observed, and none would be expected with this alternative. No staging area would be constructed. Existing gravel road use would continue, although it appears to be very light and sporadic.

Mt. Defiance Proposed OHV System

With no action, existing gravel road use would continue to occur, causing very minimal impact to soils.

Gibson Prairie Proposed OHV System

This system has been closed by a Forest Order. Nevertheless, illegal use continues. This area is the most sensitive to disturbance and has more meadows and wet areas than other proposed OHV systems. These kinds of natural sensitive features tempt some riders, so it follows that there is the risk of damage to soils. No staging area would be constructed. As with the LaDee Flats OHV system, damaged soils would remain in detrimental condition, and adjacent relatively undisturbed areas would remain at risk by encroachment of various types of off road vehicles.

McCubbins Gulch Proposed OHV System

This system has been an OHV destination for many years with established trail and use patterns. With no action, parts of this area would continue to be detrimentally compacted and denuded. Ultimately, at some point the large trees in the campground would likely begin to outwardly show signs of distress and may have to be removed if they show a decline in health that causes them to become hazardous to the public. Sediment input would continue to be chronic in the adjacent open ditch.

Rock Creek Proposed OHV System

The eastside of this OHV location is the least resilient of the eight proposed OHV systems. Due to the poor resiliency and open access in this area, even light use has caused lingering damage. Once damage occurs it is very difficult to repair. Use has been occurring for several years, and numerous user created trails are already established. Lack of defined parking, staging areas, and traffic controls have resulted in continued encroachment into the Forest. With no action, we can expect to see further encroachment and lingering soil damage.

General Forest

With the no action alternative, locations currently experiencing OHV use would likely continue to be increasingly impacted. New use would continue to initiate in places where topography and vegetation allow. Existing user created trails, as well as those appearing in the future, have and could continue to be located in places prone to high erosion and sedimentation risks.

Alternative 2 – Proposed Action

LaDee Flats Proposed OHV System

This alternative would define specific routes and parking (staging) areas, which would provide the opportunity to recover parts of routes and variously shaped parking areas typically denuded and muddy. This would be an improvement over the existing condition by providing groundcover to reduce erosion risks. The staging area parking proposed in this alternative would occur on an already disturbed timber sale landing. Therefore, no additional impacts are expected.

Peavine Proposed OHV System

Very little impact is expected from this system. Almost all the OHV route surface in this alternative is graveled, which, along with the flat terrain and rocky soils, results in very low erosion potential.

Graham Pass Proposed OHV System

No OHV use is proposed under this alternative. Current legal use would be eliminated; therefore, the risk of having impacts off the road systems would be reduced as discussed under 'General Forest' below.

Bear Creek Proposed OHV System

In this alternative, 39 miles of new motorcycle trail would be built. Planned trails have numerous switchbacks to keep close to the contour, reducing the erosion risk. This analysis area is very rocky and water tends to infiltrate rapidly. The narrowness of the motorcycle trail would reduce the amount of clearing and width as compared with larger OHVs. Nevertheless, this system proposes the highest amount of new construction, as compared to the other action alternatives. As with most new disturbance, the highest risk for erosion is within the first few years. The risk then levels off. This situation is no different, and due to the areas rockiness, the risk after a few years should be quite low.

Mt. Defiance Proposed OHV System

No OHV use is proposed under this alternative. Current legal use would be eliminated; therefore, the risk of having impacts off the road systems would be reduced as discussed under 'General Forest' below.

Gibson Prairie Proposed OHV System

In this alternative, the Gibson Prairie system has the potential to damage more sensitive land than any other system because of the proximity of trails to meadows and wet areas. Types of damage that occurs in such areas include wheel ruts, *de*vegetation, loss of soil structure that reduces infiltration rates, subsequent runoff during heavy rains, and reduced revegetation rates. The staging area proposed in this alternative would occur on an already disturbed and graveled loading/unloading zone used for cattle drop-off and pick-up. Therefore, no additional impacts are expected.

McCubbins Gulch Proposed OHV System

This alternative adds about five more miles to the current trail system, and would not address current problems with forest encroachment explained in the existing condition section. Therefore, additional miles of trial would increase the possibility of further encroachment into the forest. The staging area parking proposed in this alternative would occur on an already disturbed timber sale landing. Therefore, no additional impacts are expected.

Rock Creek Proposed OHV System

The Rock Creek system in this alternative is not much different than what is currently on the ground. The Day Use Area is already impacted and being used frequently; and eliminating overnight camping would not change or reduce existing impacts. As with the McCubbins system, an additional 6 miles of trail construction would increase the possibility of further encroachment.

General Forest

Under this alternative no OHV use would be allowed outside proposed roads and trails, including gravel roads, with the new policy of the Forest being 'closed unless designated open'. Therefore, further impacts to the general forest caused by OHVs would not occur, which is a substantial improvement from the current condition. Existing impacts would be able to mend themselves, with active restoration projects occurring where needed to speed the recovery process.

Alternative 3

LaDee Flats Proposed OHV System

This would be very similar to Alternative 2, but with slightly more mileage due to the conversion of three roads from mixed-use to strictly trail; and the addition of one more staging area on the Abbott Road viewpoint. Although this has the potential to be the most impactful of the action alternatives by simply adding to the system, it also has the potential to be a great improvement over the existing condition by controlling access and keeping riders restricted to defined trail treads. This is especially true with the practice of ditchline mudding. The staging area parking proposed in this alternative would occur on an already disturbed timber sale landing. Therefore, no additional impacts are expected.

Peavine Proposed OHV System

In this alternative, routes south of Road 42 would be dropped and several miles would be added to the west to make a viable system. A total of approximately nine miles of new construction would occur compared to three miles in Alternative 2. In addition, route miles would add up to about 50, versus 38 in Alternative 2. This would cause more impact by virtue of the additional miles than the system in Alternative 2, thus increasing the risk of unintended effects.

Graham Pass Proposed OHV System

Almost all the OHV route surface in this alternative is graveled, which, along with the flat terrain and rocky soils, results in very low erosion potential. The Rho Ridge Trail is the only native surface part, and it is very flat as well. Although very minor, this would pose the greatest risk to erosion from this system. If erosion does occur on the trail, it would be very small and travel a very short distance. A few small, wet meadows are visible along the north end of the trail and may be an unfortunate attraction to some riders.

Bear Creek Proposed OHV System

Effects would be very similar to Alternative 2. The risk of erosion from new trails would be less overall because some existing roads would be used, which would reduce new construction by about six miles.

Mt. Defiance Proposed OHV System

All six miles of the OHV trail surface in this alternative are graveled. In addition, the rocky nature of the area makes it very resistant to erosional forces. Therefore, no additional soil impacts are expected.

Gibson Prairie Proposed OHV System

In this alternative, the amount of trail proposed is much smaller than in Alternative 2, and is also located away from places like Gibson and Long Prairies. Therefore, the risk to sensitive land is less than alternative 2.

McCubbins Gulch Proposed OHV System

Increasing total mileage of the system proposed in this alternative is the most potentially impactive of the action alternatives due to the increased risk of forest encroachment and direct soil impacts from the trail system itself. The staging area parking proposed in this alternative would occur on an already disturbed timber sale landing. Therefore, no additional impacts are expected.

Rock Creek Proposed OHV System

The Rock Creek system in this alternative is not much different than what is currently on the ground. The Day Use Area is already impacted and being used frequently; and eliminating overnight camping would not change or reduce existing impacts. As with the McCubbins system, an additional seven miles of trail construction would increase the amount of current impact, as well as increase the possibility of further encroachment. Adding the 4860 Road is not expected to increase impacts. However, it does increase the possibility of more intense impacts in and around the Badger Lake Campground at the end of the road.

General Forest

Under this alternative no OHV use would be allowed outside proposed roads and trails, including gravel roads, with the new policy of the Forest being 'closed unless designated open'. Therefore, further impacts to the general forest caused by OHVs would not occur, which is a substantial improvement from the current condition. Existing impacts would be able to mend themselves, with active restoration projects occurring where needed to speed the recovery process.

Alternative 4

LaDee Flats Proposed OHV System

The proposed eastside system and additional Abbott Road staging area located on glaciated soil types would be dropped in this alternative. Impacts from the remaining proposed system on LaDee Flats itself would be similar to Alternatives 2 and 3. The staging area parking proposed in this alternative would occur on an already disturbed timber sale landing. Therefore, no additional impacts are expected.

Peavine Proposed OHV System

No OHV use is proposed under this alternative. Current legal use would be eliminated; therefore, the risk of having impacts off the road systems would be reduced as discussed under 'General Forest' below.

Graham Pass Proposed OHV System

No OHV use is proposed under this alternative. Current legal use would be eliminated; therefore, the risk of having impacts off the road systems would be reduced as discussed under 'General Forest' below.

Bear Creek Proposed OHV System

No OHV use is proposed under this alternative. Current legal use would be eliminated; therefore, the risk of having impacts off the road systems would be reduced as discussed under 'General Forest' below.

Mt. Defiance Proposed OHV System

No OHV use is proposed under this alternative. Current legal use would be eliminated; therefore, the risk of having impacts off the road systems would be reduced as discussed under 'General Forest' below.

Gibson Prairie Proposed OHV System

No OHV use is proposed under this alternative. Current legal use would be eliminated; therefore, the risk of having impacts off the road systems would be reduced as discussed under 'General Forest' below.

McCubbins Gulch Proposed OHV System

This is a substantially smaller proposed system than alternatives 2 or 3, with only one mile of new construction. In addition to reduced impacts, this alternative would close some user created trails, providing an opportunity to restore, revegetate, and reduce erosion risk on unauthorized trails. The staging area parking proposed in this alternative would occur on an already disturbed timber sale landing. Therefore, no additional impacts are expected.

Rock Creek Proposed OHV System

The Rock Creek system in this alternative is smaller with less new construction and no Day Use Area proposed. Therefore, it is the least impactive of the action alternatives.

General Forest

Under this alternative no OHV use would be allowed outside proposed roads and trails, including gravel roads, with the new policy of the Forest being 'closed unless designated open'. Therefore, further impacts to the general forest caused by OHVs would not occur, which is a substantial improvement from the current condition. Existing impacts would be able to mend themselves, with active restoration projects occurring where needed to speed the recovery process.

Summary of Alternatives

Of the alternatives, Alternative 4 is the least impacting, followed by alternatives 2, 3, and then 1. Because of the extensive area that has been impacted, along with the likely potential for increasing impacts in so many locations across the entire Forest, Alternative 1 is by far the most potentially damaging to soils across the General Forest of any action alternative. Of all the OHV systems proposed, Rock Creek, due to its proximity to numerous meadows and lack of resiliency to damage, ranks out as the most at risk with regard to possible soil damage in all action alternatives.

Two groups of OHV systems are evident regardless of alternative – set one includes Rock Creek, McCubbins Gulch, Gibson Prairie, LaDee Flat, and Graham Pass. This set of OHV systems is of higher concern than set two, which include Bear Creek, Peavine, and Mt. Defiance. OHV systems from set two occur on soils that are very resistant to forces that result in adverse soil conditions.

If parts of alternatives are chosen, the absolute least impactive scenario would be to choose the least amount of OHV systems that occur on the most resistant/resilient land with no sensitive features nearby.

The following table is a useful visual illustration to show the impacts of each proposed OHV system by alternative compared to one another.

Table 3-34. Proposed OHV system and alternative comparison for soils.

	Ranking Based on Score*			
OHV System	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3	Alternative 4
LaDee Flats	4	4	3	2
Peavine	5	5	6	4
Graham Pass	4	6	4	4
Bear Creek	5	5	8	4
Mt. Defiance	5	6	7	4
Gibson Prairie	2	2	5	4
McCubbins Gulch	4	3	2	3
Rock Creek	3	1	1	1
General Forest	1	6	9	4
Overall Predicted Impact by Alternative	**HIGHEST (1)**	**LOW (3)**	**HIGH (2)**	**LOWEST (4)**

*Scores were derived from a series of tables located in the project file at the Forest Headquarters Office in Sandy, OR.

Cumulative Effects

LaDee Flats Proposed OHV System

Within the past year, trail closures have been implemented. Revegetation should occur within a few years, which would provide a slight improvement over the current condition, as well as offset impacts that would occur from implementing one of the action alternatives, if chosen.

Bear Creek Proposed OHV System

Timber sales and numerous road closures have been implemented within the last five years. Soil monitoring in the area has shown acceptable levels of soil impacts and the overall area is recovering well compared to when all the roads were open. The proposed OHV system would not likely bring the area back to the high level of disturbance when timber sales and open roads impacted the area.

Gibson Prairie Proposed OHV System

This area receives a great deal of current and expected use: Long Prairie Grazing Allotment (grazing, fences and other design criteria); closure of illegal OHV trails; and expected impacts from vegetation, restoration, and trail projects described in the North Fork Mill Planning Area. Add to this the possibility of an OHV system, and the trend is for a spike in increased disturbance over a 5-10 year period, which would then lower and level off to a higher baseline than today.

McCubbins Gulch Proposed OHV System

In addition to the existing use, several timber sales have been implemented in this area. The most recent and the one that has the most bearing upon this particular OHV system is the Path sale. Soil quality monitoring for impacts from the timber sale will occur once the final fuel reduction treatment is implemented.

Rock Creek Proposed OHV System

As with Gibson Prairie, this area receives a great deal of current and expected use: grazing; several past and one active timber sale; underburning; and current OHV use. The disturbance trend would be similar to Gibson Prairie as well.

Peavine, Graham Pass, and Mt. Defiance Proposed OHV Systems

There are no cumulative effects expected for these OHV systems.

General Forest

Under the No Action Alternative OHVs would continue to operate off roads and trails where they are currently not restricted. Projects that influence trail tread and soil erosion, such as road and trail maintenance, reconstruction and decommissioning, fuels treatments, and timber harvest, have the potential to cumulatively impact soil when overlain with OHV use. However, locations having the potential for cumulative impacts would be very site specific and would not influence the trend for soil disturbance to be Forestwide. Under all of the action alternatives OHVs would no longer be permitted to travel off of roads and trails. Because OHVs would not operate in these locations, there would be no cumulative impacts associated with the action alternatives.

3.2.3. Incomplete and Unavailable Information

A complete inventory of current OHV impacts across the Forest is missing from this analysis.

3.3. Water Quality

This analysis is based on the information found in the Water Quality Specialist Report for this project, which is in the project record located at the Forest Headquarters Office in Sandy, Oregon.

3.3.1. Affected Environment

It has been speculated that research and study of the direct effects of OHV use on water quality has received very little attention due, in part, to the fact that research has been focused on OHV use in arid environments where aquatic environments are either seasonal or rare (Ouren et al. 2007). In some cases, scientists utilize research on effects of roads to draw parallels with potential effects from OHV trails (Ouren et al. 2007). In general, roads and OHV trails are similar in potential effects, but differ in the magnitude of some of these effects due to the smaller template (i.e., width) of a trail versus a road. Two main potential water pollutants resulting from OHVs are sediment and OHV-dispersed chemicals. Sediment can be directly introduced into surface water via tires and indirectly through erosion and runoff from trail systems. There may be up to five major processes to introduce sediment into aquatic systems from OHVs: 1) the exposure of surfaces; 2) the concentration of surface runoff in wheel ruts; 3) soil compaction and subsequent reduction of water infiltration leading to increased surface runoff; 4) backwash from the vehicles as they enter and exit a crossing; and 5) undercutting of stream banks by wave action as vehicles travel through water (Brown 1994). OHV-dispersed chemicals, such as oil and gas, can enter aquatic systems via direct flushing from spills and emissions or indirect flushing from residue that has settled on adjacent plants or soils.

Sedimentation

OHV use has the potential to increase compaction which, in turn, decreases water infiltration into soils and increases surface runoff. This runoff can mobilize and transport exposed soil particles to surface water. Iverson et al. (1981) found that this potential is highest in areas where infiltration rates are low, slopes are steep, soil types are fine grained and rainfall events are frequent and intense. In that same study Iverson et al. (1981) observed that where OHVs had traveled over the soil, surface runoff was five times greater and yielded 10-20 times more sediment than areas where there was no soil disturbance. Foltz (2006) found that there was not a statistically significant difference between OHV use levels and soil infiltration patterns, but there was a significant difference between undisturbed areas and the disturbed areas. In all cases sediment loss would be expected to increase due to OHV traffic (Foltz 2006).
Total suspended solid samples were collected at an OHV stream crossing during an Alabama study in 2003 and 2004. They found that the largest suspended sediment load contributed by the stream crossing occurred during a large rainstorm when the trail was closed (Ayala 2005). Modeling was completed on the same stream crossing and it suggested that most of the sediment load delivered to the stream was coming from a steep hillslope section that flows directly into the stream. This illustrates the role that natural physical factors like precipitation and slope play in the erosion potential of an OHV trail.

Welsh et al. (2006) attempted to quantify sediment production and delivery from unpaved roads and OHV trails in the Upper South Platte River in Colorado. Measurements including rainfall, sediment production and other road characteristics were taken on road and trail segments in the area. They found that "summer rainstorms larger than 10 mm (0.4 inches) typically produce sediment from each road and OHV segment while undisturbed areas generally produce no surface runoff"(Welsh et al. 2006). Sediment production from OHV trails was more than five times the mean value from unpaved roads.

Dust, Bacteriological and Chemical Contaminants

As described above, OHV use has the potential to introduce other chemicals into the aquatic environment. Airborne dust and contaminants absorbed to dust particles created by OHV traffic has the potential to settle out in wetlands (Forman et al. 2003). Contaminants, including petroleum products, may enter water through direct flushing. This could happen on trails, but is more likely to be a concern in staging areas where vehicles are parked and OHVs are refueled.

Shepp (1996) compared total hydrocarbon contents from automotive sources in storm runoff from four urban settings: an all-day parking lot, a busy street, a gasoline station, and a convenience store parking lot. Highest hydrocarbon concentrations were found in runoff water from the convenience store parking lot and the lowest concentrations were from the all-day parking lot. Shepp (1996) suggests that seepage from oil bearing regions of a car are greatest during "thermal expansion and contraction" or immediately after you start a car or shut it off. He observed that high concentrations of hydrocarbons in parking lots are a function of two factors: 1) the duration of automobile exposure (i.e., the time a given impervious surface is exposed to hot vehicles in a thermal expansion mode); and 2) the volume of automotive exposure (i.e., the number of hot vehicles in a thermal expansion mode exposed to a given impervious surface). This would explain why a convenience store parking lot would have high concentrations of hydrocarbons when compared to an all-day parking lot.

There is a potential for bacteriological water contamination from intensive recreation use. Introduction of fecal coliform is possible in areas that do not have toilet facilities. A discussion of this issue is included in the Fisheries section.

Analysis Area Description

Current OHV use is located in nearly every fifth (5th) field watershed on the Forest. The range of elevation and precipitation ranges from 25 to 5,400 feet and 10 to 120 inches, respectively. Following are existing conditions for each of the proposed OHV roads, trails and area.

Bear Creek Proposed OHV System

This OHV system is located within the East Fork Hood River and West Fork Hood River fifth field watersheds. There are around 4.5 miles of intermittent streams and 12.5 miles of perennial streams in the general area. Major streams include Tony Creek, Bear Creek, Boomer Creek, Marco Creek, Dry Run Creek and Tumbledown Creek. Elevations are fairly high ranging from 3,200 feet to 4,800 feet. Average annual precipitation is approximately 70 to 102 inches. Approximately 750 acres on the westside of the general area is located within the Tier 1 West Fork Hood River Key Watershed. Portions of this area are in the Clear Branch Hood River Special Emphasis Watershed.

Gibson Prairie Proposed OHV System

This OHV system is located within the Mosier Creek and Hood River fifth field watersheds. There are around five miles of intermittent streams and 7.6 miles of perennial streams in the general area. Major streams include North Fork Mill Creek, West Fork Neal Creek and Mosier Creek. Elevations range from 3,400 feet to 4,000 feet, while average annual precipitation is approximately 40 to 78 inches. Almost 3,000 acres on the south side of the analysis area is located within the Tier 1 Mill/Fivemile/Eightmile Creeks Key Watershed. Some user created trails were noted during various field visits, mostly in the Long Prairie and Gibson Prairie areas.

Rock Creek Proposed OHV System

This OHV system is located within the White River and Tygh Creek fifth field watersheds. There are around 23.3 miles of intermittent streams and 21.7 miles of perennial streams in the general area. Major streams include Souva Creek, South Fork Gate Creek, Gate Creek, Rock Creek, Wildcat Creek and Lost Creek. The general area is in a wide elevation band ranging from 2,200 feet to 5,400 feet. Average annual precipitation is highly variable ranging between approximately 18 to 90 inches. Precipitation amounts are highest on the west end and lower as you move east. All of the analysis area is located within the Tier 2 White River Key Watershed. Based on field observations, there are user created trails focused in areas north and west of Sportsman's Park and between Gate Creek and Sportsman's Park.

McCubbins Gulch Proposed OHV System

This OHV system is located within the Middle Deschutes River, White River and Beaver Creek fifth field watersheds. There are around 20 miles of intermittent streams and 11.8 miles of perennial streams in the general area. Major streams include White River, Frog Creek, Indian Creek, Clear Creek and the Clear Creek Ditch. Elevations range from 2,800 feet to 3,600 feet. Average annual precipitation is highly variable ranging between approximately 22 to 38 inches. Precipitation amounts are highest on the west end and lower as you move east. Most of the analysis area is located within the Tier 2 White River Key Watershed. This area is currently being used for motorized recreation. Numerous OHV trails were observed during field visits made during the summer of 2008. Areas of erosion and sedimentation were noted, the most severe being the area in and adjacent to the McCubbins Gulch Campground. Several OHV trails were noted in and around the McCubbins Gulch channel and riparian area and past efforts to discourage use in this area had been breached or compromised.

Peavine Proposed OHV System

This OHV system is located within the Oak Grove Fork Clackamas River and Upper Clackamas River fifth field watersheds. There are around 36 miles of intermittent streams and 17.4 miles of perennial streams in the general area. Major streams include Clackamas River, Last Creek, Warm Springs River, Peavine Creek, Pinhead Creek, Dyke Creek and Dry Creek. Elevations range from 2,800 feet to 5,000 feet. Average annual precipitation ranges between approximately 56 to 80 inches.

LaDee Flats Proposed OHV System

This OHV system is located entirely within the Middle Clackamas River fifth field watershed. There are around 15 miles of intermittent streams and ten miles of perennial streams in the general area. Major streams include North Fork Clackamas River, Boyer Creek, Clackamas River, Moore Creek and Winslow Creek. The general area is in a wide elevation band ranging from 1,400 feet to 4,600 feet. Average annual precipitation ranges between approximately 70 to 98 inches. The general area is adjacent to Tier 1 Salmon River Key Watershed, Tier 1 Roaring River Key Watershed, Tier 1 Clackamas River/Oak Grove Fork Corridors Key Watershed and Tier 2 Eagle Creek Key Watershed. This area is currently being used for motorized recreation. Numerous user-created OHV trails were observed during field visits made during the summer of 2008. Many areas of erosion and sedimentation were noted on user created OHV trails adjacent to the 4610 and 4611 road systems. These trails were less frequent on the eastern side of the area due to steeper topography that limited off-road use.

Graham Pass Proposed OHV System

This OHV system is located within the Collawash River and Upper Clackamas River fifth field watersheds. Major streams in the general area include Clackamas River, Hunter Creek, Collawash River, Berry Creek, Rhododendron Creek and Lowe Creek. Elevations range from 2,800 feet to 5,200 feet. Average annual precipitation ranges between approximately 70 to 90 inches. Portions of the general area are located within the Tier 1 Collawash River Key Watershed and the Upper Collawash River Special Emphasis Watershed.

Mt. Defiance Proposed OHV System

This OHV system is located within the Hood River and West Fork Hood River fifth field watersheds. The major stream in the area is Ditch Creek. Elevations range from 3,000 feet to 4,200 feet and average annual precipitation ranges between approximately 50 to 80 inches.

Drinking Water

Surface and groundwater drinking water protection areas were delineated by the Oregon Department of Environmental Quality (ODEQ) and Oregon Health Division (OHD) in response to source water assessments required by the 1996 Amendments to the federal Safe Drinking Water Act (SDWA). DEQ and OHD were required to delineate the groundwater and surface water source areas which supply public water systems, inventory each of those areas to determine potential sources of contamination, and determine the most susceptible areas at risk for contamination. Public water systems with greater than three hook-ups or serving more than 10 people, year-round are regulated by the requirements in the SDWA.

Watersheds originating on the Forest supply high quality drinking water to approximately one million people in Oregon. There are fifteen drinking water source areas including the City of Estacada, Hood River, The Dalles and the Timber Lake Job Corps (Table 3-35) on the Forest that contain proposed OHV roads, trails and area in them. Nine of the fifteen areas are surface water sources while six source water areas are groundwater. The table below shows the fifteen drinking water source areas and which alternative has proposed OHV roads, trails and area in them.

Table 3-35. Proposed OHV roads, trails and area within drinking water source areas by alternative.

Drinking Water Source Areas and Water Source	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Canby Utility Board-Molalla River	X			
City of Estacada-Clackamas River	X	X	X	X
City of Molalla-Molalla River	X			
City of Sandy-Alder Creek	X			
Clackamas River Water-Clackamas River	X			
Corbett Water District-N. Fk. and S.Fk. Gordon Creek	X			
Rhododendron Summer Homes Assoc.-Henry Creek	X			
The Dalles (Water Treatment)-Dog River and S. Fk. Mill Creek	X	X		
USFS Ripplebrook RS/Timberlake Job Corps-Frog Lake*	X	X	X	
Crystal Springs Water District-Groundwater Source Area	X			
Government Camp Water System-Groundwater Source Area	X			
City of Hood River-Groundwater Source Area	X			
Oak Grove Water Company-Groundwater Source Area	X		X	
Sportsmans Park Water Association-Groundwater Source Area	X			
USFS Timberline Lodge-Groundwater Source Area	X			

*Frog Lake is a back-up water source for the Timber Lake Job Corps. The primary water source is a well.

Clean Water Act

Rivers, streams, and lakes within and downstream of the proposed OHV locations are used for boating, fishing, swimming, and other water sports. Additionally, Forest streams provide habitat and clean water for fish and other aquatic biota, each with specific water quality requirements. The Clean Water Act (CWA) protects water quality for all of these uses. The CWA requires States to set water quality standards to support the beneficial uses of water. The Act also requires States to identify the status of all waters and prioritize water bodies whose water quality is limited or impaired. For Oregon, the DEQ develops water quality standards and lists water quality limited waters. In addition, Region 6 of the Forest Service has entered into a Memorandum of Agreement (MOA) with the Oregon State DEQ to acknowledge the Forest Service as the Designated Management Agency for implementation of the CWA on National Forest lands.

In an effort to support the CWA, the Forest conducts a variety of monitoring and inventory programs to determine status of meeting state water quality standards as well as other regulatory and agency requirements. In an average year, approximately 60 sites are monitored for water temperature throughout the Forest. In addition, other water quality monitoring occurs at various locations throughout the Forest depending on the year. This could be turbidity monitoring, instream sediment sampling, water chemical sampling or surveys of physical stream conditions. Currently, approximately 20 miles of physical stream habitat is surveyed every year and to date approximately 1200 miles of stream have been surveyed. Information collected during these surveys includes the number of pools and riffles, the amount of large wood, riparian area condition and types and numbers of fish and other aquatic organisms to name a few of the parameters.

Various portions of ten streams on the Forest are in or adjacent to proposed OHV locations that do not meet Federally-approved state water quality standards (www.deq.state.or.us/wq/standards/wqstdshome.htm), and are now listed as Category 5 water quality limited under Section 303(d) of the CWA on the DEQ 2004 303(d) list. Streams on the Forest that are on the 303(d) list are shown in Table 3-36, along with the listed parameter.

Table 3-36. Streams on the Forest that are in or adjacent to proposed OHV locations and do not meet Federally-approved state water quality standards. These streams are listed as Category 5 water quality limited under Section 303(d) of the Clean water Act on the DEQ 2004 list. The parameter for which they are limited is listed below.

Sub-basin	Stream	Listed Parameter(s)
Clackamas	Clackamas River	Water Temperature
	Collawash River	Water Temperature
	Nohorn Creek	Water Temperature
Lower Deschutes	Clear Creek	Water Temperature
	Gate Creek	Water Temperature
	Rock Creek	Water Temperature
	White River	Water Temperature
Middle Columbia-Hood	Mosier Creek	Water Temperature
	North Fork Mill Creek	Water Temperature
	Mill Creek	Water Temperature

Water temperature standards are based on the seven-day average maximum temperature (a running average over seven days is used instead of the daily average temperature). Streams listed for temperature that do not meet the following current state water quality criteria for salmonids are:

- Clackamas River, White River, Gate, Rock and Clear Creeks: salmon and steelhead summer rearing (64 °F); and,
- Mosier, North Fork Mill and Mill Creeks: Year around salmon and trout rearing and migration (64.4 °F).
- Collawash River: Core cold water habitat (60.8 °F).
- Nohorn Creek: Salmon and steelhead spawning (55.4 °F).

By direction of the CWA, where water quality is limited, DEQ develops Total Maximum Daily Load (TMDL) plans to improve water quality to support the beneficial uses of water. For water quality limited streams on National Forest System lands, the Forest Service provides information, analysis, and site-specific planning efforts to support state processes to protect and restore water quality. To date, three TMDL plans have been completed on the Forest (Clackamas River in 2006; Sandy River in 2005; and West Hood Subbasin in 2002). The Miles Creek TMDL plan was submitted for approval to the EPA on December 29, 2008 while the other basins are planned for completion in the next few years. Once the TMDL plans are completed, streams would be removed from the Category 5 303(d) list and stream recovery would be achieved through an implementation plan. Forest Service requirements for the two completed TMDL plans are to follow Forest Plan and Northwest Forest Plan measures that protect and restore water quality. Actions associated with this project would be consistent with all of the TMDL plans.

In addition, a Water Quality Restoration Plan (WQRP) has been prepared for Fish Creek (Clackamas River watershed) and a draft WQRP has been prepared for the headwaters of Fivemile Creek, Eightmile Creek, Fifteenmile Creek and Ramsey Creek by the Forest Service. The purpose of the WQRP is to identify sources and causes of pollution, make recommendations for Best Management Practices (BMP) and restoration to reduce levels of potential pollutants, display any new monitoring that is pertinent to the 303(d) listing parameters and a proposed time-table for completing the restoration work. Information from the WQRP is often used by DEQ to develop their TMDL plan.

The original water temperature 303(d) listing for Fish Creek is based on water temperature monitoring data. The WQRP recommended riparian planting where existing stream shading was insufficient and also riparian thinning to promote more rapid forest growth and shade recovery along streams.

The original 303(d) listing for the other segments identified above is based on information contained in the 1994 Miles Creek Watershed Analysis (US Forest Service 1994). According to the draft WQRP, fine sediment levels have been reduced in all sample sites in Eightmile Creek and all but one sample site in Fifteenmile Creek between 1994 and 2000. The WQRP attributes the reduction, at least in part, to the implementation of a number of restoration projects that occurred after 1994. The draft WQRP goes on to make several recommendations including continued restoration as funding allows, continued fine sediment monitoring, and implementation of BMP for Forest management activities.

Northwest Forest Plan Aquatic Conservation Strategy Objectives

In order for a project to proceed, "a decision maker must find that the proposed management activity is consistent with the Aquatic Conservation Strategy objectives" (NWFP ROD B-10). The nine objectives are listed on page B-11 of the Northwest Forest Plan Record of Decision. Portions of the effects analysis in this section will focus on key parameters or indicators that make up elements of the nine Aquatic Conservation Strategy objectives to determine if the project would restore, maintain, or degrade these indicators. Once this determination is made, the indicators are examined together with the Range of Natural Variability to ascertain whether the project is consistent with the objectives. The following table displays specific indicators that comprise the Aquatic Conservation Strategy objectives and the effects section that covers this indicator in the EIS.

Table 3-37. ACS indicators and where they are discussed in this EIS.

Indicators	Analysis Found in the Effects Section(s) of the EIS
Water Temperature	Water Quality
Sediment	Soils, Water Quality, Fisheries
Chemical Contamination	Water Quality, Fisheries
Physical Barriers	Water Quality, Fisheries
Substrate	Fisheries
Large Woody Debris	Fisheries
Pool Frequency	Fisheries
Pool Quality	Fisheries
Off-Channel Habitat	Fisheries
Refugia	Fisheries
Width/Depth Ratio	Fisheries
Streambank Condition	Water Quality, Fisheries
Floodplain Connectivity	Water Quality, Fisheries
Peak/base Flows	Water Quality
Drainage Network Increase	Water Quality
Riparian Reserves	Water Quality, Fisheries

As stated above, a description of the range of natural variability of the "important physical and biological components" is necessary for determining whether a project "meets" or "does not prevent attainment" of the Aquatic Conservation Strategy objectives (NWFP ROD B-10). A summary of the range of natural variability pertaining to the important physical component of sedimentation is included in Appendix H of this document. In general, natural sediment input tends to be episodic in nature and large pulses are associated with natural disturbances such as floods and fires.

Key Watersheds

The Northwest Forest Plan utilizes Key Watersheds as one of the four components of the Aquatic Conservation Strategy (ACS). Key Watersheds are defined as "A system of large refugia comprising watersheds that are crucial to at-risk fish species and stocks and provide high quality water" (NWFP ROD, B-12). These refugia include areas of high quality habitat as well as habitat that has been degraded. This habitat can either be the focus of restoration efforts or efforts to maintain the high quality habitat depending on the area. Tier 1 Key Watersheds "contribute directly to conservation of at-risk anadromous salmonids, bull trout, and resident fish species" while Tier 2 Key Watersheds are "important sources of high quality water" (NWFP ROD, B-18). As discussed above, proposed OHV systems are within or adjacent to several Key Watersheds on the Forest. The table below displays those locations.

Table 3-38. Proposed OHV systems located in Key Watersheds.

OHV Location	Key Watershed				
	West Fork Hood River – Tier 1	Mill – Tier 1	White River – Tier 2	Roaring River – Tier 1	Collawash River – Tier 1
Bear Creek	X				
Gibson Prairie		X			
Rock Creek			X		
McCubbins			X		
LaDee Flats				X	
Graham Pass					X

Groundwater

Groundwater is found throughout the Forest. Groundwater depths vary considerably and range from a few feet to hundreds of feet from the ground surface. Geologic conditions, soil type and precipitation are a few factors that help determine groundwater characteristics. The direction and speed with which groundwater moves is controlled by the slope of the water table and aquifer permeability. Aquifer permeability is a measure of how easy it is for groundwater to move through the geologic material that makes up the aquifer. The steeper the slope of the water table and the higher the aquifer permeability, the faster groundwater would move through a geologic formation. Depending on conditions, it can take anywhere from several hours to many decades for groundwater to move through an aquifer. Groundwater traditionally comes in contact with surface streams, lakes or ponds in the form of seeps or springs. These seeps or springs can be sources of high quality water due to their clean, cold condition.

Riparian Conditions and Riparian Reserves

Native riparian vegetation plays a key role in forming aquatic habitat for fish and other aquatic species. Roots help stabilize stream banks, preventing accelerated bank erosion and providing for the formation of undercut banks, important cover for juvenile and adult fish. Riparian areas with native vegetation could supply downed trees (large wood) to streams. In turn, downed trees in streams influence channel morphology characteristics such as longitudinal profile; pool size, depth, and frequency; channel pattern; and channel geometry. Turbulence created by large wood increases dissolved oxygen in the water needed by fish, invertebrates and other biota. The extent of the hyporheic zone adjacent to and under the stream surface is increased by large wood in streams.

Riparian forest canopy protects streams from solar radiation in summer, and could moderate minimum winter nighttime temperature, preventing the incidence of anchor ice or freeze-up in streams (Beschta et al. 1987). Changes in water temperature regime could affect the survival and vigor of fish, and affect interspecies interactions (FEMAT 1993).

Riparian areas are dynamic. Disturbances characteristic of uplands such as fire and windthrow, as well as disturbances associated with streams, such as channel migration, floods, sediment deposition by floods and debris flows, shape riparian areas (FEMAT 1993).

As part of the Aquatic Conservation Strategy in the Northwest Forest Plan, Riparian Reserves were established “along streams and unstable and potentially unstable areas where special standards and guidelines direct land use” (NWFP ROD, B-12). Riparian Reserves are “portions of watershed where riparian-dependent resources receive primary emphasis” and standards and guidelines “prohibit and regulate activities…that retard or prevent attainment of the Aquatic Conservation Strategy objectives” (NWFP ROD, B-12). Riparian Reserve widths vary depending on the type of stream, wetland or unstable area. Riparian Reserves and associated riparian areas are located within every proposed OHV location.

Summary of Affected Environment

Water quality may be influenced through the introduction of sediment and other chemical and bacteriological contaminants which will be the focus of the water quality effects analysis. Some of these effects have been observed during field visits to current motorized trail systems on the Forest. Proposed OHV locations are located in a variety of aquatically sensitive areas including Key Watersheds, Riparian Reserves, drinking water source areas, and Special Emphasis Watersheds.

3.3.2. Effects Analysis

Alternative 1 – No Action

Direct and Indirect Effects – Water Quality (Soil Disturbance, Turbidity, and Fine Sediment)

As described in the Affected Environment section, OHV use has the potential to influence a variety of water quality parameters. These include stream temperature, large wood recruitment, erosion and sedimentation, stream channel morphology, peak and base flows and riparian area condition. Several of the channel related effects are discussed in the Fisheries and Soils sections. It is expected that OHV use will have a minimal effect on stream temperature. Some vegetation has been removed to clear a trail for these crossings. Due to the narrow width needed for the trail (2' to 3' tread width; 6' to 8' clearing width), very little vegetation that currently provides shade is expected to be removed, so no increase of stream temperature is anticipated from this activity. This conclusion is based on professional judgment that includes examination of many stream/trail crossings throughout the National Forest system. It is expected that this is the case for both changes in peak and base streamflows and large wood recruitment to streams as well. The major potential effects identified in research, monitoring and personal field reviews are erosion, sedimentation, chemical contamination and riparian area condition. These will be the focus of more detailed analysis in this water quality effects section.

OHV use has the potential to increase erosion and resulting sedimentation (as described in the Affected Environment section above). In addition, OHVs have the potential to disturb or displace soil, making the soil more vulnerable to erosion. Alternative 1 proposes to maintain OHV trails utilizing the existing road network open to OHV use and the existing motorized trail network. Following is a description of each of the trail types and the resulting expected erosion and sedimentation.

Mixed Use Roads: These are approximately 2,463 miles of existing roads that are currently open to OHV traffic on the Forest. It is expected that these roads have a neutral to slight increase in erosion due to OHV use. Non-highway legal vehicles may be operated in a manner that increases road surface erosion; research has found the combination of vehicle and skill result in faster and more aggressive moves on slopes and curves (Foltz and Meadows 2007). These moves have the potential to dislodge more soil particles which in turn may increase erosion and sedimentation.

Existing Motorized Trails: There are about 49 miles of motorized trails that are currently part of the Mt. Hood National Forest trail system. Existing trails have a risk of erosion and sedimentation as described in the Affected Environment section.

Land Allocations That Do Not Prohibit Cross-country OHV Travel: Several land allocations in the Forest Plan currently do not prohibit cross-country OHV travel. OHVs are not prohibited from cross-country travel on approximately 394,886 acres of land. This cross-country travel has the potential to increase erosion and sedimentation due to lack of project design criteria (PDC) on OHV routes and stream crossings, OHV use on steep slopes and erosive soils and uncontrolled stream crossings.

Staging Areas: Currently OHV riders stage at a variety of locations around the Forest. These areas can be wide spots in roads, log landing areas, quarries or other spots wide enough to park in. Erosion risk is highly variable and depends on the soil types in these areas and the level of use. Staging areas located in quarries or log landings likely have a lower risk of increased erosion and sedimentation due to the lack of soils and abundance of exposed bedrock and/or surface rock. Staging areas located in sites other than quarries will have an increased risk of erosion due to loss of vegetation and disturbance.

The following table displays the current amount of OHV roads and trails by 5th field watershed. As displayed in the table, for Alternative 1, approximately 2,463 miles of road, 49 miles of trail and 394,886 miles of land are available for OHV use. The information has been broken down into: 1) roads where OHV use is allowed; 2) existing motorized trail systems; and 3) acres of land allocations that do not prohibit cross-country motorized vehicle travel.

Table 3-39. Total OHV road and trail miles by 5th field watershed for Alternative 1.

5th Field Watershed	Roads (mi)	Motorized Trail (mi)	Cross-country Travel (ac)
Beaver Creek	9.8	4.6	1,321
Bull Run River	9.6	0	1,384
Collawash River	250.2	4.0	17,566
Columbia Gorge Tributaries	0	0	301
Eagle Creek	23.4	0	3,094
East Fork Hood River	143.1	0	32,058
Fifteenmile Creek	42.4	0	2,502
Fivemile Creek	71.4	0	5,130
Hood River	24.9	0	5,319
Lower Clackamas River	10.3	0	1,856
Lower Molalla River	2.3	0	231
Lower Sandy River	1.2	0	9.1
Middle Clackamas River	322.2	0	43,365
Middle Columbia/Eagle Creek	5.8	0	295
Middle Columbia/Grays Creek	0.7	0	419
Middle Columbia/Mill Creek	23.3	4.0	930
Middle Deschutes River	13.9	9.7	1,319
Middle Sandy River	23.2	0	4,958
Mosier Creek	7.3	0	0
North Fork Breitenbush River	0	0	0.8
Oak Grove Fork Clackamas River	320.7	0	63,994
Salmon River	87.0	0	21,098
Tygh Creek	90.1	0	7,109
Upper Clackamas River	377.6	6.4	64,456
Upper Molalla River	2.7	0	1,653
Upper Sandy River	18.0	0	7,630
Warm Springs River	38.9	0	9,769
West Fork Hood River	116.0	0	26,564
White River	416.3	19.8	65,355
Zigzag River	10.8	0	5,195
Grand Total	**2,463**	**48.5**	**394,881**

In general, the closer a disturbance is to surface water, the higher the risk of sediment delivery to that waterbody. Many different studies have analyzed the likelihood of sediment delivery with differing vegetative buffer widths. Vegetated buffer widths effective for reducing or eliminating sediment delivery are quite variable, but generally range from 30 to 100 feet or more, depending on a variety of physical site characteristics (Rashin et. al. 2006, Burroughs and King 1989, Packer 1967, NWFP ROD 1994, Riedel 2006). The table below displays the miles of trail within 100 feet of surface water for Alternative 1. Based on research cited above, this will be used as a general indication of the relative risk of sedimentation. In addition, miles of OHV roads and trails within Riparian Reserves will be used later to characterize potential OHV effects to other riparian area features.

Table 3-40. Total OHV road and trail miles within 100 feet of streams by 5th field watershed for Alternative 1.

5th Field Watershed	Road (mi)	Motorized Trail (mi)
Beaver Creek	1.1	0.2
Bull Run River	0.6	0
Collawash River	28.6	0.1
Eagle Creek	2.3	0
East Fork Hood River	9.1	0
Fifteenmile Creek	1.8	0
Fivemile Creek	5.2	0
Hood River	1.6	0
Lower Clackamas River	1.5	0
Lower Molalla River	0.2	0
Middle Clackamas River	30.7	0
Middle Columbia/Eagle Creek	0.2	0
Middle Columbia/Mill Creek	0.7	0
Middle Deschutes River	2.1	1.0
Middle Sandy River	2.3	0
Mosier Creek	0.3	0
Oak Grove Fork Clackamas River	26.9	0
Salmon River	7.3	0
Tygh Creek	6.1	0
Upper Clackamas River	28.1	0.3
Upper Molalla River	0.03	0
Upper Sandy River	3.2	0
Warm Springs River	3.1	0
West Fork Hood River	11.7	0
White River	24.2	1.4
Zigzag River	1.5	0
Grand Total	**200.3**	**2.9**

As described in the Affected Environment section above, stream crossings can provide an avenue for sediment introduction because they are directly connected to stream channels. The table below shows the number of stream crossings by OHV roads and trails for Alternative 1 by 5th field watershed.

Table 3-41. Total OHV route stream crossings by 5th field watershed for Alternative 1.

5th Field Watershed	Stream Crossings on Roads (number of crossings)	Stream Crossings on Motorized Trail (number of crossings)
Beaver Creek	13	2
Bull Run River	8	0
Collawash River	521	0
Eagle Creek	47	0
East Fork Hood River	180	0
Fifteenmile Creek	28	0
Fivemile Creek	33	0
Hood River	10	0
Lower Clackamas River	28	0
Middle Clackamas River	548	0
Middle Columbia/Eagle Creek	4	0
Middle Columbia/Mill Creek	30	0
Middle Deschutes River	22	10
Middle Sandy River	29	0
Mosier Creek	4	0
Oak Grove Fork Clackamas River	377	0
Salmon River	112	0
Tygh Creek	75	0
Upper Clackamas River	461	4
Upper Sandy River	141	0
Warm Springs River	32	0
West Fork Hood River	206	0
White River	436	12
Zigzag River	31	0
Grand Total	**3,376**	**28**

As is displayed in the tables above, current OHV use and associated erosion and sedimentation is spread throughout most of the watersheds in the Forest.

Direct and Indirect Effects – Drinking Water

Several drinking water source areas are located within some of the existing OHV roads and trails. The following tables display the miles of OHV roads and trails in surface and groundwater drinking water source areas for Alternative 1.

Table 3-42. Miles of OHV roads and trails located in drinking water source areas that have a surface water source.

Surface Drinking Water Source Areas	Road (mi)	Motorized Trail (mi)
Canby Utility Board	2.5	0
City of Estacada	979.9	10.4
City of Molalla	2.7	0
City of Sandy	7.8	0
Clackamas River Water	33.7	0
Corbett Water District	1.2	0
Rhododendron Summer Homes Association	2.0	0
The Dalles (Water Treatment)	8.5	0.5
USFS Ripplebrook RS/Timberlake Job Corps	290.8	0
Grand Total	**1,329**	**10.8**

Table 3-43. Miles of OHV roads and trails located in drinking water source areas that have a groundwater source.

Groundwater Drinking Water Source Areas	Roads (mi)	Motorized Trail (mi)
Crystal Springs Water District	9.3	0
Government Camp Water System	0.1	0
City of Hood River	32.9	0
Oak Grove Water Company	3.71	0
Sportsmans Park Water Association	0.7	0
USFS Timberline Lodge	0.30	0
Grand Total	**47.0**	**0**

Direct and Indirect Effects – Riparian Areas and Riparian Reserves

As described in the Affected Environment section above, riparian areas provide numerous benefits to water quality including woody material, stream temperature protection, bank stabilization and buffering ability to protect water quality. The Northwest Forest Plan established Riparian Reserves in recognition of these benefits. Riparian Reserves are established around streams, wetlands, ponds, lakes and unstable areas. The amount of area currently open to OHV use in Riparian Reserves is displayed by 5th field watershed in the table below.

Table 3-44. Total OHV road and trail miles within Riparian Reserves by 5th field watershed for Alternative 1.

5th Field Watershed	Roads (mi)	Trails (mi)
Beaver Creek	1.2	0.2
Bull Run River	2.1	0
Collawash River	71.9	0.1
Eagle Creek	5.7	0
East Fork Hood River	25.8	0
Fifteenmile Creek	4.2	0
Fivemile Creek	9.2	0
Hood River	5.8	0
Lower Clackamas River	2.5	0
Lower Molalla River	0.2	0
Lower Sandy River	0.1	0
Middle Clackamas River	69.9	0
Middle Columbia/Eagle Creek	0.3	0
Middle Columbia/Mill Creek	2.8	0
Middle Deschutes River	2.6	1.6
Middle Sandy River	4.5	0
Mosier Creek	0.6	0
Oak Grove Fork Clackamas River	62.3	0
Salmon River	14.8	0
Tygh Creek	11.2	0
Upper Clackamas River	64.5	0.3
Upper Molalla River	0	0
Upper Sandy River	7.0	0
Warm Springs River	5.6	0
West Fork Hood River	25.8	0
White River	48.3	2.2
Zigzag River	3.6	0
Grand Total	**452.6**	**4.3**

Direct and Indirect Effects – Chemicals and Bacteriological Contaminants

Chemicals, such as hydrocarbons, have the potential to be introduced into adjacent surface and groundwater through vehicle leakage, incidental spills while refueling vehicles and indirectly through dust and flushing of residue from vegetation. Since parking and refueling can currently happen anywhere on the Forest, it is difficult to predict the effect to water quality. Larger OHV staging areas exist only in a few locations, so spills and leakage are expected to be very small. The amount and location of indirect introduction from dust and vegetation should roughly correlate to the 5th field watersheds listed in the tables above.

As described in the Affected Environment section, there is a potential for bacteriological water contamination from intensive recreation use. Introduction of fecal coliform is possible in areas that do not have toilet facilities. A discussion of this issue is included in the Fisheries section.

Summary of Direct and Indirect Effects for Alternative 1

Implementation of Alternative 1 maintains the current areas available for OHV use. The amount of potential indirect and direct erosion and resulting sedimentation would increase across the Forest as OHV use increases.

Table 3-45. Summary of water quality indicators for Alternative 1.

Water Quality Effects Measure	Alternative 1
Miles of OHV roads and trails within 100 feet of a stream	203 miles
Number of stream crossings	3,404
Miles of OHV roads and trails in drinking water source areas	1,387 miles
Miles of OHV roads and trails within Riparian Reserves	457 miles

Alternative 1 will be used as a baseline and a basis for comparing the other alternatives with. This comparison is included in the description of the effects for Alternatives 2, 3 and 4.

Cumulative Effects for Alternative 1

Most of the existing OHV locations and areas of use on the Forest are upstream of other sources of sediment and OHV derived chemicals on both non-Federal and Federal lands. Where streams flow through other land ownerships (BLM, Federal, State, Tribal, or private), the potential exists for sediments and OHV derived chemicals originating from OHV locations on the Forest to mix with those originating from sites on and off-National Forest System lands. The effects could be additive or synergistic in nature.

The table below provides a qualitative summary of potential cumulative watershed effects for Alternative 1. It shows existing and potential projects, effects from those projects that may result in cumulative effects with this project, whether these projects overlap in time and space and an assessment if a measurable cumulative effect is expected. Findings of this summary are supported by the analysis above which utilizes pertinent research, project design criteria, and applicable management standards and guidelines.

Table 3-46. Cumulative effects summary for Alternative 1.

Project	Potential Effects	Overlap in		Measurable Cumulative Effect?	Extent, Detectable?
		Time	Space		
Existing Forest Service Timber Harvest Units	Suspended Sediment	No	Yes	No	Projects are completed. No remaining sediment effects due to mitigation measures and design criteria implementation on the original projects and natural recovery.
Forest Service Vegetation Treatment Activities Planned or Underway (The Dalles Watershed Fuelbreak, North Fork Mill Restoration Project, Sportsman's Park Hazardous Fuels Reduction, No Whisky Plantation Thinning, Upper Clackamas Plantation Thinning, Cascade Crest Fuel Break Project, Pre-commercial treatments)	Suspended Sediment	Yes	Yes	Yes	There may be an overlap in timing and location of these projects with this project. These projects have a chance of some short-term introduction of fine sediment that may mix with fine sediment from this OHV project. Some of the high risk areas would be in Neal Creek and West Fork Neal Creek due to North Fork Mill Restoration Project culvert replacements, road reconstruction on the 1700 road, OHV use on Hood River County lands, existing Long Prairie Grazing Allotment damage, and timber harvest on private lands. Other listed projects have a low risk of cumulative effects due to implementation of project design criteria that minimize erosion and sediment input.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to project design criteria implementation and conformance with existing standards and guidelines on the existing projects.

Table 3-46. (continued)

Project	Potential Effects	Overlap in		Measurable Cumulative Effect?	Extent, Detectable?
		Time	Space		
Private Land Activities (SDS Timber Harvest, City of The Dalles Timber Harvest, Hood River County Trails Project)	Suspended Sediment	Yes	Yes	Yes	Some projects are completed so there are no remaining sediment effects due to natural recovery. Other ongoing projects on adjacent private land, such as road maintenance and vegetation manipulation, have a chance of some short-term introduction of fine sediment that may mix with minor fine sediment from this OHV project. Some of the high risk areas would be in Neal Creek and West Fork Neal Creek due to North Fork Mill Restoration Project culvert replacements, road reconstruction on the 1700 road, OHV use on Hood River County lands, existing Long Prairie Grazing Allotment damage, and timber harvest on private lands.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to project design criteria implementation and conformance with existing standards and guidelines on the existing projects.
Miscellaneous Tree Salvage (Hazard Trees)	Suspended Sediment	Yes	Yes	Not Measurable	There may be an overlap in timing of this project with the OHV project; any minor suspended sediment would not be measurable due to implementation of project design criteria and conformance with existing standards and guidelines in the projects.
Long Prairie Grazing Allotment	Suspended Sediment	Yes	Yes	Yes	Current damage in riparian areas from grazing has a chance of some short-term introduction of fine sediment that may mix with minor fine sediment from this OHV project. The highest risk of this would be in West Fork Neal Creek due to the culvert replacement projects, road reconstruction on the 1700 road, Long Prairie Grazing allotment, OHV use on Hood River County lands, and timber harvest on private lands. Long-term restoration of a more natural sediment regime is likely with recovery due to project design criteria in the Long Prairie Grazing Allotment project coupled with road decommissioning, culvert removal/replacement and road closures associated with the North Fork Mill Restoration Project.

Table 3-46. (continued)

Project	Potential Effects	Overlap in Time	Overlap in Space	Measurable Cumulative Effect?	Extent, Detectable?
Ongoing road and trail maintenance	Suspended Sediment	Yes	Yes	Yes	There may be an overlap in timing and location of these projects with the OHV project. These projects have a chance of some short-term introduction of fine sediment that may mix with fine sediment from the OHV project. Some of the high risk areas would be in Neal Creek and West Fork Neal Creek due to North Fork Mill Restoration Project culvert replacements, road reconstruction on the 1700 road, OHV use on Hood River County lands, existing Long Prairie Grazing Allotment damage, and timber harvest on private lands. Other areas of potential concern include McCubbins Gulch and Cabin Creek in the Peavine area due to the number of OHV stream crossings and native surface roads.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to project design criteria implementation and conformance with existing standards and guidelines on the existing projects.
Invasive Plant Treatments	Suspended Sediment	Yes	Yes	Not Measurable	There may be an overlap in timing of this project with the OHV project; any minor suspended sediment would not be measurable due to implementation of project design criteria and conformance with existing standards and guidelines in the projects.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to project design criteria implementation and conformance with existing standards and guidelines on the existing projects.
Past Aquatic Restoration Projects	Suspended Sediment	No	Yes	Not Measurable	There may be an overlap in timing of these project effects with the OHV project. Any minor suspended sediment may slightly slow the recovery resulting from restoration project implementation, but this would not be measurable due to implementation of project design criteria and conformance with existing standards and guidelines in the projects.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to implementation of project design criteria and conformance with existing standards and guidelines on the existing projects.

Table 3-46. (continued)

Project	Potential Effects	Overlap in		Measurable Cumulative Effect?	Extent, Detectable?
		Time	Space		
Clackamas Road Decommissioning	Suspended Sediment	Yes	Yes	Not Measurable	There may be a spatial and temporal overlap of effects of this project with this OHV project. Any minor suspended sediment may slightly slow the recovery resulting from restoration project implementation but this would not be measurable due to implementation of design criteria and conformance with existing standards and guidelines in all projects on the Forest.
Future Aquatic Restoration Projects	Suspended Sediment	Yes	Yes	Not Measurable	There may be a spatial overlap of these project effects with this OHV project. Any minor suspended sediment may slightly slow the recovery resulting from restoration project implementation, but this would not be measurable due to implementation of project design criteria and conformance with existing standards and guidelines in all projects on National Forest.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to implementation of project design criteria and conformance with existing standards and guidelines on the existing projects.

Summary of Cumulative Effects for Alternative 1

Sediment: Measurable cumulative effects are possible as a result of sediment introduction from OHVs. The risk depends on the timing of this project and other projects listed in the table above. If these projects are spaced closely together in time (within three years of each other), there is a higher chance that there would be a measurable cumulative effect than if they are implemented over a longer period of time. This is due to the dispersal of sediment throughout the stream system as time goes on. The highest risk of a cumulative sediment effect is in Neal Creek and West Fork Neal Creek due to the amount of activity confined in a fairly small area. The highest risk portions of this project are the culvert replacement and removals since they require work in the actual stream channel.
OHV Related Chemicals: There would be little to no chance for cumulative effects related to OHV derived chemicals due to the implementation of PDC in existing and planned future projects that minimize the chance of introducing these chemicals to surface water. Some of these PDC include requirements to refuel equipment away from surface water, storage of chemicals away from surface water and providing a spill plan prior to project implementation.

Alternative 2 – Proposed Action

Direct and Indirect Effects for Water Quality (Soil Disturbance, Turbidity and Fine Sediment)

As described in the Affected Environment section above, OHV use has the potential to increase erosion and resulting sedimentation. In addition, OHVs have the potential to disturb or displace soil, making the soil more vulnerable to erosion. Alternative 2 proposes to establish a series of OHV trails utilizing the existing road network, the existing motorized trail network and construction of new motorized trails. In addition, some existing roads would be decommissioned as part of this alternative. Following is a description of each of the trail treatments and the resulting relative change in erosion and sedimentation from Alternative 1.

Mixed Use Roads: These are existing roads that are open to OHVs in Alternative 1 and would continue to be open to OHV traffic. It is expected that these roads would have a neutral to slight increase in erosion due to increased OHV traffic. Non-highway legal vehicles may be operated in a manner that increases road surface erosion; research has found the combination of vehicle and skill result in faster and more aggressive moves on slopes and curves (Foltz and Meadows 2007). These moves have the potential to dislodge more soil particles which in turn may increase erosion.

Roads Converted to Trails: These are roads that are currently on the road system and would be converted to OHV use only. The roads are either closed or open to high clearance vehicles (cars, trucks and OHV) in Alternative 1. It is expected that these routes would have either a slight decrease to slight increase in erosion. Roads that are currently closed (level 1) would have a slight increase in erosion depending on the current use level of the road. If the road is used on a regular basis, this increased erosion would be less than a road that is totally closed to traffic (Wemple et al. 1996). If the road is currently open (level 2), then conversion to an OHV trail would be neutral to a slight decrease in erosion and potential sedimentation. This is because of decreased overall traffic and the stabilization of a portion of the road surface. It is assumed that roads converted to OHV trails would be allowed to revegetate and stabilize on the unused portion of the road width. The following Watershed Erosion Prediction Project (WEPP) Model runs were completed to illustrate this relationship. The model runs are for a 200 foot section of road that simulates an existing road (13 feet wide) and a road that has been converted to an OHV trail and has stabilized on the shoulder sections so only five feet of road surface is unvegetated.

Table 3-47. WEPP model run showing the potential decrease in soil erosion from a road that has been converted to an OHV trail.

Road Width (feet)	Road Prism Erosion (Pounds of soil per year)
13 ft Wide Road	413.4 lbs.
5 ft Wide Road (Road converted to trail)	158.7 lbs.

A cubic yard of soil (27 cubic feet) weighs roughly 2000 lbs (John Dodd, Mt. Hood NF Soil Scientist, personnel communication, December 2008). Therefore, a cubic foot of soil weighs approximately 75 lbs and a typical wheelbarrow holds from 4-6 cubic feet of soil (300-450 lbs). It should be noted that there would likely be some erosion from the revegetated area which is not represented in the erosion value for the five foot wide road.

Decommissioned Roads: These are roads that are currently part of the road system, but would be decommissioned. These actions would have some short-term direct and indirect increase in erosion and sedimentation, but would provide a long-term decrease in erosion and sedimentation. Pulling culverts and disturbing the road surface has the potential to dislodge soil particles. Through time the decommissioned road surface would stabilize and revegetate, which would provide an overall decrease in erosion and sedimentation when compared to Alternative 1.

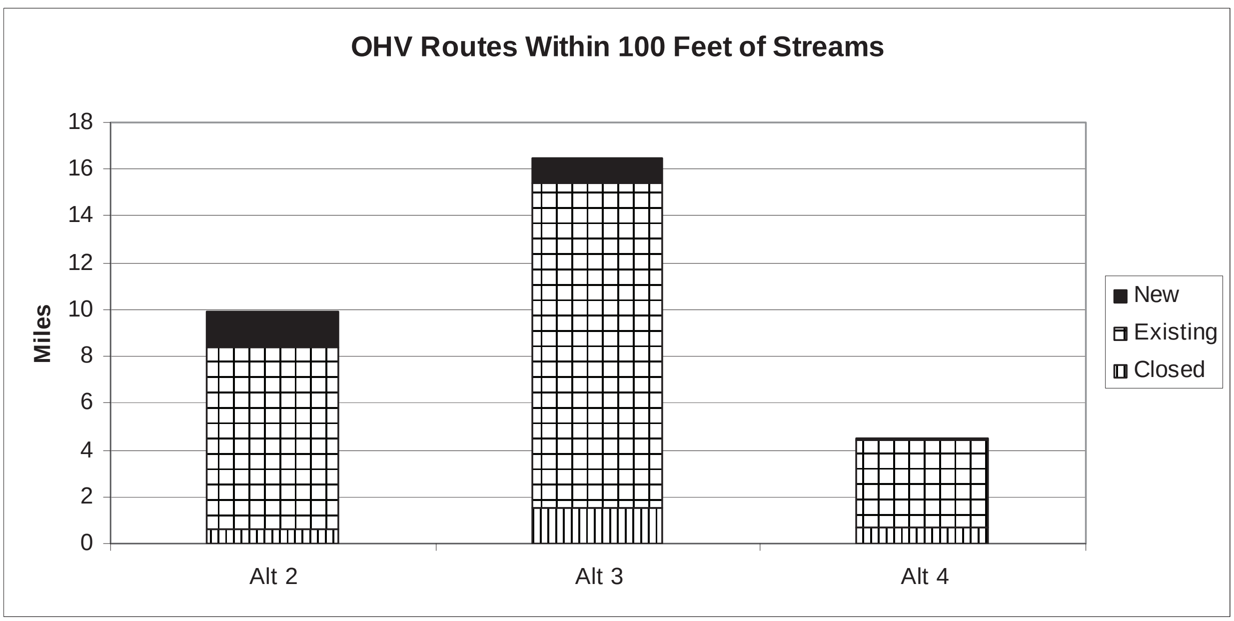
Existing and New Motorized Trails: These are motorized trails that are currently part of the Forest trail system or new trails that are proposed for construction. Existing trails would have a neutral to slightly increased risk of erosion and sedimentation depending on use levels. If use levels increase as a result of this project, then erosion and sedimentation would likely increase. New motorized trails would vary between increased and decreased erosion and sedimentation compared to Alternative 1. Areas that are currently vegetated and have low erosion rates would likely see an increased rate of erosion and sedimentation because of new ground disturbance. Sections of trail that currently exist as user-created trails would likely see neutral to decreased erosion and sedimentation due to implementation of PDC that are aimed at reducing erosion and sedimentation.

North Fork Quarry OHV Area: As described in Chapter 2, the North Fork Quarry OHV Area is a four acre rock quarry site where OHV use is currently occurring and allowed in all of the alternatives. The quarry site is not within any mapped Riparian Reserves. This use would have similar effects as those described below for staging areas in quarries and similar effects to Alternative 1. The quarry is predominately rock with little soil and has a low erosion potential.

Staging Areas: Staging areas provide parking and staging opportunities to OHV users. Even though these areas are located in previously disturbed sites, they would have a neutral to increased risk of erosion and sedimentation. Staging areas located in quarries would likely have a low risk of increased erosion and sedimentation due to the lack of soils and abundance of exposed bedrock that are resistant to erosion. Staging areas located in sites other than quarries may have an increased risk of erosion due to loss of vegetation and disturbance.

All Areas of Soil Disturbance: In general, the closer a disturbance is to surface water, the higher the risk of sediment delivery to that waterbody. Many different studies have analyzed the likelihood of sediment delivery with differing vegetative buffer widths. Vegetated buffer widths identified in research and monitoring as being effective in reducing or eliminating sediment delivery are variable. The effectiveness depends on numerous physical characteristics including slope, soil type, precipitation, and buffer composition. These buffer widths generally vary from 30 to 100 feet or more, depending on site characteristics (Rashin et al. 2006; Burroughs and King 1989; Packer 1967; NWFP ROD 1994; Riedel 2006). The figure below displays the miles of OHV roads and trails within 100 feet of surface water for the action alternatives. Based on research cited above, this width will be used as a general indication of the relative risk of sedimentation for each alternative. In addition, miles of OHV routes within Riparian Reserves will be used later to characterize potential OHV effects to other riparian area features.

Figure 3-1. OHV roads and trails within 100 feet of streams by alternative.



As displayed in the Figure above, Alternative 2 proposes to decommission 0.64 miles of road, use or convert 7.72 miles of existing roads or trails, and construct 1.55 miles of new trail within 100 feet of streams. The table below shows the length of OHV roads and trails within 100 feet of a stream by proposed treatment for the different 5th field watersheds. This table compares Alternative 1 with Alternative 2. It should be noted that 394,886 acres of land where cross-country OHV travel is currently allowed is not included in the tables below for Alternative 1. It is expected that use of this land for cross-country travel by OHVs has an increased potential for erosion and sediment introduction.

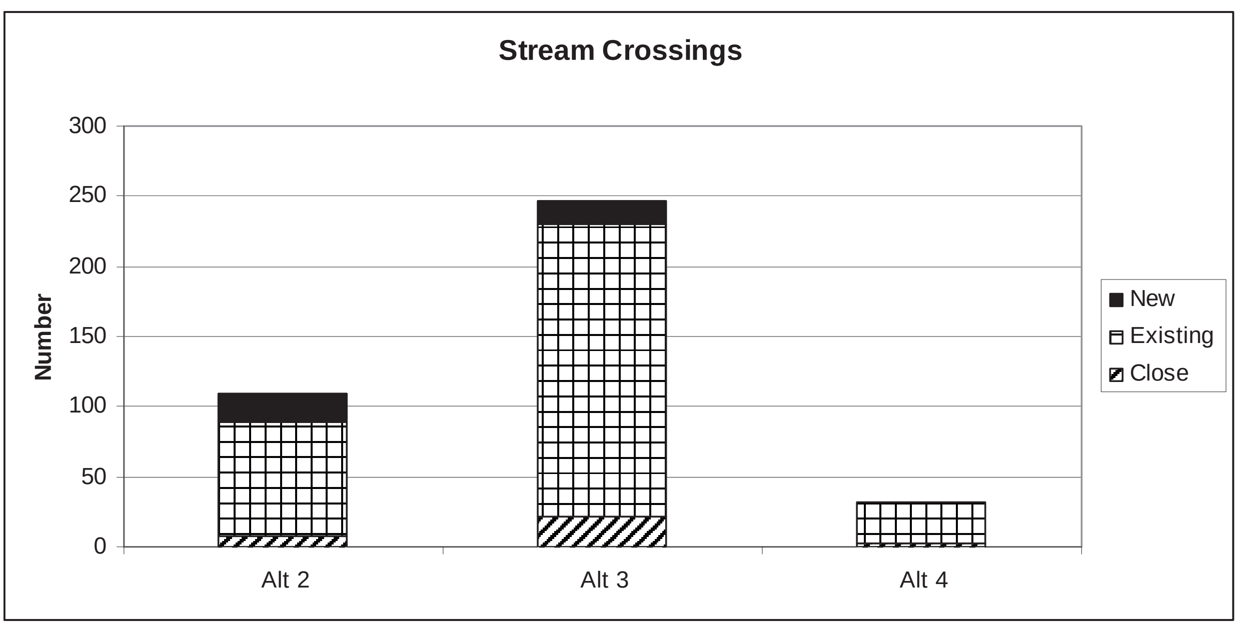
Table 3-48. Miles of OHV roads and trails within 100 feet of streams by 5th field watershed for Alternative 1 and 2.

5th Field Watershed	OHV Location	Alternative 1		Alternative 2		
		Roads (mi)	Trails (mi)	Roads (mi)	Trails-Existing (mi)	Trails-New (mi)
Beaver Creek	McCubbins Gulch	1.1	0.2	0.2	0.2	0
East Fork Hood River	Gibson Prairie, Bear Creek	9.1	0	0	0	0.9
Middle Clackama River	LaDee Flats	30.7	0	1.2	0	0
Middle Columbia/Mill Creek	Gibson Prairie	0.7	0	0.2	0	0.04
Middle Deschutes River	McCubbins Gulch	2.1	1.0	0.3	0.8	0.04
Oak Grove Fork Clackamas River	Peavine, LaDee Flats	26.9	0	0.3	0	0.2
Upper Clackama River	Peavine	28.1	0.3	0.4	0	0
Warm Springs River	Peavine	3.1	0	1.4	0	0.2
White River	McCubbins Gulch, Rock Creek	24.2	1.4	1.5	1.3	0.3
All Other 5th Field Watersheds		74.3	0.1	0	0	0
Grand Total		**200.3**	**2.9**	**5.5**	**2.2**	**1.6**

The majority of new trail construction within 100 feet of streams is proposed in the Bear Creek OHV location. These trail segments are mostly on tributaries to Tony Creek.

Stream crossings can also provide an avenue for sediment introduction because they are directly connected to stream channels. This relationship is detailed in the Affected Environment section. The figure below shows the number of stream crossings for each alternative which can be used as a measure for the potential to have direct and indirect introduction of sediment to surface water.

Figure 3-2. Stream crossings for each alternative.



As displayed in the figure above, Alternative 2 proposes to decommission seven stream crossings, use 82 crossings on existing roads or trails and construct 20 new trail crossings on streams. Thirteen of the 20 new crossings are in the Bear Creek location. Most of those 13 crossings are on either intermittent or perennial tributaries to Tony Creek or Tony Creek. The table below shows stream crossings by 5th field watershed for Alternatives 1 and 2.

Table 3-49. Number of OHV road and trail stream crossings by 5th field watershed for Alternatives 1 and 2.

5th Field Watershed	OHV Location	Alternative 1		Alternative 2		
		Road Crossings (number of crossings)	Trail Crossings (number of crossings)	Road Crossings (number of crossings)	Trail Crossings (number of crossings)	New Trail Crossings (number of crossings)
Beaver Creek	McCubbins Gulch	15	2	5	2	0
East Fork Hood River	Gibson Prairie, Bear Creek	180	0	0	0	13
Middle Clackamas River	LaDee Flats	548	0	18	0	0
Middle Columbia/ Mill Creek	Gibson Prairie	30	0	2	0	1
Middle Deschutes River	McCubbins Gulch	22	10	3	9	1
Oak Grove Fork Clackamas River	Peavine, LaDee Flats	377	0	7	0	1
Upper Clackamas River	Peavine	461	4	3	0	0
Warm Springs River	Peavine	33	0	9	0	3
White River	McCubbins Gulch Rock	436	12	13	11	1
All Other 5th Field Watersheds		1,274	0	0	0	0
Grand Total		**3,376**	**28**	**60**	**22**	**20**

Since stream crossings have been identified in research as a very important delivery mechanism for sediment, further analysis was done on the proposed stream crossings. Most of the time, native surface roads have higher erosion potential than gravel surfaced roads. Research has shown that application of a gravel surface can result in up to an 85% reduction in soil loss over a native surface (Burroughs and King 1989; Swift 1984). The following WEPP model runs show the difference in erosion and sediment delivery (shown as sediment leaving buffer in table below) between a native surface road and a gravel surface road. All of the model inputs stayed the same except surface material which was changed from native to gravel surface.

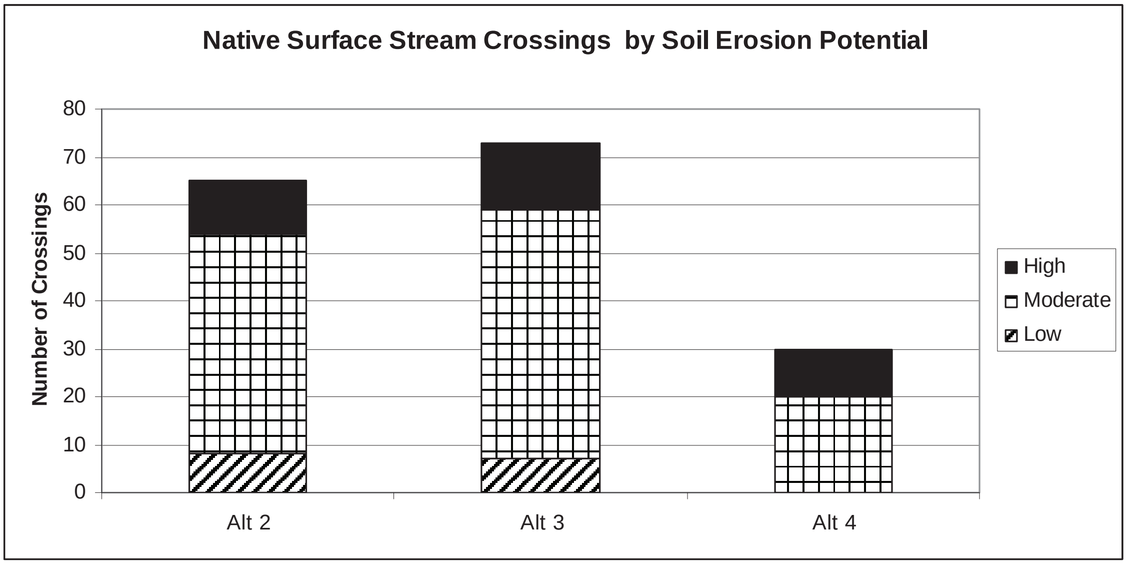
Table 3-50. WEPP model run showing the difference in erosion and sedimentation between a gravel surface road and a native surface road.

	Road Prism Erosion	Sediment Leaving Buffer
Native Surface Road	579 lbs.	111 lbs
Gravel Surface Road	349 lbs.	78 lbs.

Results from the WEPP model runs show that in this situation, the native surface road produced 579 pounds of eroded soil while the gravel surface road produced 349 pounds of eroded soil, which is a 40 percent reduction in eroded soil. It should be noted that under some circumstances, gravel surfaced roads may produce more runoff and erosion than native surface roads (WEPP manual).

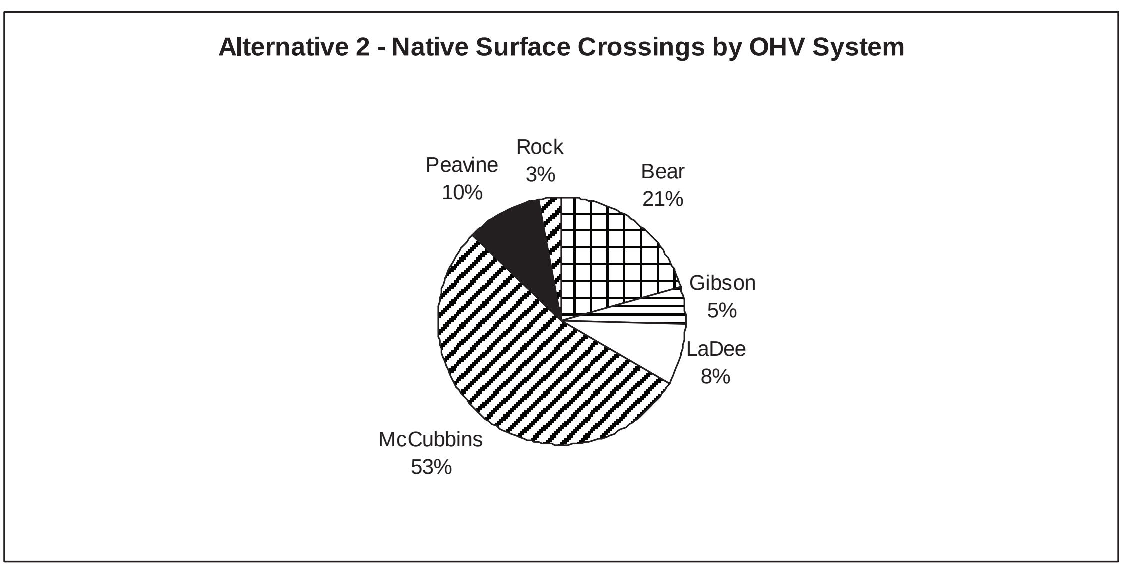
All native surface road and trail stream crossings were analyzed for erosion potential using the soil resource inventory. Native surface road and stream crossings were classified as having a high, moderate or low relative erosion potential, based on the erosion potential of the underlying soil type. That information is displayed in the figure below.

Figure 3-3. Native surface stream crossings by soil erosion potential.



Alternative 2 has 11 native surface crossings on high surface erosion potential soils, 46 crossings on moderate surface erosion potential soils and eight native surface crossings on low surface erosion potential soils. As displayed in the figure below, the majority of these crossings are in the McCubbins Gulch location.

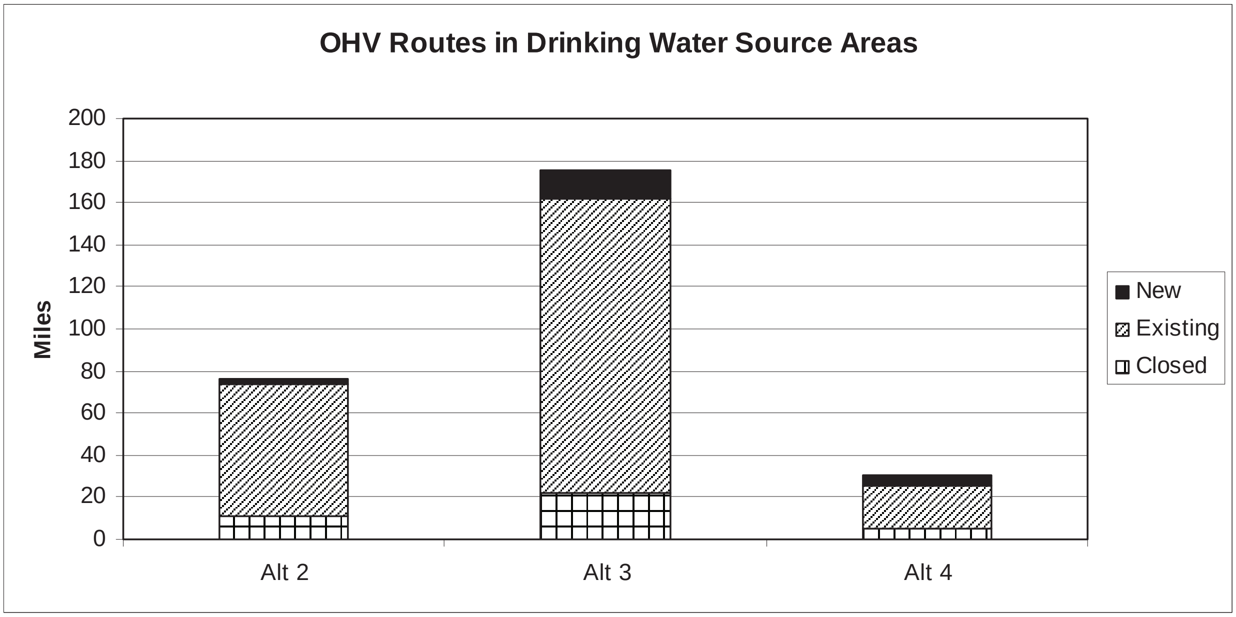
Figure 3-4. Native surface crossings by OHV system for Alternative 2.



Direct and Indirect Effects – Drinking Water

As described in the Affected Environment section, several drinking water source areas are located within some of the proposed OHV locations. The following figure displays the miles of OHV trails in drinking water source areas by alternative.

Figure 3-5. OHV roads and trails in drinking water source areas by action alternative.



Most of the OHV roads and trails are located in the City of Estacada's source area in the Clackamas River Watershed. Eighty-one percent of the 62 miles of OHV roads and trails are located in the City of Estacada's source area in Alternative 2.

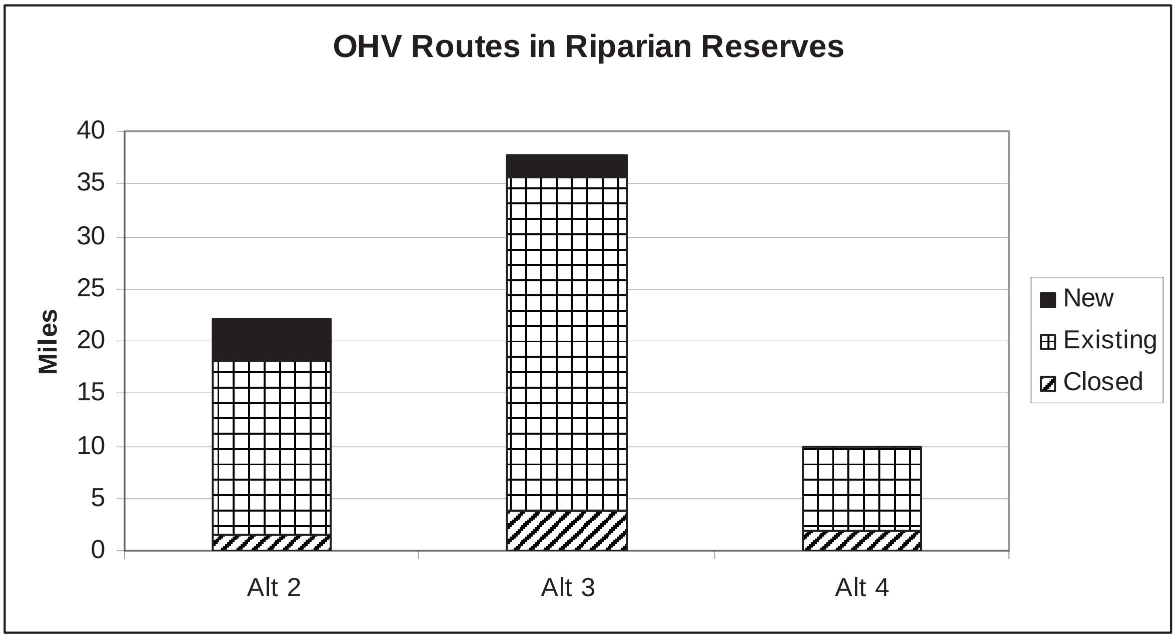
Table 3-51. Miles of OHV roads and trails within drinking water source areas for Alternatives 1 and 2.

Drinking Water Source Areas	OHV Location	Alternative 1		Alternative 2		
		Roads (mi)	Trails (mi)	Roads (mi)	Trails-Existing (mi)	Trails-New (mi)
City of Estacada	LaDee Flats, Peavine	979.9	10.4	53.3	0	1.6
The Dalles (Water Treatment)	Gibson Prairie	8.5	0.5	0	0.9	0
USFS Ripplebrook RS/ Timberlake Job Corps	LaDee Flats, Peavine	290.8	0	8.6	0	1.2
All Other Drinking Water Source Areas		97.0	0	0.2	0	0.04
Grand Total		**1,376**	**10.9**	**62.1**	**0.9**	**2.8**

Direct and Indirect Effects – Riparian Areas, Riparian Reserves and Key Watersheds

As described in the Affected Environment section, riparian areas provide numerous benefits to water quality including woody material, stream temperature protection, bank stabilization and buffering ability to protect water quality. The Northwest Forest Plan established Riparian Reserves in recognition of these benefits. Riparian Reserves are established around streams, wetlands, ponds, lakes and unstable areas. In Alternative 2, some benefits to water quality would be derived from road decommissioning while there would be some additional disturbance to Riparian Reserves. This relationship is displayed in the figure below.

Figure 3-6. OHV roads and trails in Riparian Reserves for the action alternatives.



In Alternative 2, some benefits to water quality would be derived from road decommissioning while there would be some additional disturbance to Riparian Reserves. A table comparing miles of OHV roads and trails in Riparian Reserves for Alternative 1 and 2 is shown below.

Table 3-52. Miles of OHV roads and trails within Riparian Reserves for Alternatives 1 and 2.

5th Field Watershed	OHV Location	Alternative 1		Alternative 2		
		Roads (mi)	Trails (mi)	Roads (mi)	Trails-Existing (mi)	Trails-New (mi)
Beaver Creek	McCubbins Gulch	1.2	0.2	0.3	0.2	0
East Fork Hood River	Gibson Prairie, Bear Creek	25.8	0	0	0	2.4
Middle Clackamas River	LaDee Flats	69.9	0	4.2	0	0
Middle Columbia/Mill Creek	Gibson Prairie	2.8	0	1.1	0	0.1
Middle Deschutes River	McCubbins Gulch	2.6	1.6	0.5	1.6	0.05
Oak Grove Fork Clackamas River	Peavine, LaDee Flats	62.3	0	0.7	0	0.2
Upper Clackamas River	Peavine	64.5	0.3	0.9	0	0
Warm Springs River	Peavine	5.6	0	2.2	0	0.5
White River	McCubbins Gulch, Rock Creek	48.3	2.2	2.5	2.1	0.8
All Other 5th Field Watersheds		169.5	0.1	0	0	0
Grand Total		**452.6**	**4.3**	**12.5**	**3.9**	**4.1**

Alternative 2 proposes to decommission approximately 1.46 miles of road in Riparian Reserves, but construct approximately 4.12 miles of new trail. This would be approximately 8.8 acres of decommissioning and four acres of new construction when converted to acres (assumes six acres per mile of road and about one acre per mile of quad trail).

As stated in the Affected Environment section, the Northwest Forest Plan utilizes Key Watersheds as one of the four components of the Aquatic Conservation Strategy. Key Watersheds are defined as "A system of large refugia comprising watersheds that are crucial to at-risk fish species and stocks and provide high quality water" (NWFP ROD, B-12). Alternative 2 doesn't propose any new road construction in Key Watersheds and would decommission 0.49 miles of road within the White River Key Watershed.

Direct and Indirect Impacts – Staging Areas

The table below shows the staging areas proposed in Alternative 2.

Table 3-53. Staging area information for Alternative 2.

Geographic Location Name	Staging Area Description	Size (Acres)	In Riparian Reserve?
Bear Creek	Storage Pit, Road 16	0.4	No
	Storage Pit, Road 1610	0.4	No
Gibson Prairie	Range Allotment Loading Area	0.7	No
LaDee Flats	No Whisky Timber Sale Landing	1.0	No
McCubbins Gulch	McCubbins Campground	8.0	Yes
Peavine	Warm Springs Quarry	5.2	No
Rock Creek	Post Point Quarry	4.1	No

As described above, the staging areas are on previously disturbed ground, such as quarries, borrow pits or log landings, and have a low potential for erosion due to their flat nature and lack of erodible soil. One of the proposed staging areas is located within Riparian Reserves. The McCubbins Campground is within the Riparian Reserve along McCubbins Gulch. This area is already disturbed from OHV and other use and is currently lacking groundcover due to high intensity of use. Surface erosion was observed in places during a 2008 field visit. Implementation of PDC S-3, WR-2, WR-1, WR-6 and WR-7 should reduce the likelihood of erosion and resulting sedimentation during staging area construction and use by requiring design and construction measures that minimize erosion, sedimentation, and hazardous materials from leaching into surface waters. The PDC also give special recognition to and have requirements for activities within Riparian Reserves. Burroughs and King (1989) reported that measures such as erosion control blankets alone could reduce sediment production by 80 to 90 percent. This in conjunction with other measures such as minimizing the amount of ground disturbance decrease the chance of short-term direct and indirect sediment production.

Direct and Indirect Effects – Chemicals and Bacteriological Contamination

Chemicals, such as hydrocarbons, have the potential to be introduced into adjacent surface and groundwater through vehicle leakage, incidental spills while refueling vehicles and indirectly through dust and flushing of residue from vegetation. A thorough discussion about the potential for water quality impairment due to chemicals from OHV use is included in the Fisheries section. This analysis concluded that it would be unlikely that a direct spill of hydrocarbons into surface water would occur and the chance of indirect introduction of these pollutants is low as well based on pertinent research cited in the Fisheries section. PDC WR-1 and WR-2 would reduce the likelihood of direct and indirect introduction of chemical pollutants from OHV activities into surface waters. The chance of indirect airborne introduction of chemicals would be related to the amount on OHV stream crossings and use levels at these crossings since dust settling out near a stream would have the greatest chance of indirectly washing into surface water. The chance of this being a significant contributor to water pollution is not well known at this time.

As described above, there is a potential for bacteriological water contamination from intensive recreation use. A discussion of this issue is included in the Fisheries section and according to this analysis is expected to low due to the installation of sanitation facilities.

Summary of Direct and Indirect Effects for Alternative 2

Implementation of Alternative 2 would result in a large reduction in the amount of OHV roads and trails compared to Alternative 1. OHV use would focus down to six proposed OHV locations. The amount of potential indirect and direct erosion and resulting sedimentation would increase in those six areas as OHV use increases. The project design criteria for OHV roads, trails, one area, and staging areas are expected to substantially reduce the potential for erosion and sedimentation. Benefits to water quality would be realized by road decommissioning after some initial potential for short-term direct and indirect sedimentation. The table below is a summary of the changes to water quality indicators between Alternatives 1 and 2. In addition, some of the restoration work that benefits water quality is summarized as well in Table 3-54.

Table 3-54. Summary of water quality indicators for Alternative 2.

Water Quality Effects Measure	Alternative 2	Change from Alternative 1	Areas of Greatest Reduction (5th Field Watersheds within OHV Locations)	OHV Location Summary
Miles of OHV roads and trails within 100 feet of a stream	9.2 miles	Reduced by 194 miles or 95%	Middle Clackamas River, White River, Upper Clackamas River, Oak Grove Fork Clackamas River	Bear Creek: 0.8 mi Gibson Prairie: 0.3 mi LaDee Flats: 1.2 mi McCubbins Gulch: 3.7 mi Peavine: 0.9 mi Rock Creek: 0.9 mi
Number of stream crossings	102	Reduced by 3,302 crossings or 97%	Middle Clackamas River, White River, Upper Clackamas River, Oak Grove Fork Clackamas River	Bear Creek: 13 crossings Gibson Prairie: 3 crossings LaDee Flats: 19 crossings McCubbins: 34 crossings Peavine: 23 crossings Rock Creek: 10 crossings
Miles of OHV roads and trails in drinking water source areas	65.8 miles	Reduced by 1,313 miles or 95%	City of Estacada, USFS Ripplebrook RS/ Timberlake Job Corps	Gibson Prairie: 0.9 mi LaDee Flats: 38.9 mi Peavine: 25.8 mi
Miles of OHV roads and trails within Riparian Reserves	20.5 miles	Reduced by 436 miles or 96%	East Fork Hood River, Middle Clackamas River, White River Upper Clackamas River, Oak Grove Fork Clackamas River	Bear Creek: 2.43 mi Gibson Prairie: 1.28 mi LaDee Flats: 4.24 mi McCubbins: 6.11 mi Peavine: 4.48 mi Rock Creek: 1.98 mi
Number of Staging Areas	7	n/a	n/a	n/a

Table 3-55. Summary of aquatic restoration activities for Alternative 2.

Aquatic Restoration Measure	Alternative 2	Areas of Greatest Restoration
Miles of Decommissioned Roads Within 100 feet of a Stream	0.6 miles	Beaver Creek, Middle Clackamas River, Warm Springs River, White River
Number of Stream Crossings Restored	7	Middle Clackamas River, Warm Springs River
Miles of Decommissioned Roads in Drinking Water Source Areas	10.9 miles	City of Estacada
Miles of Decommissioned Roads in Key Watersheds	0.5 miles	White River Key Watershed

Alternative 3

Direct and Indirect Effects – Water Quality (Soil Disturbance, Turbidity and Fine Sediment)

Indirect and direct sediment effects are similar to those described for Alternative 2 but they differ in location and magnitude. Alternative 3 proposes more OHV roads and trails near surface water, in riparian areas and in drinking water source areas than Alternatives 2 and 4, but the disturbance is still greatly reduced from Alternative 1. Important factors relating to erosion and sedimentation have already been discussed above and in the Soils and Fisheries sections. The following tables display locations and magnitude of disturbances that have the potential to cause direct and indirect short- and long-term erosion and sedimentation. These are the same general tables displayed for Alternative 2, but compare Alternative 3 with Alternative 1. It should be noted that the 394,886 acres of land allocation that does not prohibit cross-country OHV travel is not part of the tables for Alternative 1. It is expected that use of this land for cross-country travel has a large potential for erosion and sediment introduction due to travel in and around aquatic areas.

Alternative 3 proposes to decommission 1.53 miles of road within 100 feet of streams. The decommissioning is fairly evenly spread out between the Beaver Creek, Middle Clackamas River, Middle Deschutes River, Oak Grove Fork Clackamas River, Upper Clackamas River and White River 5th field watersheds. This alternative would use or convert 13.84 miles of existing roads or trails and construct 1.11 miles of new trail within 100 feet of streams. The table below shows the length of OHV roads and trails within 100 feet of a stream by proposed treatment for the different 5th field watersheds. This table compares Alternative 1 with Alternative 3.

Table 3-56. Miles of OHV roads and trails within 100 feet of streams by 5th field watershed for Alternatives 1 and 3.

5th Field Watershed	OHV Location	Alternative 1		Alternative 3		
		Roads (mi)	Trails (mi)	Roads (mi)	Trails-Existing (mi)	Trails-New (mi)
Beaver Creek	McCubbins Gulch	1.1	0.2	0.1	0	0
East Fork Hood River	Bear Creek, Gibson Prairie	9.1	0	0.3	0	0.2
Collawash River	Graham Pass	28.6	0.1	0.8	0.1	0
Middle Clackamas River	LaDee Flats	30.7	0	1.2	0	0
Middle Columbia/Mill Creek	Gibson Prairie	0.7	0	0	0	0
Middle Deschutes River	McCubbins Gulch	2.1	1.0	0.2	0.8	0
Oak Grove Fork Clackamas River	Peavine, LaDee Flats	26.9	0	0.70	0	0.2
Tygh Creek	Rock Creek	6.1	0	0.1	0	0
Upper Clackamas River	Graham Pass, Peavine	28.1	0.3	5.9	0.3	0.4

Table 3-56. (continued)

5th Field Watershed	OHV Location	Alternative 1		Alternative 3		
		Roads (mi)	Trails (mi)	Roads (mi)	Trails-Existing (mi)	Trails-New (mi)
West Fork Hood River	Bear Creek, Mt. Defiance	11.7	0	0.1	0	0
White River	McCubbins Gulch, Rock Creek	24.2	1.4	2.3	1.2	0.3
All Other 5th Field Watersheds		31.0	0	0	0	0
Grand Total		**200.3**	**2.9**	**11.6**	**2.3**	**1.1**

The majority of new trail construction within 100 feet of streams is proposed in the Bear Creek, Peavine and Rock Creek OHV locations. The Bear Creek trail segments are mostly on tributaries to Tony Creek while the Peavine trails cross numerous tributaries to the Clackamas River and Oak Grove Fork Clackamas River. The Rock Creek trails cross Souva Creek, Gate Creek and a number of other tributary streams.

Alternative 3 proposes to decommission 21 stream crossings, the majority of which are in the Upper Clackamas River and White River 5th field watersheds. Thirteen of the crossings are on intermittent streams while eight are on perennial streams. As described above, this decommissioning would cause short-term direct and indirect sedimentation to the adjacent stream, but would provide a long-term reduction in erosion and sedimentation once these crossings revegetate and stabilize. Alternative 3 would use 145 crossings on existing roads or trails and construct 16 new trail crossings on streams. The new trail crossings are evenly distributed between Bear Creek, McCubbins Gulch and Peavine OHV systems. The table below shows stream crossings by OHV location and proposed treatment.

Table 3-57. Number of OHV road and trail stream crossings by 5th field watershed for Alternatives 1 and 3.

5th Field Watershed	OHV Location	Alternative 1		Alternative 3		
		Road Crossings (number of crossings)	Trail Crossings (number of crossings)	Road Crossings (number of crossings)	Trail Crossings (number of crossings)	New Trail Crossings (number of crossings)
Beaver Creek	McCubbins Gulch	13	2	2	0	0
East Fork Hood River	Bear Creek, Gibson Prairie	180	0	4	0	5
Middle Clackamas River	LaDee Flats	548	0	18	0	0
Middle Columbia/ Mill Creek	Gibson Prairie	30	0	0	0	0
Middle Deschutes River	McCubbins Gulch	22	10	1	9	0
Oak Grove Fork Clackamas River	Peavine, LaDee Flats	377	0	10	0	1
Tygh Creek	Rock Creek	75	0	2	0	0
Upper Clackamas River	Graham Pass, Peavine	461	4	49	4	5
White River	McCubbins, Rock Creek	436	12	36	10	5
All Other 5th Field Watersheds		1,234	0	0	0	0
Grand Total		**3,376**	**28**	**122**	**23**	**16**

As discussed in Alternative 2, native surface road and trail stream crossings were analyzed for erosion potential using the soil resource inventory. Native surface roads have higher erosion potentials than gravel surfaced roads. All native surface road and stream crossings were classified as having a high, moderate or low relative erosion potential, based on the erosion potential of the underlying soil type. Alternative 3 has the highest number of native surface crossing between Alternatives 2, 3 and 4. Fourteen native surface stream crossings are on high surface erosion potential soils, 52 crossings on moderate surface erosion potential soils and seven native surface crossings on low surface erosion potential soils. The majority of the erosive crossings are on the McCubbins and Peavine locations. Crossings in the McCubbins location flow into the White River and McCubbins Gulch stream systems while the Peavine crossings are located on tributaries to the Clackamas River such as Campbell Creek and other unnamed streams.

Direct and Indirect Effects – Staging Areas

The staging areas for Alternative 3 are presented in the table below.

Table 3-58. Staging area information for Alternative 3.

OHV Location Name	Staging Area Location	Size (Acres)	In Riparian Reserve?
Bear Creek	Storage Pit, Road 16	0.4	No
	Storage Pit, Road 1610	0.4	No
Gibson Prairie	No Staging Area		No
Graham Pass	Lowe Creek Pit	1.4	No
LaDee Flats	No Whisky Timber Sale Landing	1.0	No
	Round Wolf Pit	2.2	No
McCubbins Gulch	McCubbins Campground	8.0	Yes
	McCubbins Day-Use Site	0.8	No
	Timber Sale Landing	1.1	No
Peavine	Devil's Ridge Quarry	3.2	No
Rock Creek	Post Point Quarry	4.1	No

As described in Alternative 2, one of the eleven staging areas is located within Riparian Reserves. Implementation of PDC S-3, WR-2, WR-1, WR-6 and WR-7 should reduce the likelihood of erosion and resulting sedimentation during staging area construction and use by requiring design and construction measures that "minimize erosion, sedimentation, and hazardous materials from leaching into surface waters". The PDC also give special recognition to and have requirements for activities within Riparian Reserves. Burroughs and King (1989) reported that measures such as erosion control blankets alone could reduce sediment production by 80 to 90 percent. Implementation of erosion control measures in conjunction with other measures such as minimizing the amount of ground disturbance and locating areas in stable landforms away from surface water, substantially decrease the chance of short-term and long-term direct and indirect sediment production from staging areas.

Direct and Indirect Effects – Drinking Water

As described in the Affected Environment section, several drinking water source areas are located within some of the proposed OHV locations. The following table displays the miles of OHV roads and trails in drinking water source areas for Alternatives 1 and 3.

Table 3-59. Miles of OHV roads and trails within in drinking water source areas for Alternative 1 and 3.

Drinking Water Source Areas	OHV Location	Alternative 1		Alternative 3		
		Roads (mi)	Trails (mi)	Roads (mi)	Trails-Existing (mi)	Trails-New (mi)
City of Estacada	LaDee Flats, Peavine	979.9	10.4	130.5	10.5	12.5
USFS Ripplebrook RS/Timberlake Job Corps	LaDee Flats, Peavine	290.8	0	12.6	0.1	1.5
Oak Grove Water Company	Mt. Defiance	3.7	0	2.4	0	0
All Other Drinking Water Source Areas		101.8	0.5	0	0	0
Grand Total		**1,376**	**10.9**	**145.4**	**10.6**	**14.0**

Alternative 3 proposes to decommission almost 22 miles of road in drinking water source areas. Approximately 13.7 miles are proposed for decommissioning in the City of Estacada's source area while 8.3 miles are proposed in the USFS Ripplebrook RS/Timberlake Job Corps source area. This decommissioning would cause short-term direct and indirect sedimentation to adjacent surface water, but would provide a long-term reduction in erosion and sedimentation once these crossings road systems stabilize. Most of the OHV locations proposed for use are in the City of Estacada's Source Area in the Clackamas River Watershed. These trails are associated with the LaDee and Peavine locations.

Direct and Indirect Effects – Riparian Areas, Riparian Reserves and Key Watersheds

As described above, riparian areas and Riparian Reserves provide numerous benefits to water quality including woody material, stream temperature protection, bank stabilization and buffering ability to protect water quality. In Alternative 3, some benefits to water quality would be derived from road decommissioning while there would be some additional disturbance to Riparian Reserves. A table comparing miles of OHV roads and trails in Riparian Reserves for Alternative 1 and 3 is shown below.

Table 3-60. Miles of OHV roads and trails within Riparian Reserves for Alternatives 1 and 3.

5th Field Watershed	OHV Location	Alternative 1		Alternative 3		
		Roads (mi)	Trails (mi)	Roads (mi)	Trails-Existing (mi)	Trails-New (mi)
Beaver Creek	McCubbins Gulch	1.2	0.2	0.1	0	0
Collawash River	Graham Pass	71.9	0.1	1.8	0.1	0
East Fork Hood River	Bear Creek, Gibson Prairie	25.8	0	0.7	0	0.4
Hood River	Gibson Prairie	5.8	0	0.7	0	0
Middle Clackamas River	LaDee Flats	69.9	0	4.2	0	0
Middle Deschutes River	McCubbins Gulch	2.6	1.6	0.2	1.6	0.1
Mosier Creek	Gibson Prairie	0.6	0	0.2	0	0

Table 3-60. (continued)

5th Field Watershed	OHV Location	Alternative 1		Alternative 3		
		Roads (mi)	Trails (mi)	Roads (mi)	Trails-Existing (mi)	Trails-New (mi)
Oak Grove Fork Clackamas River	LaDee Flats, Peavine	62.3	0	1.4	0	0.2
Tygh Creek	Rock Creek	11.2	0	0.3	0	0
Upper Clackamas River	Peavine, Graham Pass	64.5	0.3	13.2	0.3	0.6
West Fork Hood River	Bear Creek, Mt. Defiance	25.8	0	0.2	0	0
White River	McCubbins, Rock Creek	48.3	2.2	4.9	1.9	0.8
All Other 5th Field Watersheds		62.7	0	0	0	0
Grand Total		**452.6**	**4.3**	**28.0**	**3.9**	**2.1**

Alternative 3 proposes to decommission approximately 3.73 miles of road in Riparian Reserves but construct approximately 2.08 miles of new trail. This would be approximately 22.4 acres of decommissioning in Riparian Reserves and two acres of new construction when converted to acres (assumes six acres per mile of road and about one acre per mile of quad trail). Decommissioning in Riparian Reserves is spread throughout most of the Alternative 3 5th field watersheds, but the highest amount is in the proposed LaDee Flats location and the Middle Clackamas River 5th field watershed.

As stated in the Affected Environment section, the Northwest Forest Plan utilizes Key Watersheds as one of the four components of the Aquatic Conservation Strategy. Key Watersheds are defined as "A system of large refugia comprising watersheds that are crucial to at-risk fish species and stocks and provide high quality water" (NWFP ROD, B-12). Alternative 3 doesn't propose any new road construction in Key Watersheds and would decommission 9 miles of road within the White River Key Watershed.

Direct and Indirect Effects – Chemical and Bacteriological Contamination

Chemicals, such as hydrocarbons, have the potential to be introduced into adjacent surface and groundwater through vehicle leakage, incidental spills while refueling vehicles and indirectly through dust and flushing of residue from vegetation. A thorough discussion about the potential for water quality impairment due to chemicals from OHV use is included in the Fisheries section. This analysis concluded that it would be unlikely that a direct spill of hydrocarbons into surface water would occur and the chance of indirect introduction of these pollutants is low as well based on pertinent research. The chance of indirect airborne introduction of chemicals would be related to the amount on OHV stream crossings and use levels at these crossings since dust settling out near a stream would have the greatest chance of indirectly washing into surface water. The chance of this being a significant contributor to water pollution is not well known at this time.

As described above, there is a potential for bacteriological water contamination from intensive recreation use. A discussion of this issue is included in the Fisheries section and according to this analysis is expected to low due to the installation of sanitation facilities.

Summary of Direct and Indirect Effects for Alternative 3

Implementation of Alternative 3 would result in a large reduction in the amount of OHV roads and trails compared to Alternative 1. OHV use would focus down to eight proposed OHV locations, all of which currently contain some level of OHV use. The amount of potential indirect and direct erosion and resulting sedimentation would increase in those eight areas as OHV use increases. Project design criteria for OHV roads, trails, one area, and staging areas are expected to substantially reduce the potential for erosion and sedimentation. Benefits to water quality would be realized by road decommissioning after some initial potential for short-term direct and indirect sedimentation. The table below is a summary of the changes to water quality indicators between Alternative 1 and 3. In addition, some of the restoration work that benefits water quality is summarized in Table 3-61.

Table 3-61. Summary of water quality indicators for Alternative 3.

Water Quality Effects Measure	Alternative 3	Change from Alternative 1	Areas of Greatest Reduction (5th Field Watersheds within OHV Locations)	OHV Location Summary
Miles of OHV roads and trails within 100 feet of a stream	15.0 miles	Reduced by 188 miles or 93%	Collawash River, Upper Clackamas River, Oak Grove Fork Clackamas River, Middle Clackamas River	Bear Creek: 0.5 mi Gibson Prairie: 0.01 mi Graham Pass: 5.1 mi LaDee Flats: 1.2 mi McCubbins Gulch: 3.2 mi Peavine: 3.0 mi Rock Creek: 1.8 mi
Number of stream cross-ings	161	Reduced by 3,423 crossings or 95%	Middle Clackamas River, White River, Upper Clackamas River, Oak Grove Fork Clackamas River	Bear Creek: 9 crossings Graham Pass: 34 crossings LaDee Flats: 18 crossings McCubbins: 36 crossings Peavine: 35 crossings Rock Creek: 29 crossings
Miles of OHV roads and trails in drinking water source areas	170	Reduced by 1,206 miles or 88%	City of Estacada, USFS Ripplebrook RS/ Timberlake Job Corps	Graham Pass: 63.2 mi LaDee Flats: 46.9 mi Mt. Defiance: 2.42 mi Peavine: 65.5 mi
Miles of OHV routes within riparian reserves	33.9	Reduced by 423 miles or 93%	Collawash River, White River, Oak Grove Fork Clackamas River, Middle Clackamas River	Bear Creek: 1.04 mi Gibson Prairie: 0.92 mi Graham Pass: 11.06 mi LaDee Flats: 4.24 mi McCubbins: 5.98 mi Mt. Defiance: 0.16 mi Peavine: 6.59 mi Rock Creek: 3.96 mi
Number of Staging Areas	11	n/a	n/a	n/a

Table 3-62. Summary of aquatic restoration activities for Alternative 3.

Aquatic Restoration Measure	Alternative 3	Areas of Greatest Restoration
Miles of decommissioned roads within 100 feet of a stream	1.5 miles	Beaver Creek, Middle Clackamas River, Oak Grove Fork Clackamas River, Warm Springs River, White River
Number of stream crossings restored	21	Upper Clackamas River, White River
Miles of decommissioned roads in drinking water source areas	22.0 miles	City of Estacada, USFS Ripplebrook RS/Timber-lake JCC
Miles of decommissioned roads in key water-sheds	9	White River Key Watershed

Alternative 4

Direct and Indirect Effects – Water Quality (Soil Disturbance, Turbidity and Fine Sediment)

Indirect and direct sediment effects are similar to those described for Alternative 2, but they differ in location and magnitude. Alternative 4 proposes less miles of OHV roads and trails near surface water, in riparian areas and in drinking water source areas than Alternatives 2 and 3, and the disturbance area is greatly reduced from Alternative 1. Important factors relating to erosion and sedimentation have already been discussed above and in the Soils and Fisheries sections. The following tables display locations and magnitude of disturbances that have the potential to cause direct and indirect short- and long-term erosion and sedimentation. These are the same general tables displayed for Alternative 2 and 3, but compare Alternative 4 with Alternative 1. It should be noted that the 394,886 acres of land allocation that does not prohibit cross-country OHV travel is not part of the tables for Alternative 1. It is expected that use of this land for cross-country travel has a large potential for erosion and sediment introduction due to travel in and around aquatic areas.

Alternative 4 proposes to decommission 0.69 miles of road within 100 feet of streams. The decommissioning is fairly evenly spread out between the Beaver Creek, Middle Clackamas River, Middle Deschutes River and White River 5th field watersheds. This alternative would use or convert 3.74 miles of existing roads or trails and construct 0.08 miles of new trail within 100 feet of streams. The table below shows the length of OHV roads and trails within 100 feet of a stream by proposed treatment for the different 5th field watersheds. This table compares Alternative 1 with Alternative 4.

Table 3-63. Miles of OHV roads and trails within 100 feet of streams by 5th field watershed for Alternatives 1 and 4.

5th Field Watershed	OHV Location	Alternative 1		Alternative 4		
		Roads (mi)	Trails (mi)	Roads (mi)	Trails-Existing (mi)	Trails-New (mi)
Beaver Creek	McCubbins Gulch	1.1	0.2	0.1	0	0
Middle Clackamas River	LaDee Flats	30.7	0	0.3	0	0
Middle Deschutes River	McCubbins Gulch	2.1	1.0	0.2	0.8	0
White River	McCubbins, Rock Creek	24.2	1.4	1.2	1.2	0.1
All Other 5thField Watersheds		142.2	0.4	0	0	0
Grand Total		**200.3**	**2.9**	**1.8**	**2.0**	**0.1**

The majority of new trail construction within 100 feet of streams is proposed in the Rock Creek OHV location and includes one trail segment that is within 100 feet of an intermittent tributary to Gate Creek.

Alternative 4 proposes to decommission seven stream crossings, the majority of which are in the Middle Clackamas River and White River 5th field watersheds. Four of the crossings are on intermittent streams while three are on perennial streams. As described above, this decommissioning would cause short-term direct and indirect sedimentation to the adjacent stream, but would provide a long-term reduction in erosion and sedimentation once these crossings revegetate and stabilize. Alternative 4 would use 46 crossings on existing roads or trails and construct no new trail crossings on streams. The table below shows stream crossings by OHV location and proposed treatment.

Table 3-64. Number of OHV road and trail stream crossings by 5th field watershed for Alternative 1 and 4.

5th Field Watershed	OHV Location	Alternative 1		Alternative 4		
		Road Crossings (number of crossings)	Trail Crossings (number of crossings)	Road Crossings (number of crossings)	Trail Crossings (number of crossings)	New Trail Crossings (number of crossings)
Beaver Creek	McCubbins Gulch	13	2	2	0	0
Middle Clackamas River	LaDee Flats	548	0	4	0	0
Middle Deschutes River	McCubbins Gulch	22	10	1	9	0
White River	McCubbins, Rock Creek	436	12	20	10	0
All Other 5th Field Watersheds		2,357	4	0	0	0
Grand Total		**3,376**	**28**	**27**	**19**	**0**

As discussed in Alternative 2, native surface road and trail stream crossings were analyzed for erosion potential using the soil resource inventory. Native surface roads have higher erosion potentials than gravel surfaced roads. All native surface road and stream crossings were classified as having a high, moderate or low relative erosion potential, based on the erosion potential of the underlying soil type. Alternative 4 has the lowest number of native surface crossing between Alternatives 2, 3 and 4. Ten native surface stream crossings are on high surface erosion potential soils, and 20 crossings on moderate surface erosion potential soils. The majority of the erosive crossings are in the McCubbins location. Crossings in the McCubbins location flow into the White River and McCubbins Gulch stream systems.

Direct and Indirect Effects – Staging Areas

The following staging areas are proposed under Alternative 4.

Table 3-65. Staging area information for Alternative 4.

OHV Location Name	Staging Area Location	Size (Acres)	In Riparian Reserve?
LaDee Flats	No Whisky Timber Sale Landing	1.0	No
McCubbins Gulch	McCubbins Campground	8.0	Yes
	McCubbins Day-Use Site	0.8	No
	Timber Sale Landing	1.1	No
Rock Creek	Post Point Quarry	4.1	No

One of the five staging areas is located within Riparian Reserves. Implementation of PDC S-3, WR-2, WR-1, WR-6 and WR-7 should reduce the likelihood of erosion and resulting sedimentation during staging area construction and use by requiring design and construction measures that "minimize erosion, sedimentation, and hazardous materials from leaching into surface waters". The PDCs also give special recognition to and have requirements for activities within Riparian Reserves. Burroughs and King (1989) reported that measures such as erosion control blankets alone could reduce sediment production by 80 to 90 percent. Implementation of erosion control measures in conjunction with other measures such as minimizing the amount of ground disturbance and locating areas in stable landforms away from surface water, substantially decrease the chance of short-term and long-term direct and indirect sediment production from staging areas.

Direct and Indirect Effects – Drinking Water

As described in the Affected Environment section, several drinking water source areas are located within some of the proposed OHV roads and trails. The following table displays the miles of OHV trails in drinking water source areas for Alternatives 1 and 4.

Table 3-66. Miles of OHV roads and trails within in drinking water source area for Alternatives 1 and 4.

Drinking Water Source Areas	OHV Location	Alternative 1		Alternative 4		
		Roads (mi)	Trails (mi)	Roads (mi)	Trails-Existing (mi)	Trails-New (mi)
City of Estacada	LaDee Flats	980	10	20	0	5
All Other Drinking Water Source Areas		396	0.5	0	0	0
Grand Total		**1,376**	**11**	**20**	**0**	**5**

Alternative 4 proposes to decommission 5.12 miles of road in the City of Estacada's drinking water source area. This decommissioning would cause short-term direct and indirect sedimentation to adjacent surface water, but would provide a long-term reduction in erosion and sedimentation once these crossings stabilize.

Direct and Indirect Effects – Riparian Areas, Riparian Reserves and Key Watersheds

As described above, riparian areas and Riparian Reserves provide numerous benefits to water quality including woody material, stream temperature protection, bank stabilization and buffering ability to protect water quality. In Alternative 4, some benefits to water quality would be derived from road decommissioning while there would be some additional disturbance to Riparian Reserves. A table comparing miles of OHV roads and trails in Riparian Reserves for Alternatives 1 and 4 is shown below.

Table 3-67. Miles of OHV roads and trails within Riparian Reserves for Alternatives 1 and 4.

5th Field Watershed	OHV Location	Alternative 1		Alternative 4		
		Roads (mi)	Trails (mi)	Roads (mi)	Trails-Existing (mi)	Trails-New (mi)
Beaver Creek	McCubbins Gulch	1.2	0.2	0.1	0	0
Middle Clackamas River	LaDee Flats	69.9	0	1.7	0	0
Middle Deschutes River	McCubbins Gulch	2.6	1.6	0.2	1.6	0.1
White River	McCubbins, Rock Creek	48.3	2.2	2.4	1.9	0.1
All Other 5th Field Watersheds		330.6	0.4	0	0	0
Grand Total		**452.6**	**4.3**	**4.4**	**3.5**	**0.2**

Alternative 4 proposes to decommission approximately 1.91 miles of road in Riparian Reserves, but construct approximately 0.18 miles of new trail. This would be approximately 11.5 acres of decommissioning in Riparian Reserves and 0.2 acres of new construction when converted to acres (assumes six acres per mile of road and about one acre per mile of quad trail). Decommissioning in Riparian Reserves is spread throughout most of the Alternative 4 5th field watersheds, but the highest amount is in the proposed LaDee Flats OHV system and the Middle Clackamas River 5th field watershed.

As stated in the Affected Environment section, the Northwest Forest Plan utilizes Key Watersheds as one of the four components of the Aquatic Conservation Strategy. Key Watersheds are defined as “A system of large refugia comprising watersheds that are crucial to at-risk fish species and stocks and provide high quality water” (NWFP ROD, B-12). Alternative 4 does not propose any new road construction in Key Watersheds and would decommission 4.04 miles of road within the White River Key Watershed.

Direct and Indirect Effects – Chemical and Bacteriological Contamination

Chemicals, such as hydrocarbons, have the potential to be introduced into adjacent surface and groundwater through vehicle leakage, incidental spills while refueling vehicles and indirectly through dust and flushing of residue from vegetation. A thorough discussion about the potential for water quality impairment due to chemicals from OHV use is included in the Fisheries section. This analysis concluded that it would be unlikely that a direct spill of hydrocarbons into surface water would occur and the chance of indirect introduction of these pollutants is low as well based on pertinent research. The chance of indirect airborne introduction of chemicals would be related to the amount on OHV stream crossings and use levels at these crossings since dust settling out near a stream would have the greatest chance of indirectly washing into surface water. The chance of this being a significant contributor to water pollution is not well known at this time.

As described above, there is a potential for bacteriological water contamination from intensive recreation use. A discussion of this issue is included in the Fisheries section and according to this analysis is expected to low due to the installation of sanitation facilities.

Summary of Direct and Indirect Effects for Alternative 4

Implementation of Alternative 4 would result in a large reduction in the amount of OHV roads and trails compared to Alternative 1. OHV use would focus down to three proposed OHV locations, all of which currently contain some level of OHV use. The amount of potential indirect and direct erosion and resulting sedimentation would increase in those three areas as OHV use increases. The project design criteria for OHV roads, trails, one area, and staging areas are expected to substantially reduce the potential for erosion and sedimentation. Benefits to water quality would be realized by road decommissioning after some initial potential for short-term direct and indirect sedimentation. The table below is a summary of the changes to water quality indicators between Alternatives 1 and 4. In addition, some of the restoration work that benefits water quality is summarized in Table 3-68.

Table 3-68. Summary of water quality indicators for Alternative 4.

Water Quality Effects Measure	Alternative 4	Change from Alternative 1	Areas of Greatest Reduction (5th Field Watersheds within OHV Locations)	OHV Location Summary
Miles of OHV roads and trails within 100 feet of a stream	3.8 miles	Reduced by 199 miles or 98%	Middle Clackamas River, White River	LaDee Flats: 0.3 mi
				McCubbins Gulch: 2.5 mi
				Rock Creek: 1.0 mi
Number of stream cross-ings	46	Reduced by 3,358 crossings or 98%	Middle Clackamas River, White River	LaDee Flats: 2 crossings
				McCubbins: 28 crossings
				Rock Creek: 16 crossings
Miles of OHV roads and trails in drinking water source areas	25 miles	Reduced by 1,351 miles or 98%	City of Estacada	LaDee Flats: 25.09 mi
Miles of OHV roads and trails within Riparian Reserves	8 miles	Reduced by 449 miles or 98%	Middle Clackamas River, White River	LaDee Flats: 1.72 mi
				McCubbins Gulch: 4.27 mi
				Rock Creek: 2.08 mi
Number of staging areas	5	n/a	n/a	n/a

Table 3-69. Summary of aquatic restoration activities for Alternative 4.

Aquatic Restoration Measure	Alternative 4	Areas of Greatest Restoration
Miles of Decommissioned Roads Within 100 feet of a Stream	0.7 miles	Beaver Creek, Middle Clackamas River, Middle Deschutes River, White River
Number of Stream Crossings Restored	7	Middle Clackamas River, White River
Miles of Decommissioned Roads in Drinking Water Source Areas	5.1 miles	City of Estacada
Miles of Decommissioned Roads in Key Watersheds	4.0 miles	White River Key Watershed

Cumulative Effects for Alternatives 2, 3 and 4

The table below provides a qualitative summary of potential cumulative watershed effects. It shows existing and potential projects, effects from those projects that may result in cumulative effects with this OHV project, whether these projects overlap in time and space and an assessment if a measurable cumulative effect is expected. Findings of this summary are supported by the analysis above which utilizes pertinent research, mitigation measures and design criteria and applicable management standards and guidelines. Alternatives 2, 3 and 4 have been combined together due to the expectation of similar potential for cumulative effects for these three alternatives.

Table 3-70. Summary of cumulative effects for Alternatives 2, 3, and 4.

Project	Potential Effects	Overlap in		Measurable Cumulative Effect?	Extent, Detectable?
		Time	Space		
Existing Forest Service Timber Harvest Units	Suspended Sediment	No	Yes	No	Projects are completed. No remaining sediment effects due to project design criteria implementation on the original projects and natural recovery.
Forest Service Vegetation Treatment Activities Planned or Underway (The Dalles Watershed Fuelbreak, North Fork Mill Restoration Project, Sportsman's Park Hazardous Fuels Reduction, No Whisky Plantation thinning, Upper Clackamas Plantation Thinning, Cascade Crest Fuel Break Project, Pre-commercial treatments)	Suspended Sediment	Yes	Yes	Yes	There may be an overlap in timing and location of these projects with this OHV project; these projects have a chance of some short-term introduction of fine sediment that may mix with fine sediment from the OHV project. Some of the high risk areas would be in Neal Creek and West Fork Neal Creek due to North Fork Mill Restoration Project culvert replacements, road reconstruction on the 1700 road, OHV use on Hood River County lands, existing Long Prairie Grazing Allotment damage and timber harvest on private lands. The highest risk is associated with Alternative 2, a low risk in Alternative 3, and no risk in Alternative 4. Other listed projects have a low risk of cumulative effects due to implementation of project design criteria that minimize erosion and sediment input.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to project design criteria implementation and conformance with existing standards and guidelines on both the existing projects and this OHV project

Table 3-70. (continued)

Project	Potential Effects	Overlap in Time	Overlap in Space	Measurable Cumulative Effect?	Extent, Detectable?
Private Land Activities (SDS Timber Harvest, City of The Dalles Timber Harvest, Hood River County Trails Project)	Suspended Sediment	Yes	Yes	Yes	Some projects are completed so there are no remaining sediment effects due to natural recovery. Other ongoing projects on adjacent private land such as road maintenance and vegetation manipulation have a chance of some short-term introduction of fine sediment that may mix with minor fine sediment from the Mt. Hood National Forest OHV project. Some of the high risk areas would be in Neal Creek and W. Fork Neal Creek due to N. Fork Mill Restoration Project culvert replacements, road reconstruction on the 1700 road, OHV use on Hood River County lands, existing Long Prairie Grazing Allotment damage and timber harvest on private lands. N. Fork Mill Creek due to N. Fork Mill Restoration Project culvert replacements. The highest risk is associated with Alternative 2, a low risk in Alternative 3 and no risk in Alternative 4.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to mitigation measures and design criteria implementation and conformance with existing standards and guidelines on both the existing projects and the Mt. Hood National Forest OHV project.
Misc. Tree Salvage (Hazard Trees)	Suspended Sediment	Yes	Yes	Not Measurable	There may be an overlap in timing of this project with the Mt. Hood National Forest OHV project; any minor suspended sediment would not be measurable due to implementation of mitigation measures and design criteria and conformance with existing standards and guidelines in both projects.
Long Prairie Grazing Allotment	Suspended Sediment	Yes	Yes	Yes	Current damage in riparian areas from grazing has a chance of some short-term introduction of fine sediment that may mix with minor fine sediment from the Mt. Hood National Forest OHV project. The highest risk of this would be in W. Fork Neal Creek due to the culvert replacement projects, road reconstruction on the 1700 road, Long Prairie Grazing allotment, OHV use on Hood River County lands and timber harvest on private lands. Long-term restoration of a more natural sediment regime is likely with recovery due to mitigation measures and design criteria in the Long Prairie Grazing Allotment project coupled with road decommissioning, culvert removal/replacement and road closures associated with the N. Fork Mill Restoration Project.

Table 3-70. (continued)

Project	Potential Effects	Overlap in Time	Overlap in Space	Measurable Cumulative Effect?	Extent, Detectable?
Ongoing road and trail maintenance	Suspended Sediment	Yes	Yes	Yes	There may be an overlap in timing and location of these projects with this OHV project; these projects have a chance of some short-term introduction of fine sediment that may mix with fine sediment from the OHV project. Some of the high risk areas would be in Neal Creek and West Fork Neal Creek due to North Fork Mill Restoration Project culvert replacements, road reconstruction on the 1700 road, OHV use on Hood River County lands, existing Long Prairie Grazing Allotment damage and timber harvest on private lands. Other areas of potential concern include McCubbins Gulch and Cabin Creek in the Peavine location due to the number of OHV stream crossings and native surface roads.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to project design criteria implementation and conformance with existing standards and guidelines on both the existing projects and this OHV project.
Invasive Plant Treatments	Suspended Sediment	Yes	Yes	Not Measurable	There may be an overlap in timing of invasive plant treatments with this OHV project; any minor suspended sediment would not be measurable due to implementation project design criteria and conformance with existing standards and guidelines in both projects.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to project design criteria implementation and conformance with existing standards and guidelines on both the existing projects and this OHV project.
Past Aquatic Restoration Projects	Suspended Sediment	No	Yes	Not Measurable	There may be an overlap in timing of these project effects with this OHV project. Any minor suspended sediment may slightly slow the recovery resulting from restoration project implementation, but this would not be measurable due to implementation of project design criteria and conformance with existing standards and guidelines in both projects.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to project design criteria implementation and conformance with existing standards and guidelines on both the existing projects and this OHV project.

Table 3-70. (continued)

Project	Potential Effects	Overlap in Time	Overlap in Space	Measurable Cumulative Effect?	Extent, Detectable?
Clackamas Road Decommissioning	Suspended Sediment	Yes	Yes	No	There is a small spatial and temporal overlap of effects of the project with this OHV project. Any minor suspended sediment may slightly slow the recovery resulting from restoration project implementation but this would not be measurable due to implementation of design criteria and conformance with existing standards and guidelines in all projects on the Forest.
Future Aquatic Restoration Projects	Suspended Sediment	Yes	Yes	Not Measurable	There may be a spatial overlap of these project effects with the OHV project. Any minor suspended sediment may slightly slow the recovery resulting from restoration project implementation but this would not be measurable due to implementation of project design criteria and conformance with existing standards and guidelines in all projects on the Forest.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to project design criteria implementation and conformance with existing standards and guidelines on both the existing projects and this OHV project

Summary of Cumulative Effects for Alternatives 2, 3, and 4

Sediment: Measurable cumulative effects are possible as a result of sediment introduction from this project. The risk depends on the timing of this project and other projects listed in the table above. If these projects are spaced closely together in time (within three years of each other), there is a higher chance that there would be a measurable cumulative effect than if they are implemented over a longer period of time. This is due to the dispersal of sediment throughout the stream system as time goes on. The highest risk of a cumulative sediment effect is in the Neal Creek and West Fork Neal Creek due to the amount of activity confined in a fairly small area. The highest risk portions of this project are the culvert replacement and removals since they require work in the actual stream channel. The highest risk is associated with Alternative 2, a low risk with Alternative 3, and no risk in Alternative 4.
OHV Related Chemicals: There would be little to no chance for cumulative effects related to OHV derived chemicals due to the implementation of PDC that minimize the chance of introducing these chemicals to surface water.

3.3.3. Incomplete and Unavailable Information

Limitations of the Forest Service Watershed Erosion Prediction Project (WEPP) Model can be found on the web site http://forest.moscowfsl.wsu.edu/fswepp. The total current OHV use is not complete and well documented. It is suspected that many user-created trails have not been inventoried.

3.4. Fisheries

This analysis is based on the information found in the Fisheries Specialist Report for this project, which is in the project record located at the Forest Headquarters Office in Sandy, Oregon.

3.4.1. Existing Condition

The following section describes existing distribution and status of native and/or culturally important fish species as well as four aquatic snails and one caddisfly species on the Forest. A description of habitat conditions, limited to those habitat parameters that could be affected by actions proposed in this EIS, follows the aquatic species discussion. Included is a description of designated critical habitat and essential fish habitat. Most of the information regarding fish distribution and habitat conditions was taken from existing Oregon Department of Fish and Wildlife and/or US Forest Service survey information, much of which is unpublished data.

The following discussion covers the entire Forest because the range of alternatives encompasses most of the Forest land base. Exceptions include wilderness areas and a few other land allocations. However, fish and aquatic macroinvertebrate distribution in relation to proposed OHV locations is summarized at the end of this section to better describe effects to Endangered Species Act (ESA) and Region 6 Regional Forester's Special Status species.

Aquatic Organisms

The Forest uses salmonids (salmon, trout and char) as management indicator species for aquatic habitats. Due to their value as game fish and their sensitivity to habitat changes and water quality degradation, salmonids are used to monitor trends within Forest streams and lakes. Although other fish species may be present (e.g., lamprey, sculpins and dace), their population status and trends are unknown. Since more information exists on salmonids, this group serves as a more optimal choice for monitoring aquatic environments.

The Forest is home to several populations of salmon, steelhead, and resident trout. There are over 1,600 miles of fish-bearing streams on the Forest, with approximately 300 miles supporting anadromous populations of salmon and steelhead. Most salmonids that reside in Forest streams are an important cultural, economic and recreational resource. A number of species are listed as threatened under the ESA, or are Region 6 Regional Forester Special Status Species (Table 3-70).

Salmonids listed under the ESA are grouped by distinct population segment (DPS) or evolutionary significant unit (ESU) – large geographic areas that are reproductively isolated from each other (i.e., different run and spawning timing). The National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service have agreed the grouping name for Pacific salmon will be ESU and for steelhead DPS. More information may be found in Federal Register ESA listings.

Table 3-71. ESA listed, special status and other important aquatic species found in Forest fifth field watersheds. The date in the status column is the date of listing or most recent status review and subsequent Federal Register notice for ESA listed species and the date of the most recent sensitive species list and/or Northwest Forest Plan Record of Decision for special status species.

Species	DPS/ESU	Status	Fifth Field Watersheds Where Found
Bull Trout (Salvelinus confluentus)	Columbia River DPS	Threatened 6/98	East Fork Hood River
Steelhead Trout (Oncorhynchus mykiss)	Lower Columbia River DPS	Threatened 1/06	Middle Sandy River, Upper Sandy River, Zigzag River, Salmon River, Middle Clackamas River, Upper Clackamas River, Collawash River, Oak Grove Fork Clackamas River, Eagle Creek, East Fork Hood River, West Fork Hood River
Steelhead Trout	Middle Columbia River DPS	Threatened 1/06	Fifteenmile Creek, Fivemile Creek, Middle Columbia/Mill Creek
Chinook Salmon (O. tshawytscha)	Lower Columbia River ESU	Threatened 6/05	Middle Sandy River, Upper Sandy River, Zigzag River, Salmon River, Bull Run River, East Fork Hood River, West Fork Hood River
Chinook Salmon	Upper Willamette River ESU	Threatened 6/05	Middle Clackamas River, Upper Clackamas River, Collawash River
Coho Salmon (O. kisutch)	Lower Columbia River ESU	Threatened 6/05	Middle Sandy River, Upper Sandy River, Zigzag River, Salmon River, Bull Run River, Middle Clackamas River, Upper Clackamas River, Collawash River, Oak Grove Fork Clackamas River, Eagle Creek, East Fork Hood River
US Forest Service, Region 6 Regional Forester's Special Status Species (R6 SS)			
Redband/ Inland Rainbow Trout (O. mykiss)	Not Applicable (N/A)	R6 SS – 1/08	White River, Tygh Creek, Fifteenmile Creek, Fivemile Creek, Middle Columbia/Mill Creek
Columbia duskysnail (Colligyrus sp. nov. 1)	N/A	R6 SS – 1/08, Rare & Uncommon – 1/01	Most 5th field watersheds within the Forest
Barren Juga (Juga hemphilli hemphilli)	N/A	R6 SS – 1/08	Unknown*
Purple-lipped Juga (Juga hemphilli maupinensis)	N/A	R6 SS – 1/08	Unknown*
Scott's Apatanian Caddisfly (Allomyia scotti)	N/A	R6 SS – 1/08	Salmon River and White River; may present elsewhere but surveys not conducted*.
Basalt Juga (Juga (Oreobasis) n. sp. 2)	N/A	Rare & Uncommon – 1/01	Middle Columbia/Mill Creek**
Other Species Addressed in this Analysis			
Pacific lamprey (Lampetra tridentata)	N/A	Culturally and locally important	Fifteenmile Creek, Fivemile Creek, Middle Columbia/Mill Creek, Middle Sandy River, Upper Sandy River, Zigzag River, Bull Run River, Middle Clackamas River, Upper Clackamas River, Collawash River, Oak Grove Fork Clackamas River
Cutthroat Trout (O. clarki)	N/A	Forest Management Indicator Species	Throughout the Forest except White River, Tygh Creek, Fifteenmile Creek, and West Fork Hood River 5th field watersheds.

*These three species were recently added to the Region 6 Regional Forester's Special Status Species list. Extensive surveys for these species have not been conducted. Habitat requirements (see below) indicate they could be present at least in some areas and where habitat is suitable they are assumed to be present.

**The Basalt Juga was found for the first time during the 2008 field season in North Fork Mill Creek. It has not been found in any other streams surveyed in the Forest. Given that all other known locations are within the Columbia Gorge near The Dalles it is presumed this snail is localized in distribution and not present in most watersheds on the Forest.

Aquatic macroinvertebrates are important residents of streams, lakes, and ponds in the Forest. Presence, abundance, and status of invertebrate species that reside in area water bodies are not well understood. Most streams within the Forest have good water quality within their natural constraints (e.g., glacial streams are naturally turbid at times and carry a high sediment load) and habitat conditions are generally favorable. Macroinvertebrate populations appear robust and a range of species representing a wide variety of feeding groups (predators, grazers, leaf shredders) are usually present, but definitive studies to characterize diversity, richness, and biomass are lacking. Therefore, the following discussion, as well as the effects analysis, focus on the four snails and one caddisfly listed in Table 3-71.

Listed or sensitive species in Table 3-71 were federally listed or designated as special status species for a number of factors. Although there are different reasons for their current status, as indicated in Table 3-71, common issues throughout their range include impaired fish passage at dams and other obstructions, commercial and recreational fishing, habitat modification and/or loss, hatchery influences, and pollution. Hydropower, irrigation, domestic water supply, and flood control dams have disrupted migrations and eliminated historically available habitat. Commercial and recreational fishing have reduced numbers of wild fish in some populations. Habitat has been degraded, simplified, and fragmented due to a variety of land management activities both on and off the Forest. Hatchery programs have influenced populations, partly by masking declines in native fish abundance and dilution of native gene pools due to interbreeding. Reduced water quality from both point and non-point sources has had an impact at localized and even watershed scales in some areas. Impacts to aquatic macroinvertebrates have primarily been from habitat modification and water quality degradation.

Columbia River Bull Trout

The only known population of bull trout in the Forest is found in the East Fork Hood River fifth field watershed. Bull trout presence in the Forest has been documented in the Middle Fork Hood River, Clear Branch both above and below Clear Branch Dam, Pinnacle Creek, Coe Branch, Eliot Branch, Bear Creek, and the mainstem Hood River below the Forest boundary (Figure 3-7: Map of Bull Trout Distribution). Most bull trout in the Forest are found primarily within Laurance Lake (reservoir), and in Clear Branch and Pinnacle creeks. Clear Branch Dam, completed in 1969, has effectively split the Hood River bull trout population into two segments. Although bull trout can migrate downstream over the dam when water is spilling, it is unknown how often and to what extent this occurs. There is an upstream migrant fish trap at the base of the dam but it has not been operated for several years.

Above the dam the population of bull trout is believed to exhibit primarily an adfluvial life history: adult fish reside in the reservoir and move into Clear Branch or Pinnacle Creek as early as June, spawn mainly during September, and move back into the reservoir to spend the winter. There may be a fluvial (completely stream dwelling) population component above the reservoir as well.

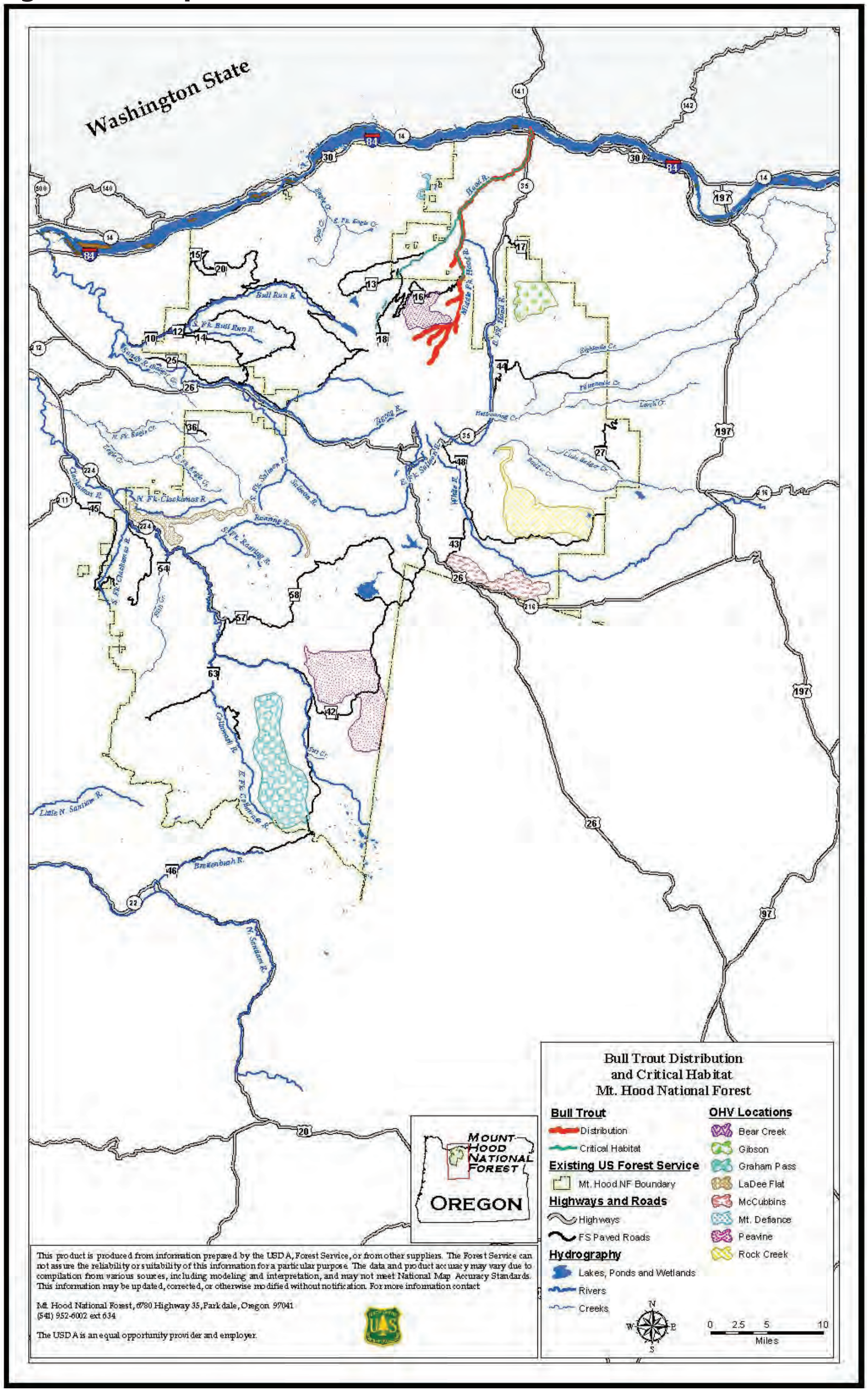
Below Clear Branch Dam it is believed there are fluvial and adfluvial subpopulations present, but relatively little is known about this segment of the overall population. A small number of individuals annually migrate into the Hood River from the Columbia River, and some individuals have returned more than once (Hood River Soil and Water Conservation District, 2004; French, 2006). Other large bull trout have been observed below Clear Branch Dam that are not tagged, thus leading biologists to believe there may be a wholly stream resident population as well.
Bull trout reach sexual maturity between four and seven years of age and are known to live as long as 12 years. Bull trout spawn in the fall, and require clean gravel and very cold water temperatures for spawning and egg incubation. Bull trout fry utilize side channels, stream margins, and other low velocity areas. Adults require large pools with abundant cover in rivers. Presumably, the various forms of bull trout interbreed, which helps to maintain viable populations throughout their range.

In 2008 the U.S. Fish and Wildlife Service completed a review of bull trout populations within their range of ESA listing. The Hood River population is described as "high risk, due to very limited and/or declining numbers, range, and/or habitat, making the bull trout in this core area vulnerable to extirpation." A discussion of the Hood River population is found in the 5-Year Review: Summary and Evaluation (http://ecos.fws.gov/docs/five_year_review/doc1907.pdf). A draft recovery plan was also completed for the Columbia River DPS in 2002 (USFWS). This document is also available on the web at http://www.fws.gov/pacific/bulltrout/Recovery.html.

In 2004 a working group of fisheries biologists convened to consider reintroducing bull trout into the upper Clackamas River. Bull trout were once abundant and widely distributed in the Clackamas River. The impetus is based on the listing of bull trout as threatened under the ESA, and the goal of that law is to recover species from being threatened or endangered to the point that they no longer need its protection. A draft proposal for bull trout reintroduction was developed in 2007 amongst cooperating state and federal agencies in coordination with the Confederated Tribes of the Warm Springs Reservation of Oregon (http://www.fws.gov/oregonfwo/Species/Data/BullTrout/ReintroductionProject.asp).

Pending additional state, federal, and tribal administrative and rule-making procedures, reintroduction could begin in 2010 at the earliest. Reintroduction areas under consideration include Rhododendron Creek, Hunter Creek, Berry Creek, Cub Creek, Last Creek and Pinhead Creek, and the Upper Clackamas River.

Figure 3-7. Map of bull trout distribution.



Lower Columbia River Steelhead

Lower Columbia River steelhead are fairly widespread in the Forest as they are found in several fifth field watershed within the Clackamas, Sandy, and Hood River Basins (Table 3-71 and Figure 3-8: Map of Lower and Middle Columbia River steelhead trout distribution). Adult winter steelhead enter rivers and streams on the Forest primarily from March through June. A small run of summer steelhead occurs in the Hood River. These fish enter the mainstem Hood River from June through September, over winter in larger tributaries or the mainstem, and spawn the following spring. Adult steelhead spawn in late winter to spring (January–June), depending in part on the run type (summer or winter steelhead), stream discharge and water temperature. Steelhead fry emerge from the gravel between late June and late July, and rear in freshwater habitat for one to three years. Yearling juvenile steelhead are usually found in riffle habitat, but some of the larger juvenile steelhead are found in pools and faster runs. Smolt emigration takes place primarily from March through June during spring freshets.

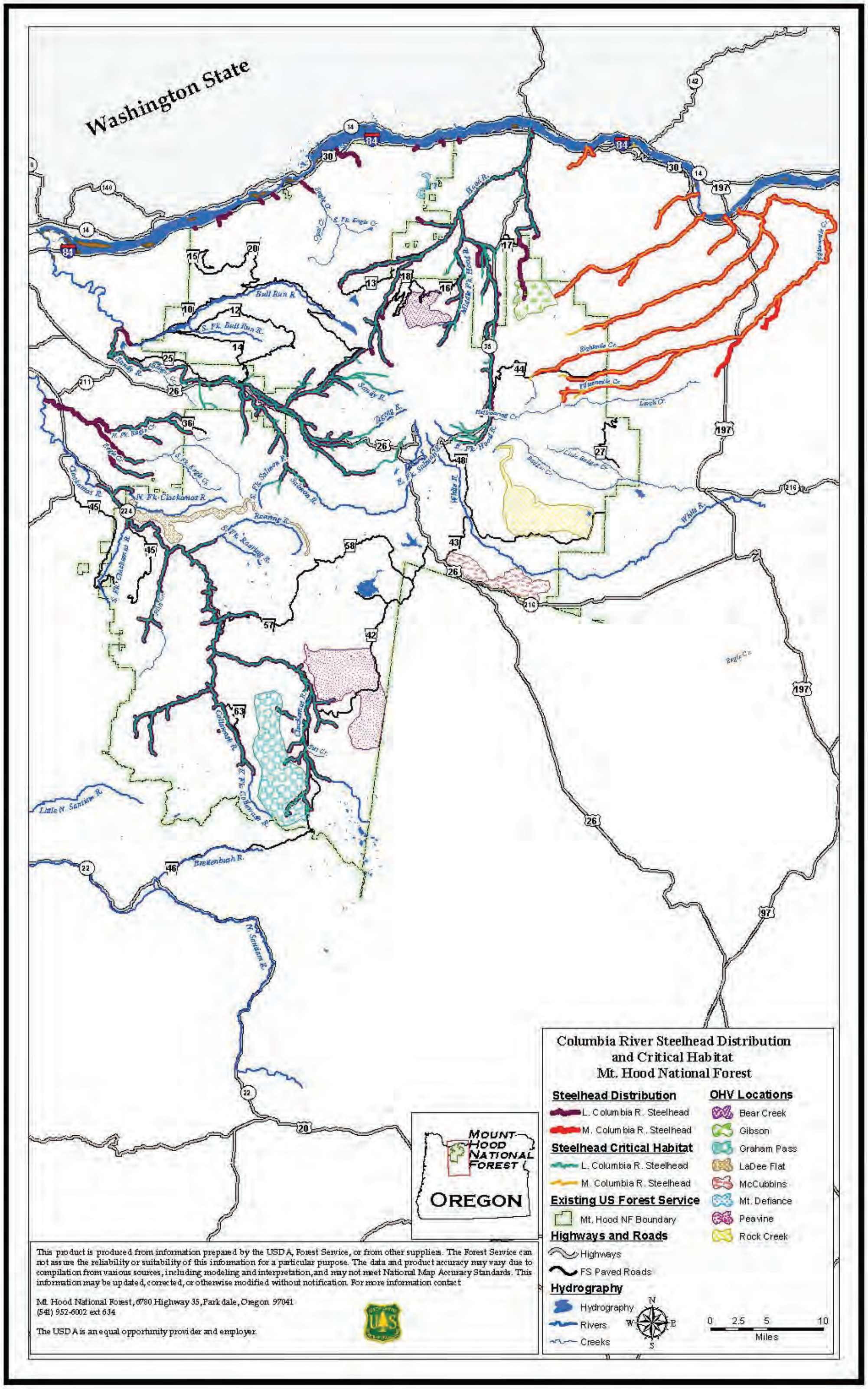
In regards to habitat utilization, steelhead are more of an opportunist anadromous species compared to salmon. As such, they are often more widespread and can utilize smaller streams more readily than many salmon species. Their stronghold habitats on the Forest tend to be larger rivers and streams. Recovery planning is ongoing for Lower Columbia River steelhead but a draft recovery plan has yet to be completed. A full description of the status of the ESA listing and status of the DPS may be found at http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/.

Middle Columbia River Steelhead

Middle Columbia River steelhead presence on the Forest is limited to the Fifteenmile, Fivemile and Middle Columbia/Mill Creek fifth field watersheds (Figure 3-8: Map of Lower and Middle Columbia River steelhead trout distribution). This stock is the easternmost run of wild winter steelhead trout in the Columbia River Basin[3], and thus, is unique at local and regional scales. Steelhead have been documented upstream of the Forest boundary in North Fork Mill Creek, Fifteenmile Creek, Ramsey Creek, Fivemile Creek, and Eightmile Creek. A barrier falls restricts steelhead from ascending to the Forest in South Fork Mill Creek. Life history information and run timing is similar to that described for Lower Columbia River winter steelhead. A draft recovery plan for the Middle Columbia River Steelhead DPS was completed in 2008 (NMFS). A full description of the status of the ESA listing and status of the DPS, including the draft recovery plan, may be found at http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/.

3 It has not been confirmed that steelhear in the Mill Creek Watershed are the same genetic stock as those found in the Fifteenmile Creek and Fivemile Creek fifth field watersheds. The US Forest Service assumes these fish are the same, but that has not been validated.

Figure 3-8. Map of Lower and Middle Columbia River steelhead trout distribution.



Lower Columbia River Chinook

Lower Columbia River Chinook salmon are found in several fifth field watersheds within the Sandy and Hood River Basins on the Forest (Table 3-71 and Figure 3-9: Map of Lower Columbia River and Upper Willamette River Chinook salmon distribution). This ESU is made up of both spring and fall run components.

Most spring Chinook salmon in the Hood River Basin ascend the West Fork Hood River, and based on available information, use appears to be low in the East and Middle forks of the Hood River. Fall Chinook are found only in the mainstem Hood River and up to Punchbowl Falls near the mouth of the West Fork Hood River below the Forest boundary.

Spring Chinook in the Sandy River Basin utilize the mainstem Sandy River and upper basin tributary streams, such as the Salmon River, Zigzag River, Still Creek, and Clear Fork of the Sandy River. They enter these watersheds from April through August and spawn from August through early October. Spring-run Chinook salmon in the Sandy River have been influenced by spring-run Chinook salmon introduced from the Willamette River ESU. Analyses, however, suggest that considerable genetic integrity still exists in the Sandy River population (Myers et al., 1998).

Fall Chinook within the Sandy River primarily spawn and rear in the mainstem and larger tributaries downstream from the Forest boundary. Most fall run fish emigrate to the marine environment as sub-yearlings. Modifications in the river environment have altered the duration of freshwater residence. Tule fall Chinook salmon return at adult ages three and four; "bright" fall Chinook salmon return at ages four, five, and six.

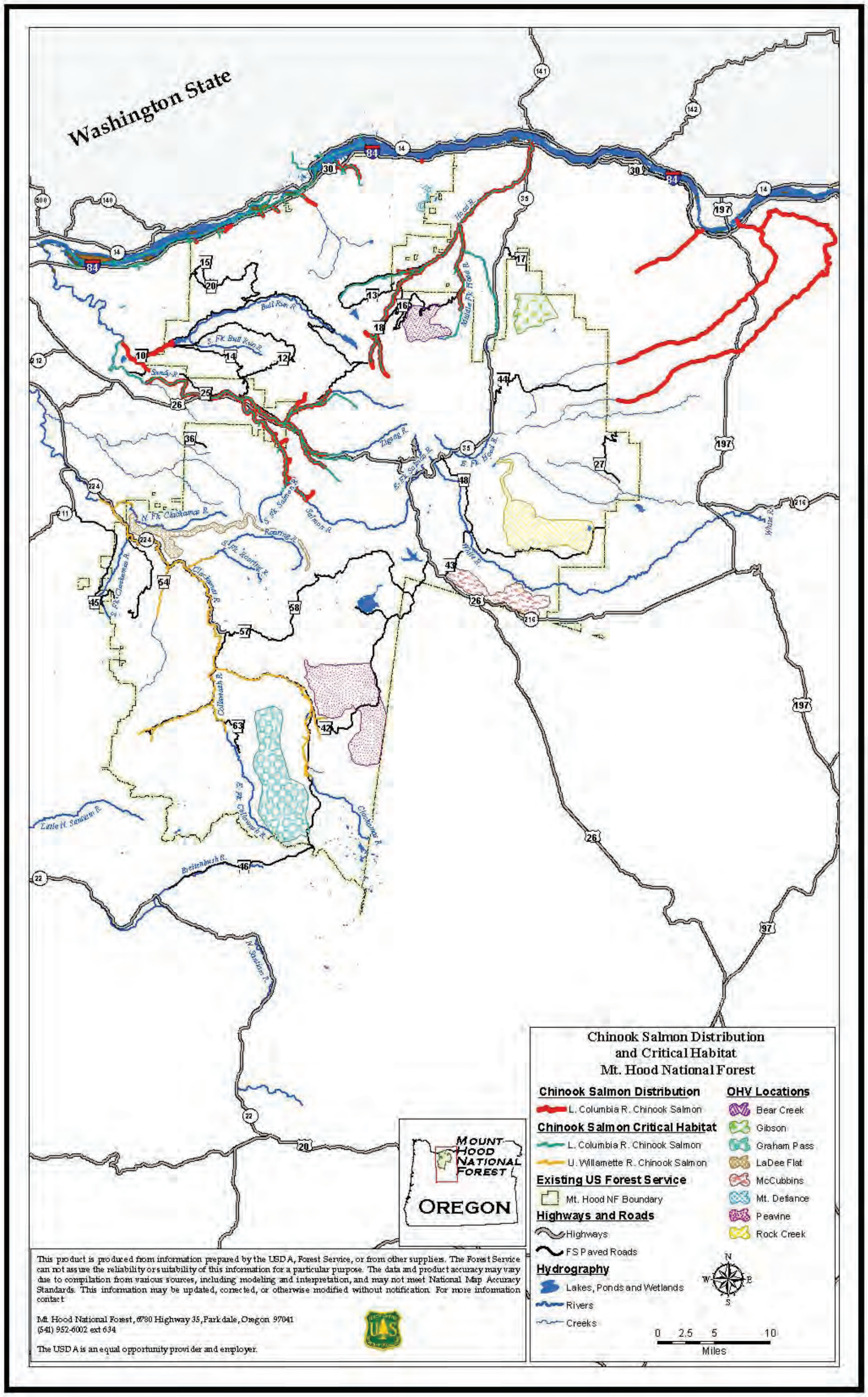
A full description of the status of the ESA listing and status of the ESU may be found at http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/. As with LCR steelhead a draft recovery plan has not been prepared for LCR Chinook salmon.

Upper Willamette River Chinook

Upper Willamette River spring Chinook salmon occur only in the Clackamas River Basin within the Forest (Table 3-71 and Figure 3-9: Map of Lower Columbia River and Upper Willamette River Chinook salmon distribution). The ESU consists of both naturally spawning and hatchery produced fish. These spring Chinook enter the Clackamas River from April through August and spawn from September through early October. These fish primarily spawn and rear in the mainstem Clackamas River and larger tributaries. Spawning in the upper Clackamas drainage has been observed in the mainstem Clackamas from the head of North Fork Reservoir upstream to Big Bottom, the Collawash River, Hot Springs Fork of the Collawash River, lower Fish Creek, South Fork Clackamas River, Oak Grove Fork, and Roaring River.

The life history of Upper Willamette River Chinook includes traits from both ocean- and stream-type developmental strategies. The timing of the spawning migration is limited by Willamette Falls. High flows in the spring allow access to the Upper Willamette River Basin, whereas low flows in the summer and autumn prevent later-migrating fish from ascending the falls. The low flows may serve as an isolating mechanism, separating this ESU from others nearby. A full description of the status of the ESA listing and status of the ESU may be found at http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/. A recovery plan has yet to be prepared.

Figure 3-9. Map of Lower Columbia River and Upper Willamette River Chinook salmon distribution.



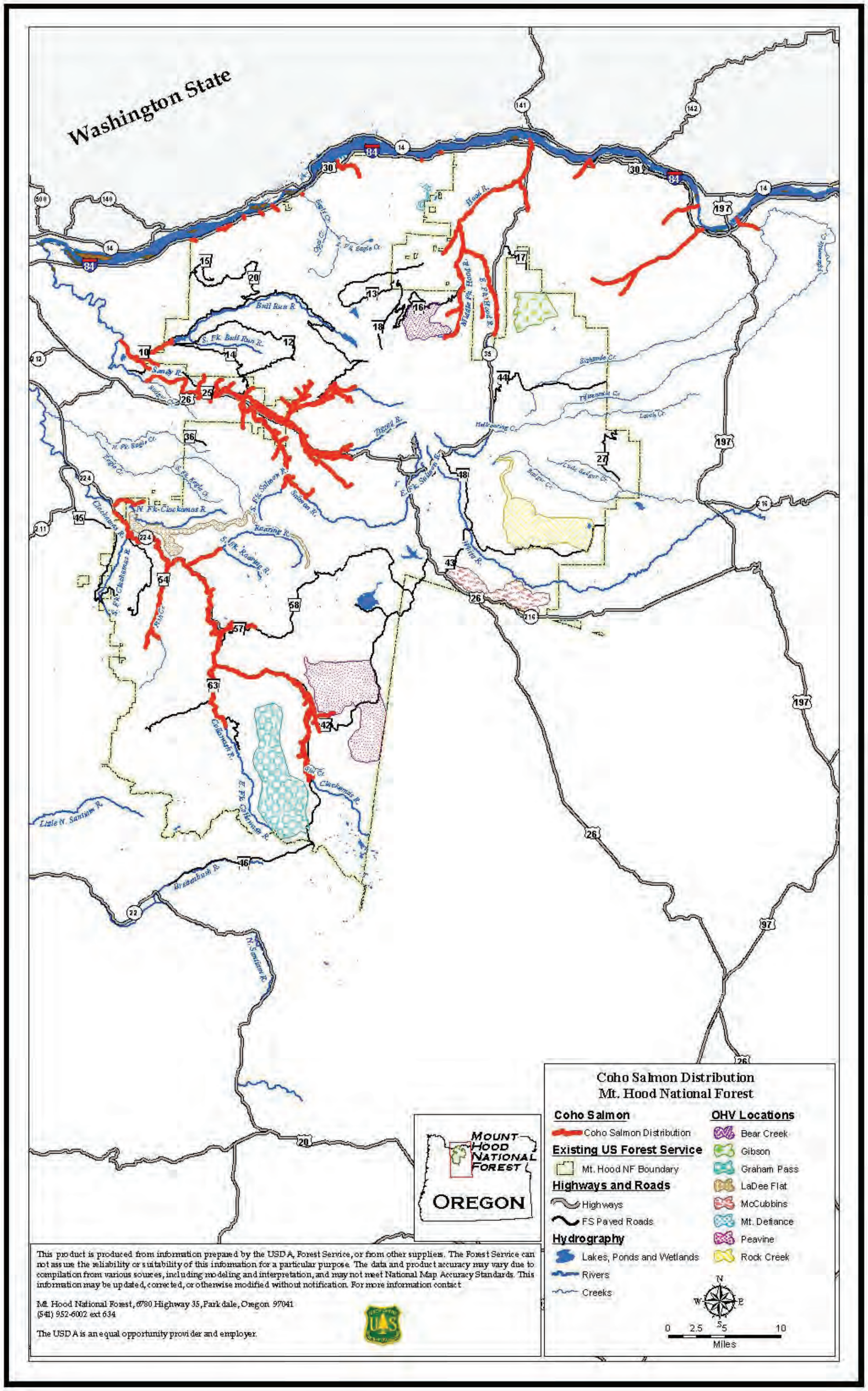
Lower Columbia River Coho Salmon

Coho stocks occurring on the Forest are currently found in various fifth field watersheds within the Sandy, Clackamas, and Hood River Basins (Table 3-71 and Figure 3-10: Map of Lower Columbia River Coho salmon fish distribution). The indigenous run of coho salmon in the Hood River is at a very low level and may be extinct, but there is some natural reproduction occurring (French, 2006). The coho salmon that do enter the Hood River appear to primarily utilize the mainstem as well as the lower reaches of the East Fork Hood River.

The Clackamas River contains an early run stock and the last significant run of wild late-winter coho in the Columbia River Basin. Spawning occurs mid-September to the end of April with the peak occurring mid-February. Adults prefer deep pools and tributaries for over-wintering, while juveniles will seek out inundated floodplains and other protected slow-water habitats, such as side channels and slow water pools. Woody debris and habitat diversity are important to this species. Primary streams utilized in the Sandy River Basin include the Sandy River, Salmon River, Still Creek, and Zigzag River. In the Clackamas River, coho are found mostly in the Clackamas River, Collawash River, Fish Creek, Oak Grove Fork, and Hot Springs Fork.

A full description of the status of the ESA listing and status of the ESU may be found at http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/. A recovery plan has yet to be prepared.

Figure 3-10. Map of Lower Columbia River Coho salmon distribution.



US Forest Service, Region 6 Regional Forester's Special Status Sensitive Species

As part of the National Environmental Policy Act process the Forest Service reviews programs and activities to determine their potential effect on sensitive species. Species on the Mt. Hood National Forest included in the January 2008 Regional Forester's Special Status Species List are described below.

Redband Trout: Redband/inland rainbow trout (redband trout) occur in the White River, Tygh Creek, Fifteenmile Creek, Fivemile Creek, and Middle Columbia/Mill Creek fifth field watersheds on the Forest (Figure 3-11: Map of rainbow/redband and cutthroat trout distribution). Redband trout populations within the White River and Tygh Creek watersheds are genetically distinct from those in the Deschutes River and are unique among other redband trout populations east of the Cascades (Currens et al. 1990). Rainbow trout within the other watersheds listed above are believed to be the redband subspecies (Behnke 1992), but definitive genetic analysis has not been conducted.

Spawning occurs in the spring. Fry emergence from the gravel normally occurs by the middle of July, but depends on water temperature and exact time of spawning. Redband trout prefer water temperatures from 50 to 57 ^{o}F, but have been found actively feeding at temperatures up to 77 ^{o}F in high desert streams of Oregon and have survived in waters up to 82 ^{o}F.

Columbia Duskysnail: This species of aquatic mollusk has been found across the Forest during surveys conducted over the past several years (Mt. Hood National Forest, unpublished data). Habitat requirements for this species are fairly specific: cold well oxygenated springs, seeps, and small streams, preferring areas without aquatic macrophytes (Furnish and Monthey 1998). Individuals have not been found in larger streams and rivers, or glacial streams.

Surveys for the Columbia duskysnail have been conducted at sites across the Forest for a wide range of projects. This aquatic mollusk species has been found in many locations across the Forest and it is presumed to be present in seeps, springs, and smaller streams near OHV use locations proposed in this EIS.

Purple-lipped Juga: The Purple-lipped Juga snail is endemic to Oregon. It is found in large streams at low elevations. These snails prefer riffle habitat with stable gravel substrates, in cold well oxygenated water. It is more tolerant of silt and slack water than other Juga subspecies. The known range of the species is the Lower Deschutes River drainage, below Pelton Dam, and the Warm Springs River in Wasco and Sherman counties, Oregon. Sites where the species are known to occur are located on the Warm Springs Reservation and Prineville BLM in the Deschutes Wild and Scenic River Area. There are few locations on the Forest that match the above preferred habitat description. These locations are in larger rivers likely near the Forest boundary. Streams within or near proposed OHV locations do not meet the above habitat description and thus it is assumed that this snail is not present in these locations although surveys have not been conducted.

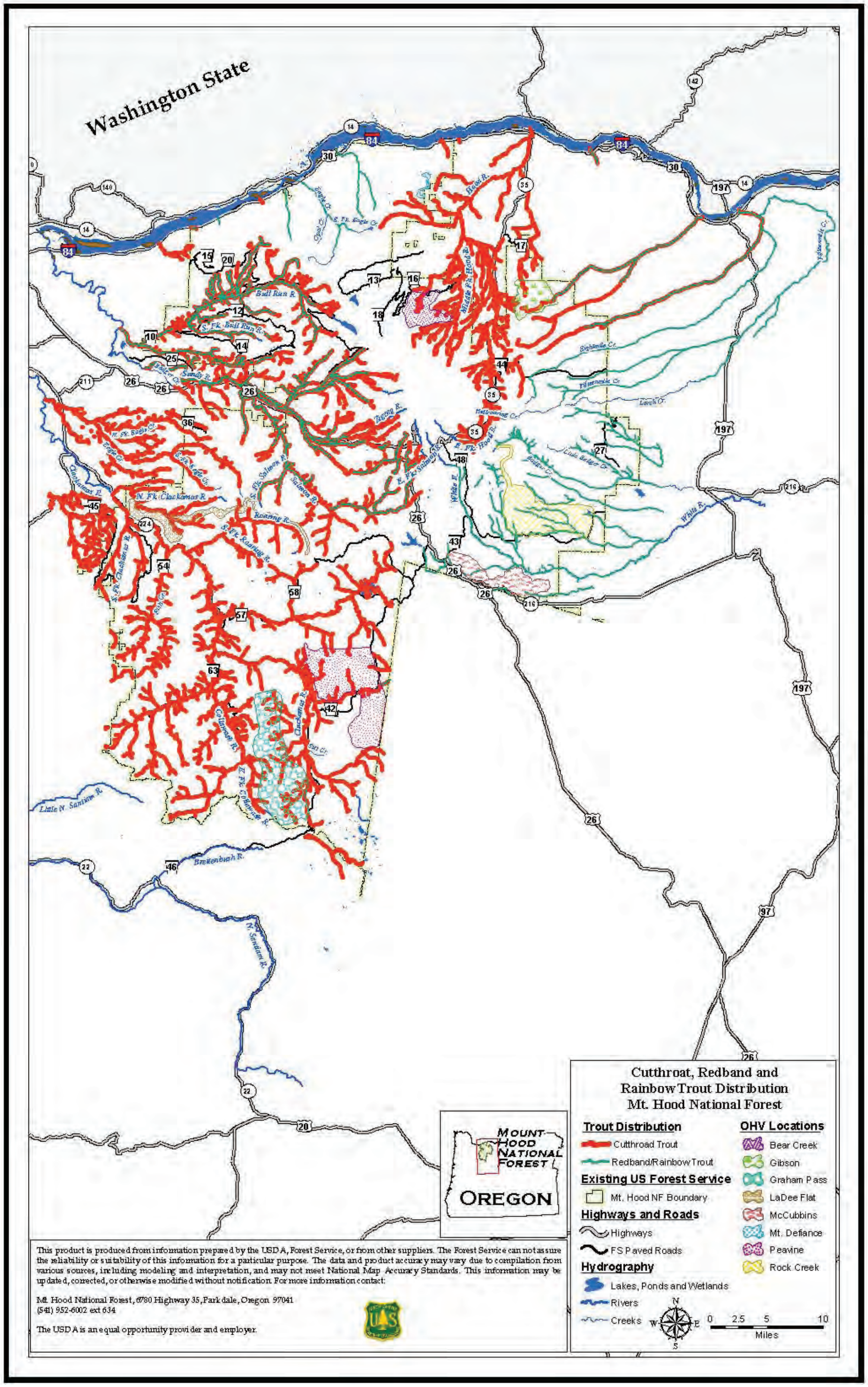
Barren Juga: This species of aquatic mollusk is found in freshwater habitats in small to medium sized highly oxygenated cold water streams at low elevations. The species prefers streams that have moderate velocity level bottoms with stable gravel substrates. The known range of this species is the Columbia River Gorge in Oregon and Washington. They have been found in the Mt. Hood National Forest and the Columbia River Gorge National Scenic Area. They are also suspected to occur in the Gifford Pinchot National Forest. Where streams match this description near proposed OHV locations the presence of this snail is assumed.

Scott's Apatanian Caddisfly: This species of caddisfly inhabits small cold mountain streams. The species has been found in four locations on Mt. Hood in two fifth field watersheds (White River and Salmon River): an alpine stream below Timberline Lodge, the south fork of Iron Creek, from a stream at the junction of Highways 35 and 48, and on a tributary of the Salmon River. The species may occur in other localities on or near Mt. Hood; however extensive surveys have not been conducted.

Basalt Juga: The Basalt Juga is not a sensitive species but it is on the Region 6 Regional Forester's Special Status Species list. It is a rare and uncommon species as outlined in the Northwest Forest Plan. These small snails have only been found in one survey on the Forest in North Fork Mill Creek. They have not been found in any other stream or water body surveyed since Forest personnel began surveying in 1998. They are not believed to reside in watersheds other than those that drain into the Columbia River near The Dalles, Oregon. Their habitat requirements appear similar to the Columbia duskysnail's (Furnish and Monthey 1998).

Surveys for the four special status aquatic mollusks and the one caddisfly were not conducted as part of this project. Instead of conducting surveys, species presence is presumed where habitat conditions are similar to those described above. Riparian reserve standards and guidelines and project design criteria are sufficient to provide for the habitat needs of this species. Anticipated effects of implementing the action alternatives would not significantly affect habitat or species persistence at each site.

Figure 3-11. Map of rainbow/redband and cutthroat trout distribution.



Other Important Aquatic Species

Pacific lamprey: Relatively little is known about Pacific lamprey distribution and population status in streams within the Forest compared to salmonids. These fish have been documented in various watersheds including Fifteenmile Creek, Mill Creek, Clackamas River, and the Sandy River (Table 3-71). Pacific lamprey are culturally important to indigenous tribes in the area and some tribal fishing does occur in Fifteenmile Creek near the mouth.

A falls near the mouth of the White River is a complete barrier to all fish species, thus Pacific lamprey are not present in this watershed upstream of that point. A dam barrier in the Hood River appears to preclude lamprey migration upstream. Pacific lamprey have been documented in Fish Creek, tributary to the Clackamas River upstream of North Fork Dam, but their overall distribution in the Clackamas River within the Forest is not well understood.

Pacific lamprey have a unique life history (Wydoski and Whitney, 2003). The adults spawn from April through July in streams. Eggs hatch in about three weeks and the larvae burrow into silt and mud in slower areas of coldwater streams. The larvae live in the stream bottom like this for four to seven years at which point they metamorphose into adults and migrate to the Pacific Ocean to begin their adult, parasitic lifestyle.

Coastal cutthroat trout: Cutthroat trout residing in waters of the Forest are composed of two native stocks: an anadromous (sea run) form and resident stock. These fish are a Management Indicator Species on the Forest. Resident populations of cutthroat are widespread throughout much of the Forest (Table 3-71 and Figure 3-11: Map of rainbow/redband and cutthroat trout fish distribution). Historically, sea run cutthroat trout occurred in the Clackamas River, Sandy River, and Hood River basins, but anadromous cutthroat populations appear to have greatly declined throughout these watersheds. Consistent indicators in abundance trends for most populations of either resident or sea run cutthroat trout do not exist.

Coastal cutthroat trout tend to spawn in small (first and second order) tributaries. They spawn from December to May; young emerge from gravel during June and July. Young fry move into channel margin and backwater habitats during the first several weeks. During the winter, juvenile cutthroat trout use low velocity pools and side channels with complex habitat created by large wood or other features. Coastal sea run cutthroat juveniles rear in freshwater for two to three years.

Critical Habitat

Critical habitat has been designated for Columbia River bull trout, Lower Columbia River steelhead trout, Mid-Columbia River steelhead trout, Lower Columbia River Chinook salmon, and Upper Willamette River Chinook salmon. Much of the discussion concerning critical habitat, including effects analyses, will center on the primary constituent elements (PCE) described below for each species.

Bull Trout Critical Habitat

Bull trout critical habitat has been designated in the mainstem Hood River, West Fork Hood River, Middle Fork Hood River, and a short section of the East Fork Hood River (70 Federal Register 56233, September 26, 2005). The upper limit of designated critical habitat was halted at the Forest boundary in the West Fork and Middle Fork, but also includes sections of the West Fork Hood River privately owned within the Forest. No bull trout critical habitat was designated elsewhere in the Forest.

The PCE of bull trout critical habitat are derived from studies of bull trout habitat requirements, life history characteristics, and population biology. These PCE are:

1. Permanent water having low levels of contaminates such that normal reproduction, growth and survival are not inhibited.
2. Water temperatures ranging from 36 to 59^{0}F, with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life history stage and for geography, elevation, diurnal and seasonal variation, shade, such as that provided by riparian habitat, and local groundwater influence.

3. Complex stream channels with features such as woody debris, side channels, pools, and undercut banks to provide a variety of depths, velocities, and instream structures.
4. Substrates of sufficient amount, size, and composition to ensure success of egg and embryo over-winter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine substrate less than 0.25 inch in diameter and minimal substrate embeddedness are characteristic of these conditions.
5. A natural hydrograph, including peak, high, low, and base flows within historic ranges or, if regulated, a hydrograph that demonstrates the ability to support bull trout populations.
6. Springs, seeps, groundwater sources, and subsurface connectivity to contribute to water quality and quantity.
7. Migratory corridors with minimal physical, biological, or chemical barriers between spawning, rearing, over-wintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows.
8. An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.
9. Few or no predatory, interbreeding or competitive non-native species present.

Steelhead Trout and Chinook Salmon Critical Habitat

Critical habitat for the above species was designated in September 2005 by the NMFS (70 Federal Register 52630, September 2, 2005). Unlike bull trout critical habitat, which did not include stream reaches in the Forest, critical habitat for steelhead and Chinook encompasses most of the available anadromous habitat across all land ownerships. Lower Columbia River steelhead and Chinook critical habitat is the most ubiquitous across the Forest because these species are the most widespread. Mid-Columbia River steelhead critical habitat is present only in the Fifteenmile Creek and Mill Creek watersheds on the eastside of the Forest. Critical habitat for Upper Willamette River Chinook is designated in the Clackamas River Watershed.

Primary constituent elements for steelhead and Chinook are sites and habitat components that support one or more life stages. The first three, listed below, refer to freshwater habitat components, whereas the last three relate to estuarine or marine habitat components. Nothing proposed in any alternative would have an affect on estuarine or marine habitat components, thus they are not discussed.

1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.
2. Freshwater rearing sites with:
   a. Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
   b. Water quality and forage supporting juvenile development; and
   c. Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
3. Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions, and natural cover, such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance essential fish habitat (EFH) for those species regulated under a Federal fisheries management plan – in this case, Chinook and coho salmon. Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all proposed actions that may adversely affect EFH. Adverse effects include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH.

Pacific salmon (Chinook and coho) EFH was designated in 1999, but the actual identification of stream reaches considered to be EFH was left to the action agencies, such as the US Forest Service. Essential Fish Habitat is coincident with Chinook salmon critical habitat where it's designated. In addition, however, there are streams within the Fifteenmile Creek and Mill Creek watersheds that support either Chinook and/or coho, but were not designated as critical habitat. Specifically, the US Forest Service considers the following stream segments as EFH: Fifteenmile Creek from its mouth to the Forest boundary; Eightmile Creek from its mouth to the Forest boundary; Mill Creek from its mouth to the confluence of the North and South Forks; South Fork Mill Creek from its mouth to the impassable falls at near river mile 2.3; and North Fork Mill Creek from its mouth to the Forest boundary.

Table 3-72 summarizes ESA listed fish and Regional Forester's Special Status Species presence/absence, as well as designated critical habitat and essential fish habitat, by proposed OHV locations. Species and or suitable habitat found directly adjacent to proposed locations (i.e., fish known to reside in streams at or within 0.5 miles downstream of road/trail crossings) are designated with a "Y" in the table. In many cases the respective species may only reside in one stream near a proposed OHV location. The table is intended to give the reader a basic idea of where various aquatic fauna are located in relation to proposed OHV locations along with Figures 3-7 through 3-11. Aquatic fauna distribution related to specific OHV locations will be discussed in the effects section below.

Table 3-72. Presence of ESA listed fish, Regional Forester's Special Status Species, designated critical habitat, and essential fish habitat within one half mile of the eight proposed OHV locations on the Mt. Hood National Forest.

Species/Habitat	Peavine	LaDee Flats	Bear Creek	Gibson Prairie	McCubbins Gulch	Rock Creek	Graham Pass	Mt. Defiance
ESA Listed Fish Species								
Bull Trout	N[1]	N	N	N	N	N	N[1]	N
Steelhead Trout (LCR)	N	N	N	N	N	N	Y	N
Steelhead Trout (MCR)	N	N	N	Y	N	N	N	N
Chinook Salmon (LCR)	N	N	N	N	N	N	N	N
Chinook Salmon (Willamette)	N	N	N	N	N	N	N	N
Coho Salmon (LCR)	N	N	N	N	N	N	N	N
Region 6 Regional Forester's Special Status Species								
Redband/ Inland Rainbow Trout	N	N	N	Y	Y	Y	N	N
Columbia duskysnail	Y	Y	Y	Y	Y	Y	Y	N
Barren Juga	Unk	Unk	Unk	Unk	Unk	Unk	Unk	N
Purple-lipped Juga	Unk2	Unk2	Unk2	Unk2	Unk2	Unk2	Unk2	N
Scott's Apatanian Caddisfly	Unk	Unk	Unk	Unk	Unk	Unk	Unk	N
Basalt Juga (Rare & Uncommon)	N	N	N	Y	N	N	N	N
Other Important Aquatic Species								
Pacific lamprey	Unk	Unk	N	N	N	N	Unk	N
Coastal Cutthroat Trout (MIS)	Y	Y	Y	Y	N	N	Y	N
Critical/Essential Fish Habitat								
Bull Trout Critical Habitat	N	N	N	N	N	N	N	N
Steelhead Critical Habitat	N	N	N	Y	N	N	Y	N
Chinook Critical Habitat	N	N	N	N	N	N	N	N
Essential Fish Habitat	N	N	N	N	N	N	N	N

1Bull trout are not currently present in streams in the Peavine and Graham Pass OHV locations but are proposed for reintroduction nearby.
Table Key

N – species/habitat not present

Y – species/habitat known to be present

Unk – species presence unknown but suspected either due to nearby surveys or presence of suitable habitat.

Unk2 – species presence unknown but not suspected due to habitat preferences (large, low elevation streams).

MIS – Mt. Hood National Forest Management Indicator Species

Aquatic Habitat Conditions

Introduction

Aquatic habitat conditions across the Forest vary depending on the location, past land management activities, and natural events such as floods, fire, and debris torrents. In general, streams that have experienced little to no land management are in good condition even though Forest Plan standards (i.e., pools per mile, pieces of wood per mile, etc.) are not always met. Some of these streams have been impacted by natural events and, indeed, were formed or maintained by such events. Glacial streams such as the Sandy River, White River, Newton Creek and Eliot Branch are examples of streams exhibiting relatively degraded, but natural, conditions due to natural events (in this case repeated glacial debris flows).

Fish habitat conditions within watersheds where land management has occurred range from poor to good, depending on the type and scale of disturbance, proximity to streams, timing and duration of land management activities, and sensitivity of channel type to perturbation. On the westside of the Cascades, watersheds have been affected by logging, dams, road construction, and past flood control activities. On the eastside, major land management activities contributing to degraded aquatic habitat have included logging, road construction, irrigation water withdrawals, agriculture, and grazing. Separately and cumulatively, these activities have resulted in some loss of function of natural processes such as large wood recruitment and movement, connectivity of habitat, reduction of stream shading, alteration in riparian vegetation and function, increased sedimentation, reduced instream large woody debris, and loss of pools.

Forest management has changed since the signing of the Northwest Forest Plan in the early 1990's. Changes in management of riparian areas have resulted in overall long-term recovery of riparian areas providing benefits to aquatic species. Examples include thinning streamside plantations to accelerate development of older stand conditions and obliteration of roads with a high risk of sediment production into streams. Despite past management impacts, most streams or stream segments contain some optimal fisheries habitat. There are no streams with degraded conditions over their entire length within the Forest, even those streams listed on the Department of Environmental Quality (DEQ) 303d list. A common scenario is shorter stream segments experiencing some impairment interspersed with good habitat quality reaches. Water quality, in terms of temperature and fine sediment, is good to excellent across most of the Forest with few streams listed on the DEQ 303d list (see Water Quality Section for a complete discussion on water quality), but in some streams habitat/water quality conditions decline further downstream.

Action Area Description

The Action Area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action [50 CFR §402.02]. Several aquatic habitat elements could be impacted by OHV use (discussed in detail below) but the primary elements that could be degraded are substrate and water quality from fine sediment and elevated turbidity, respectively. In regards to aquatic fauna and habitat potential effects would be most likely within 100 feet of surface water and particularly at road/trail stream crossings. However, fine sediment and turbid conditions would extend downstream varying distances from sources depending on stream flow, stream size, gradient, and habitat complexity (the more complex the habitat the more likely sediment would be trapped behind logjams or other structure). In no case, however, would fine sediment resulting from OHV use or related actions proposed in this EIS travel further downstream than one half mile from the source. This is based on the relatively small amounts potentially generated at each source and the fact that the sediment would be diluted and dissipated rapidly as it travels downstream. Both the National Marine Fisheries Service (NMFS 2007) and U.S. Fish and Wildlife Service (FWS 2007) agreed that fine sediment (including turbidity) related effects would not extend further downstream than one half mile from in-stream restoration activities such as culvert replacement and large wood addition. Only culvert removal proposed in this EIS as part of road decommissioning would result in fine sediment levels commensurate with those analyzed by the NMFS and FWS; other actions would produce far less fine sediment. *As such, the action area for the fisheries and other aquatic fauna effects analysis includes existing and proposed roads/trails and other use areas, staging areas, and those streams crossed by roads/trails extending to a point up to, but not exceeding, one half mile downstream.*

Note that the following summary, and resultant analysis of effects, is organized by proposed OHV locations and not by fifth field or smaller watershed. This is because the proposed locations are relatively small and anticipated effects would not extend more than one half mile downstream. Any effects would be immeasurable at the fifth, and likely even the sixth, field scale given the expected magnitude of effects and proposed concentration of OHV use.

Aquatic Habitat Conditions Affected by One or More Alternative

Existing habitat conditions and subsequent analysis will focus on those habitat elements that could be affected by OHV use, trail construction, road decommissioning, conversion from road to trail, and designation of staging areas: fine sediment and substrate, pool quality, water chemistry, and connectivity (i.e., fish passage). Other habitat elements, such as water temperature, off-channel habitat areas, large wood levels, etc. would not be affected by OHV use and proposed actions so these elements are not discussed. The majority of streams within the Forest are in good condition for the habitat elements to be discussed based on available information from water quality and physical habitat surveys (stream surveys on file at Ranger District offices).

Fine Sediment and Substrate

Levels of fine sediment (defined here as sand or silt <1 mm in diameter) in spawning habitat or riffles within stream reaches across the Forest vary widely (Table 3-73) depending on a variety of factors, including parent soil type, stream size, gradient, flow regime, water source (e.g., glacial, spring-fed, snowmelt), and past land management activities. Note that many streams outlined in Table 3-73 were surveyed over a decade ago; conditions likely have changed but the most recent survey information is displayed. Many streams on the Forest have naturally high sediment loads given their glacial origin. Local fish stocks and other stream dwelling animals have evolved to survive in these glacial conditions. Numerous studies have taken place to try and determine the amount of fine sediment in spawning gravel that limits survival of salmonid embryos. Many investigators have accepted that significant embryo mortality can be expected when fine sediment <0.8 mm approaches or exceeds 20 percent of the redd (Waters 1995).

As mentioned above, there are segments of some streams with high amounts of fine sediment that may be detrimental to salmonid spawning and egg incubation, reduce insect production or survival, and may decrease available rearing habitat by filling pools or other slow water areas. In glacial streams, such as the Sandy and East Fork Hood rivers, this is largely a natural phenomenon. In non-glacial streams the amount of fine sediment in suitable spawning areas and riffles can exceed 20 percent, thus exceeding the standards set in the Forest Plan. This standard is often exceeded in streams that have experienced little to no land management indicating the source is natural.

In other areas the high amounts of fine sediment are a result of or exacerbated by past land management, very often roads. Some types of watershed restoration projects, such as road decommissioning, are designed to reduce sediment inputs from roads. During the past 10 years, over 410 miles of roads (representing about 10 percent of the road system) have been decommissioned and hydrologic function has been restored on the decommissioned segments (2003 Roads Analysis, Mt. Hood National Forest). Reductions in sediment transport to streams due to road decommissioning may not be reflected in the values in Table 3-73, due to the age of the surveys.

Table 3-73. Spawning habitat fine sediment levels in surveyed streams within or downstream of proposed OHV locations in the Mt. Hood National Forest. Fine sediment values highlighted in green are <2 mm as that was the survey protocol during those surveys. Reaches in bold italics are those that do not meet Forest Plan standards. Begin and end miles are the river miles of the surveyed reach. There were no streams surveyed near the Mt. Defiance OHV location.

OHV Location	Survey Year	Stream Name	Reach	Begin Mile	End Mile	Fines <1 mm (%)
Bear Creek	2001	Bear	1	0	2.2	0
Bear Creek	1996	Tony	1	0	2.3	8
Bear Creek	1996	Tony	2	2.3	2.8	1
Bear Creek	1996	Tony	3	2.8	4.6	4
Bear Creek	1996	Tony	4	4.6	4.9	0
Bear Creek	1996	Tony	5	4.9	6.9	5
Bear Creek	1996	Tony	6	6.9	8	0
Gibson Prairie	2000	NF Mill	1	6.4	11.2	18
Gibson Prairie	***2000***	***NF Mill***	***2***	***11.2***	***12.4***	***44***
Gibson Prairie	1999	WF Neal	1	2.2	8.9	19
Graham Pass	1999	Cub	1	0	2.2	3
Graham Pass	1999	Cub	2	2.2	3.9	3
Graham Pass	1999	Cub	3	3.9	5.4	0
Graham Pass	1999	Cub	4	5.4	6.7	15
Graham Pass	***1999***	***Cub***	***5***	***6.7***	***7.4***	***70***
Graham Pass	2000	Jazz Creek	1	0	2.6	12
Graham Pass	2001	Rhododendron	1	0	0.8	0
Graham Pass	2001	Rhododendron	2	0.8	2.4	6
Graham Pass	2001	Rhododendron	3	2.4	3.5	6
Graham Pass	1998	Tumble	1	0	1.1	13
Graham Pass	***1998***	***Tumble***	***2***	***1.1***	***1.7***	***22***
LaDee Flats	1996	NF Clackamas	1	0	2	3
LaDee Flats	1996	NF Clackamas	2	2	2.8	1
LaDee Flats	1996	NF Clackamas	3	2.8	5.9	3
LaDee Flats	1996	NF Clackamas	4	5.9	7.1	2
LaDee Flats	1996	NF Clackamas	5	7.1	7.6	7
LaDee Flats	1996	NF Clackamas	6	7.6	11.4	8
LaDee Flats	1996	NF Clackamas	7	11.4	12.3	4
LaDee Flats	1995	Winslow	1	0	0.5	17
LaDee Flats	1995	Winslow	2	0.5	0.7	3
LaDee Flats	***1995***	***Winslow***	***3***	***0.7***	***2.5***	***23***
McCubbins	***1997***	***Frog***	***1***	***0***	***2.5***	***29***
McCubbins	***1997***	***Frog***	***2***	***2.5***	***4.8***	***46***
McCubbins	***1997***	***Frog***	***3***	***4.8***	***6.2***	***49***
McCubbins	***1997***	***Frog***	***4***	***6.2***	***7.8***	***40***
Peavine	1996	Pinhead	1	0	2.8	16
Peavine	***1996***	***Pinhead***	***2***	***2.8***	***3.6***	***23***
Peavine	1996	Pinhead	3	3.6	6.2	18
Peavine	***1996***	***Pinhead***	***4***	***6.2***	***7.1***	***30***
Peavine	***1996***	***Pinhead***	***5***	***7.1***	***7.4***	***33***
Peavine	1997	Upper Clackamas	3	16.8	17.4	8

Table 3-73. (continued)

OHV Location	Survey Year	Stream Name	Reach	Begin Mile	End Mile	Fines <1 mm (%)
Peavine	1997	Upper Clackamas	4	17.4	19.8	6
Peavine	1997	Upper Clackamas	5	19.8	20.8	1
Peavine	1997	Upper Clackamas	6	20.8	22	9
Peavine	***1997***	***Upper Clackamas***	***7***	***22***	***23.4***	***24***
Peavine	1997	Upper Clackamas	8	23.4	24.5	11
Rock Creek	***1998***	***Rock Creek***	***NA***	***RM 9.2***		***24****

*This value is not directly comparable to others in the table as the survey included pool habitat (other surveys sampled only riffles and pool tails). As such the percent fines in spawning habitat is likely less that 24%; however, this is the only data available for streams in the proposed Rock Creek OHV location.

Pool Quality

Pool quality is not a measured attribute for stream surveys on the Forest. In the context of this analysis, potential effects to pool quality refers to the potential for increased amounts of fine sediment resulting from proposed activities that could decrease pool volume. There are no current measures of pool volume to compare to, so the effects analysis will discuss the potential for pool volume reduction resulting from OHV use.

Water Chemistry (Chemical Contamination/Nutrients)

There are no known streams or stream reaches within the Forest that are impaired for water chemistry (in this context water chemistry refers to the presence of toxic material, primarily petrochemicals or fecal coliform bacteria). Mining utilizing cyanide leach methods has not occurred in the Forest. As such, surface waters do not contain large amounts of chemicals and there are no areas with long standing chemical sources leading to degraded conditions for aquatic organisms.

Connectivity/Physical Barriers

Connectivity from an aquatic species context relates primarily to the presence of human-made barriers that preclude or limit up and downstream migration of aquatic fauna. On the Forest the most prevalent human-made barriers are road culverts, although irrigation diversions are often barriers as well. The Forest conducted a comprehensive fish passage survey on culverts across the Forest in 1999 and 2000 (Asbridge et al. 2001). Over 80 percent of surveyed culverts were rated as fish passage barriers. However, since 2000 most of the high priority culverts (i.e., those culverts in streams supporting anadromous fish or bull trout) have been removed or replaced with “fish-friendly” crossings. Numerous resident fish culvert barriers remain in virtually all watersheds across the Forest.

3.4.2. Effects Analysis

Alternative 1 – No Action Alternative

Fine Sediment and Substrate

Current OHV use is located in nearly every fifth-field watershed on the Forest. The current motor vehicle use policy for the Forest allows motor vehicles to venture off of roads and trails in areas that have not been specifically closed to such use. At present approximately 394,886 acres are open for OHV travel on the Forest with restrictions to avoid sensitive areas. There is no reasonable methodology to quantify location and impacts on hundreds of thousands of acres open to OHV use.

As noted in the Water Quality and Soils Sections, there is a potential to increase erosion and sedimentation in these areas due to lack of project design criteria in locations, such as uncontrolled stream crossings. The lack of staging areas affects current conditions. For example, the Soils Section describes how the LaDee Flats location is lacking a staging area and associated enforcement results in spontaneous parking at wide pullouts along roads. This results in chronic mudding in ditchlines, resulting in increasing risk of sediment transport to streams.

It has been well documented that OHV use can result in bare ground and increase soil erosion rates. As described in the Water Quality Report, the closer a disturbance is to surface water, the higher the risk of sediment delivery to that waterbody. In general, erosion rates decrease over time for a given area since the soil becomes compacted and "hardened" (Soils Section). Although erosion does not stop completely, new roads/trails are more likely to contribute higher levels of fine sediment to water bodies than established roads/trails. Distance from water also plays a large role in determining the actual amount of eroded sediment reaching a given water body. As discussed in the Water Quality Section, available literature indicates vegetated buffer widths ranging from 30 to 100 feet can effectively capture eroded sediment before it enters the nearest water body.

The majority of OHV routes currently open on the Forest are roads, both gravel and native surface (approximately 2,463 miles of roads permit OHV use). Few designated trails systems are currently open to OHV use (approximately 49 miles of motorized trails). The road/trail surface (bare soil or gravel) and road/trail width largely determines the erosion potential regardless of whether a route is a road or a trail (see WEPP example in the following section). Native surface roads/trails are more prone to erosion and thus potentially contribute more sediment to streams and other water bodies. Road/trail length adjacent to or near water, slope and soil type all affect the erosion potential as well.

There are approximately 2071 existing road and motorized trail routes greater than 100 feet distant from streams that permit OHVs, and there are approximately 179 miles within 100 feet of surface water on the Forest (Table 3-74)[4]. Of the roads/trails within 100 feet of streams, approximately 70 percent are within 100 feet of intermittent streams. Intermittent streams on the Forest generally do not harbor aquatic fauna, although seasonal use may occur by more mobile species, especially fish. However, based on known and suspected fish distribution very few intermittent streams on Forest are inhabited by fish. About 21 percent (44.5 miles) of existing roads/trails are within 100 feet of fish bearing stream reaches (Table 3-75). Existing roads/trails within 100 feet of perennial and/or fish bearing streams pose the greatest risk of fine sediment contribution to such streams and thus the greatest risk of impact to aquatic fauna and their habitat.

Table 3-74. Miles of OHV roads/trails within 100 feet of streams, grouped by intermittent (I) and perennial (P) flow regime, within the Mt. Hood National Forest for all alternatives addressed in this EIS.

Alternative	Flow Regime	Roads	Trails - Existing	Trails - New	Total
Alternative 1	I	132.9	2.6	0.0	135.5
	P	65.6	0.6	0.0	66.2
Alternative 2	I	3.7	1.8	0.9	6.4
	P	1.7	0.4	0.6	2.7
Alternative 3	I	8.1	1.8	0.8	10.7
	P	3.4	0.4	0.3	4.1
Alternative 4	I	1.1	1.5	0.1	2.7
	P	0.7	0.4	0.0	1.1

Alt 1 lakes = 1.0 mi
Alt 2 lakes = 0.05 mi

4 Information summarized in Table 3-73 and subsequent tables in Section 3.4 are based on the most up to date geographic information available. However, many attributes, such as perennial or intermittent stream flow, has not been field verified across the Forest.

Table 3-75. Miles of OHV roads/trails within 100 of streams, grouped by fish and non-fish bearing designation, within the Mt. Hood National Forest for all alternatives addressed in this EIS.

Alternative	Fish Bearing	Roads	Trails - Existing	Trails - New	Total
Alternative 1	Y	43.2	0.6	0.0	43.8
	N	157.2	2.6	0.0	159.8
Alternative 2	Y	1.1	0.4	0.1	1.6
	N	4.4	1.8	1.4	7.6
Alternative 3	Y	2.0	0.04	0.4	2.4
	N	9.5	1.8	1.1	12.4
Alternative 4	Y	0.3	0.4	0.0	0.7
	N	1.5	1.5	0.1	3.1

Increased erosion and sedimentation can result from roads/trails close to water bodies, but it is road/trail crossings over streams (or other surface waters) that pose the greatest risk of fine sediment input. The probability of sections of road or trail adjacent to crossings to transport eroded material directly to the crossing and thus into the water body is dependent on slope of approaches, road or trail surface material and vegetative cover between the road or trail and the stream. Fords would be of greater impact than bridges or culverts. There are over 3,000 crossings on existing open roads/trails within the Forest (Tables 3-76 and 3-77). Most are associated with roads, cross intermittent streams, and cross more non-fish bearing streams than fish bearing streams.

Table 3-76. OHV road/trail stream crossings, grouped by intermittent (I) and perennial (P) flow regime, within the Mt. Hood National Forest for all alternatives addressed in this EIS.

Alternative	Flow Regime	Roads	Trails - Existing	Trails - New	Total
Alternative 1	I	2863	25	0	2888
	P	975	4	0	979
Alternative 2	I	45	18	12	75
	P	14	4	8	26
Alternative 3	I	91	19	11	121
	P	31	4	5	40
Alternative 4	I	17	15	0	32
	P	10	4	0	14

Alt 4 – four crossings over lakes
Alt 2 – one crossing over a lake

Table 3-77. OHV road/trail stream crossings, grouped by fish and non-fish bearing designation, within the Mt. Hood National Forest for all alternatives addressed in this EIS.

Alternative	Fish Bearing	Roads	Trails - Existing	Trails - New	Total
Alternative 1	Y	431	4	0	435
	N	2342	25	0	2367
Alternative 2	Y	7	4	1	12
	N	53	18	19	90
Alternative 3	Y	17	4	1	22
	N	105	19	15	139
Alternative 4	Y	4	4	0	8
	N	23	15	0	38

Whether a road/trail crossing over a stream would actively contribute sediment or not depends on many of the factors described above. The WEPP model runs outlined in the Water Quality Section clearly indicate more sediment is generated from wider roads/trails and native surface roads/trails compared to graveled roads. Not all eroded sediment would make its way into area streams. Direct routing of sediment would be most likely from road/trail crossings as described above. To further illustrate this interaction a stream crossing was modeled with WEPP. The following describes the model assumptions and then results are presented.

WEPP Run - McCubbins Gulch Location – A new class III ford trail crossing on high erosion potential 351 soil using Hood River Weather Bureau Station precipitation data. The trail is outsloped and rutted, is a six foot wide tread with 25 feet of trail running directly into the surface drainage. It is a native surface trail. Note that any predicted runoff or erosion value--by any model--will be, at best, within plus or minus 50 percent of the true value. Erosion rates are highly variable, and the models predict only a single value. Replicated research has shown that observed erosion values vary widely for identical plots, and for the same plot from year to year (Elliot and others 1994; Elliot and others 1995; Tysdal and others 1999).

The lower the approach slope to the stream crossing the less sediment was delivered to the stream to the crossing (Table 3-78). Note that the pounds of sediment delivered are for an entire year and apply to only one side of the stream. For example, with a trail approach gradient of eight percent the pounds of soils delivered to the stream from one side of the crossing is 1.33 pounds – the total pounds delivered would be twice that, or 2.66 pounds.

Table 3-78. Estimated amounts of soil delivered to a stream from a ford in the McCubbins Gulch location based on varying trail approach gradients. The pounds delivered are for an entire year and only take into account one side of the crossing.

Trail Gradient (%)	Estimated Soil Delivered to Stream (lbs)
4	0.84
6	1.07
8	1.33
10	1.59
12	1.75
14	2.02

The above scenario reflects a “worse case situation” because the trail is native surface and the crossing is a ford. A bridge or culvert crossing would have less soil delivered because the road/trail would not empty directly into the stream. Likewise, a gravel road or narrower trail would contribute less sediment. The only situation that could be worse is a native surface road approximately 13 feet wide draining into the stream.

The following illustrates how much sediment is actually delivered to a stream using the WEPP modeling results presented in Table 3-78. A cubic yard of soil (27 cubic feet) weighs roughly 2000 pounds (John Dodd, Soil Scientist, Mt. Hood National Forest, personnel communication, December 2008). Therefore, a cubic foot of soil weighs approximately 75 pounds and a typical wheelbarrow holds from four to six cubic feet of soil (300-450 pounds). The maximum amount of sediment delivered to the stream at the modeled site would be four pounds per year at 14 percent approach gradient. As such, the soil generated from the above estimate is only 1.3 percent of the capacity of a four cubic yard wheelbarrow, or less than 1/15th of a cubic foot. Thus, the amount of sediment one can expect from a highly erosive soil type from a typical trail approach is a small amount on a yearly basis. However, in streams with a large number of crossings and/or trail segments adjacent to the stream for long lengths to amount of sedimentation into the stream could be large over time. Of course large storm events with a high amount of precipitation could result in accelerated erosion rates compared to those listed above.

Fine Sediment Impacts to Fish and other Aquatic Fauna

Fine sediment can impact aquatic creatures directly or indirectly depending on the location of the sediment source in relation to aquatic life, amount of sedimentation, and timing of sedimentation. Direct impacts to aquatic fauna from increased sedimentation could occur in two ways – increased turbidity that could affect feeding or other behavior and the actual smothering of individuals if enough sediment is deposited in the stream where fauna live. Indirect effects are possible if sediment fills pools and reduces living space (discussed separately, below), decreases food availability, and covers fish spawning areas thereby reducing spawning success. All of these elements will be discussed in the following pages.

Turbidity

Increases in turbidity could affect fish by reducing feeding, stimulating movement out of the area, respiratory impairment, increasing stress, and reducing tolerance to disease (Waters 1995). Sigler et al. (1984) found steelhead trout and coho salmon growth rates decreased in turbid water with as little as 25 NTU measured turbidity over test periods ranging from 14-31 days. Visual impairment is likely the most common reason for reduced feeding rates and thus reduced growth rates. They also noted there was more fish emigration from tanks with turbid water compared to tanks with clear water. They speculated that salmonids emerging from the gravel would likely emigrate quickly if turbid conditions were encountered. In fact, Waters (1995) states that behavioral avoidance of turbid water may be one of the most important sub-lethal effects of turbidity. Direct mortality as a result of increased turbidity levels is possible but unlikely. Sigler et al. (1984) reported some mortality of very young coho and steelhead fry and turbidities ranging from 500 – 1500 mg/L; however, McLeay et al. (1983) found little mortality of arctic grayling under yearlings subject to prolonged exposure to concentrations around 1000 mg/L.

The effect of increased turbidity on aquatic macroinvertebrates is likely similar to those described for fish, at least for aquatic insects, but most of the literature focused on fine sediment deposition rather than suspended sediment. Waters (1995) postulates that prolonged episodes of turbidity may result in insect drift stimulation (i.e., emigration) that can reduce food supplies. The level of turbidity would have to be very high for very long however, and Waters admits that in streams with such a high turbidity load there could be as much or more affect on macroinvertebrates from deposited sediment. Effects on mollusks are not well documented, but given that preferred habitat characteristics include clean water it is assumed that long periods of high turbidity could be detrimental. Aldridge et al. (1987) found that feeding was impaired for three species of clams in laboratory experiments when sediment was added frequently to simulate suspended solids churned up by dredging. Given their lack of mobility it is conceivable that snails could respond in a similar manner.

Increased turbidity resulting from OHV use or other proposed activities would be limited both in space and time because of the small amounts of fine sediment introduced via erosion or other avenues. Increases in turbidity to levels discussed above are unlikely, and long durations of turbid conditions due solely to OHV related activities is not expected. Turbidity monitoring in streams below instream construction activities indicated turbidity increases were not be detectable 0.5 to 1 mile downstream of the worksite (Bengt Coffin, hydrologist, Gifford Pinchot National Forest, personal communication, 2009). Increased turbidity resulting from OHV use or road/trail erosion would much less than that associated with instream construction activities so turbid conditions would not extend even 0.5 miles downstream.

The greatest impact to fish from increased turbidity resulting from OHV use or road/trail erosion would be avoidance. There would be little to no effect on fish respiration given the small amount of suspended sediment and short duration. Impacts to feeding could occur, but unless the turbidity event was prolonged this would be a slight effect that could be “mitigated” to some degree by fish moving out of the area. Overall, the impact on fish from increased turbidity is expected to be negligible. The impact on aquatic invertebrates would be minimal although slightly impaired feeding and possibly respiration are possible, especially near sources. Increased turbidity has little to no effect on habitat conditions.

Sedimentation

The deposition of fine sediment on the streambed could negatively impact habitat conditions and subsequent survival and/or production for both fish and aquatic macroinvertebrates (Waters 1995). Direct effects of sediment deposition are unlikely, especially for juvenile and adult fish. Enough sediment would have to be deposited in a short period of time to bury individuals and either crush or suffocate them. Since adult and juvenile fish are mobile this is extremely unlikely unless there was a large debris torrent or some other event where the effects of OHV use on erosion rates would be insignificant in the larger context. Smothering of aquatic macroinvertebrates, especially snails or other relatively immobile creatures, is somewhat more likely although uncommon. The potential increase in insect drift resulting from increased sedimentation (Waters 1995) would alleviate to some degree the incidence of smothering.

It is anticipated that larger rain events that could produce larger volumes of fine sediment from existing roads/trails could bury some aquatic snails and possibly insects. However, tying this specifically to OHV use is difficult as many other vehicles use many of the roads/trails and road maintenance and repair also play a role in erosion susceptibility.

Indirect effects to both macroinvertebrates and fish from sedimentation are more likely and more common. The effect of fine sediment deposition on macroinvertebrate production, survival, and species composition is relatively well documented. Bjornn et al. (1974 and 1977) found riffles with the most sediment contained the lowest abundance of insects in Idaho streams but small amounts of sediment added to riffles in streams did not greatly affect abundance or drift. In laboratory studies they concluded that embeddedness levels more than one third around cobbles decreased insect abundance by over 50 percent, especially riffle- inhabiting taxa (e.g., stoneflies, mayflies, and caddisflies, which are most important as salmonid food). Other laboratory studies have supported these results (McClelland and Brusven 1980). The reduction in abundance associated with fine sediment appears to be related to respiration (Rutherford and Mackay 1986) and possibly the loss or reduction of organic detritus which is a source of food for macroinvertebrates (Culp et al. 1983). Most studies have focused on aquatic insects as these are more important as fish food, but it is likely that impacts to aquatic mollusks are similar.

It is unclear how much existing OHV road/trail related sedimentation has affected aquatic macroinvertebrates. Stream reaches directly below sediment sources are likely the most susceptible to impact for reasons given above. In many areas the sediment produced solely from OHV roads/trails may have little affect on macroinvertebrate abundance given the results in natural streams described by Bjornn et al. In streams where large amounts of fine sediment have been deposited both by natural and anthropogenic sources recolonization from upstream has occurred rapidly once conditions improved (Cline et al. 1982; DeWalt and Olive 1988; Tsui and McCart 1981). Therefore, episodic events such as large storms and construction projects may be less harmful over the long term compared to chronic sources of sediment.

Indirect effects of fine sediment deposition on fish and fish habitat, particularly salmonids, relates primarily to the following: reduction in the quantity and/or quality of spawning habitat for fish, reduction in food supply, reduction in fry survival in riffles, and reductions in living space (discussed separately below). The relationship between spawning success and fine sediment levels has been addressed in detail over the last 40+ years. Suffice it to say that the more fine sediment in spawning areas the lower the spawning success. Most research correlates the amount of fine sediment 0.84 mm or less with embryo survival (McNeil and Ahnell 1964; Hall 1986; Tagart 1984; Reiser and White 1988) and it is now common acceptance that when fines < 0.8 mm exceed 20 percent then significant embryo mortality could be expected (Waters 1995). Note that in many cases fine sediment increases are temporary, occur at times of the year other than spawning or egg incubation, and may be tempered by the act of spawning itself. When adults digs redds they clear much of the fine sediment from the area (Sheridan and McNeil 1968; Everest et al. 1987; Bjornn and Reiser 1991) and increase the chances for egg and embryo survival.

Reduction in food supply for salmonids, particularly riffle-dwelling insects, can be significantly impacted by surface and embedded sediment as described above. Reduction in food would lead to increases in competition, increased stress, decreased growth rates, and emigration from the area. The degree to which the above would occur depends on a variety of factors including the amount of sediment, overall productivity of a stream or reach, other water quality factors such as temperature or pollution, fish species present, and fish abundance prior to the sediment disturbance.

Salmonid fry spend some time throughout the year, much of it during the winter, living in the interstitial spaces between rocks, primarily cobble. Their survival can be reduced if the spaces between cobbles are filled with fine sediment because the actual living space is reduced and they are unable to utilize this protective habitat. Bustard and Narver (1975) found that sedimented substrates reduced winter survival of juvenile cutthroat trout. Similarly, Hillman et al. (1987) observed that age-0 Chinook salmon moved in the fall from areas where summer habitat was heavily sedimented; experimental additions of clean cobble the following year resulted in a fivefold increase in winter fry densities.

Fine Sediment Effects Summary

OHV use increases erosion rates which in turn could lead to increased sedimentation into streams or other water bodies. Although the sediment produced from any given crossing may be relatively small, the cumulative effect of many crossings and road/trail segments could contribute large amounts of fine sediment to water bodies. The fate of this fine sediment depends on precipitation, stream size, habitat conditions, and channel gradient, among other factors. It is difficult to determine how much sediment is related specifically to erosion from roads/trails used by OHV since many existing routes are multi-use roads that receive a large amount of traffic. It is also unknown how much OHV use is occurring in any given location.

Despite this uncertainty, it is safe to assume that exacerbated erosion rates in some locations have resulted in fine sediment levels that could impact fish and aquatic macroinvertebrate individuals and/or habitat. Most impacts are indirect and may affect spawning habitat and success, feeding, abundance, and over-wintering survival. With over 3,000 stream crossings open to OHV use, Alternative 1 has the greatest impact on fish and aquatic macroinvertebrates compared to other alternatives. Alternative 1 has the greatest risk for future impacts. Given that exact amounts of erosion and sedimentation are unknown, the discussion of effects for other alternatives will focus primarily on sedimentation risk compared to Alternative 1.

Pool Quality

Pool quality can be reduced by fine sediment deposition filling pools to varying degrees (Waters 1995). The frequency and magnitude of this would vary depending on road/trail location relative to a stream, level of OHV use, soil type, erosion rates, amount of fine sediment actually entering the stream, flow rates, channel gradient, and roughness elements (boulders, logs) that can slow water and trap sediment. As discussed above, pool quality is not measured during stream surveys on the Forest. Although studies can be conducted to measure the decrease in pool volume associated with the addition of fine sediment, there are no such studies on Forest related to OHV use.

OHV roads/trails and use would have no direct effect on pool quality unless OHVs are fording a creek in a pool. Although possible, professional experience shows that most fords are located at shallow stream sections, not in pools. The filling of pools would be an indirect effect from fine sediment entering streams via trail or bank erosion and some of that sediment settling in pools. If enough sediment is deposited, then pool volume can be appreciably reduced. A reduction in pool volume effectively reduces the available area for fish to live, especially during low flow periods. Reduced pool volume by one half was shown to decrease small salmonid numbers by two thirds in an Idaho study (Bjornn et al. 1977). Reduced living space can result in increased competition for space, increased competition for food and a subsequent lowered capacity for a given stream or stream section to support a healthy population of fish.

Although the filling of pools can happen resulting from OHV use, the scope and degree of pool quality reductions are likely localized near erosion prone stream crossings. Riedel (2006) found that sedimentation downstream of an OHV ford occurred in pulses associated with rain events. He noted that runoff from individual rain events washed new sediment into the stream while sediment deposited from previous events was washed downstream. Therefore, although a particular OHV crossing can contribute sediment to a stream the amount of sediment may stay at relatively constant levels instead of continually building up and significantly filling pools. Given the low amounts of sediment contributed from a modeled ford on a yearly basis it is unlikely pools would be filled to any great degree below such a crossing. Riedel (2006) also found that the sediment from the crossing was flushed away quickly below the confluence with a tributary about 85 meters downstream. This is not meant to downplay the potential deleterious effects of fine sediment deposition on pool quality, but only to illustrate that it is unlikely for sediment from a stream crossing to significantly fill downstream pools.

To summarize, it is likely that existing OHV use has caused some pool quality degradation in streams on the Forest. The location and degree of this degradation are unknown and thus the impact on salmonid and aquatic macroinvertebrate populations, although probable at least in some locations, is also unknown. Impacts have the greatest potential to occur near existing crossings, as sediment routed downstream would be deposited and diluted over time.

Water Chemistry

As described in the existing condition section above, there are no surface water bodies on the Forest subject to chronic water quality degradation due to contaminants. From an OHV perspective the potential primary sources of contaminants into water bodies would be petroleum based products such as gasoline and engine oil, and possibly fecal coliform bacteria. The fate and effect these substances would have on water quality and subsequently aquatic biota in the event of a spill would depend on a variety of factors including distance from surface water, soil type, aquatic biota present, and weather (e.g., precipitation).

It is safe to assume, however, that the most likely locations where contamination could occur are at parking areas (see the discussion of Shepp 1996 in the Water Quality Section). Spills would not be expected while driving either to the parking area or out on the trail and once at the parking area; vehicles parked for longer periods are less likely to discharge contaminants. Therefore, the highest likelihood of a spill or discharge at any parking area would be from the OHVs themselves as they could leave and return fairly frequently. One scenario likely to occur at OHV parking areas that was not addressed in a report by Crabtree (2004) addressing ski area parking lot runoff and effects on water quality and fisheries is refueling and light maintenance (adding oil, fixing a tire, etc.). These activities may very well have the highest likelihood of a spill compared to actual OHV operation.

There are no OHV staging areas currently designated on the Forest, although several areas are commonly used in this manner (McCubbins Gulch Campground for example). There have been no reported spills of petrochemicals associated with OHV use on the Forest. Unreported, accidental spills have likely occurred but there are no records and it is assumed the vast majority of spills would have been quite small for the following reasons:

- Most Forest recreation users respect the landscape and therefore the indiscriminate dumping of hazardous chemicals by OHV users is unlikely.
- Fuel, oil, and other fluids related to OHV use, including for transport vehicles, are valuable and people are not in the habit of wasting such material.

For this analysis it is assumed that across the Forest there is a low risk of spills at parking or staging areas. Most recreational OHV users do not carry extra fuel while riding and the chance that an OHV wreck or some other mishap would occur in or near a water body and result in a spill is extremely low.

If a spill were to occur the effect on the aquatic environment would vary depending on factors listed above but in most cases the effects would be minimal. Crabtree (2004) conducted an extensive literature search that summarized the fate and effect of a wide variety of petroleum chemicals on water quality and fisheries from a ski area parking lot. He determined the flushing of hydrocarbon toxins into a creek from a paved parking lot in concentrations that would have any biological effects were unlikely. The following summarizes his findings:

- Automotive (and OHV) fluids most likely to be flushed into the stream are lubricants, hydraulic fluids, and antifreeze.
- Lubricants and hydraulic fluids (except brake fluid) are composed of higher molecular weight hydrocarbons that are of low solubility and low toxicity to fish and other organisms.
- Antifreeze is of very low toxicity and short half-life in the aquatic environment. Brake fluid is probably similar to antifreeze in its biological effects.
- The most toxic automotive fluids are gasoline and diesel. The volatility of gasoline, and to a lesser extent, some components of diesel, would ensure that much of it evaporates before entering a stream.
- Only a small proportion of vehicles used for private transportation use diesel as a fuel, which makes leakage of diesel less likely.
- Runoff from parking lots would be episodic, with periods of no runoff alternating with periods of runoff. Fish would be exposed to (somewhat) elevated levels of hydrocarbons for a few hours or a few days, followed by days, weeks, or months with no exposure.

That Crabtree's analysis focused on a paved parking lot is important to note as most, if not all, existing OHV parking areas on the Forest are either native surface or gravel. As such spilled material would infiltrate the soil which would bind and hold the petroleum products. Some movement would occur but compared to a paved lot the amount reaching streams would be much less and metered over a much longer period of time.

To summarize the above, there would be no direct effect from a petroleum product spill to aquatic organisms unless a spill was to occur directly into a stream or other waterbody harboring aquatic organisms. This would only occur at fords crossing such waterbodies. It is unknown how many such fords there are on the Forest but some are known to exist in the McCubbins Gulch location and on the Rho Ridge trail in the Graham Pass location (the latter are all non-fish bearing). It is likely others are present but not documented. The most highly toxic materials are gasoline and diesel so the most damage would occur if one or the other of these two materials was spilled; some mortality or sub-lethal effects may occur. Lubricants and antifreeze have a much lower toxicity and their low solubility would inhibit mixing, i.e., they would float. Indirect effects from a spill away from water are unlikely given the reasons listed above.

Contamination of surface waters by fecal coliform bacteria associated with intensive recreational use is possible if toilet facilities are not available. Although the call of nature could happen anywhere it is the concentrated use of an area near water that could have the greatest potential effects on water quality. Available evidence indicates recreational use in watersheds does not always result in water quality degradation (Lee et al. 1970, as cited in Varness et al. 1978), especially if sanitary facilities are present (Aukerman and Springer 1976, as cited in Varness et al. 1978). However, Varness et al. (1978) found that fecal coliform indicator species densities increased in flowing surface waters near areas of heavy motorized camping without sanitation facilities, especially on weekends. Bacterial water quality degradation in impounded surface waters has also been evident in some areas (Dietrich and Mulamoottil 1974; Wagenet and Lawrence 1974, both as cited in Varness et al. 1978). The impact on bacterial water quality from OHV recreational activities is unknown, but possible degradation could exist in areas of concentrated use without sanitary facilities. The degree of impact would depend on the level of use and proximity to water – direct effects are unlikely as this would imply contamination directly into a water body.

Connectivity

Under the no action alternative there would be a neutral effect to connectivity for aquatic species associated with road and/or trail crossings. Over 250 culverts were rated as fish passage barriers on the Forest in 1999 and 2000 (Asbridge et al. 2001). However, OHV use in and of itself has no direct or indirect effect on fish or other aquatic fauna passage since existing routes utilize roads and trails built, in most cases, years ago. Most roads were built for timber sale purposes and at the time fish passage at crossings was not a consideration. Even at existing fords passage is possible, although it is conceivable aquatic fauna migration could be delayed for short periods when OHVs are crossing these streams.

Disturbance

To be a direct effect from disturbance, there would have to be an immediate impact that would harm aquatic species. Most OHV crossing streams are on roads or trails with culverts or bridges and direct disturbance at these locations is unlikely. The direct disturbance of aquatic fauna could occur at fords crossing flowing streams or other water bodies where aquatic fauna are present. As mentioned above the location of all OHV related fords in perennial streams across the Forest are unknown. At least one is present in McCubbins Gulch which harbors redband trout and possibly Regional Forester's Special Status macroinvertebrates. Another is present in Ramsey Creek on the Barlow Ranger District. This stream is inhabited by federally threatened steelhead trout among other species. Others are present on the Rho Ridge trail (trail 564) but these are all non-fish bearing. Additional fords are certainly present but locations are largely unknown. They likely occur on smaller streams and wetlands; larger streams and ponds/lakes would be relatively unaffected. Disturbance from OHV use and bridge or other crossing and trails adjacent to streams is minimal.

Disturbance effects range from individual injury or death to relocation away from the area. OHVs crossing streams could run over individuals, especially macroinvertebrates that cannot move fast. Fish would have an easier time getting away. In some cases salmonid redds (egg nests) could be run over causing egg and/or sac fry mortality or injury. The extent and duration of this type of disturbance has not been quantified but given known ford locations and the presence other fords it does occur.

Summary of Direct and Indirect Effects for Alternative 1

Alternative 1 would allow continued use on approximately 394,886 acres for overland OHV travel and over 3,000 stream crossings open to OHV use. Although it is required for OHV users to avoid sensitive areas, it is difficult to regulate, and field observations have found impacts from unregulated use across the Forest. No project design criteria would be enacted to reduce and minimize OVH impacts. Although it is difficult to quantify, it is reasonable to conclude that under this alternative, exacerbated introduction of fine sediments to waterways would continue to cause the greatest negative impact to aquatic species. There would continue to be direct habitat and aquatic fauna disturbance at fords. There would be continued adverse effects to ESA listed species and their critical habitat.

Cumulative Effects for Alternative 1

A full description of cumulative effects for all alternatives is found in Table 3-79. Findings relevant to aquatic fauna and habitat are summarized below.

Fine Sediment

There is a probability of cumulative effects to aquatic habitat from sediment associated with vegetation treatments, road and trail maintenance, invasive plant treatments and aquatic restoration overlapping with effects from OHV use allowed in Alternative 1.

Disturbance

There is a probability of cumulative effects to aquatic fauna from treatment of invasive plants as some treatment may require wading or boating in waterways as well as OHV use near streams.

Table 3-79. Summary of cumulative effects to aquatic fauna and habitat for all alternatives. Effects are based on description in the column titled "Extent, Detectable?"

Project	Potential Effects	Overlap in		Measurable Cumulative Effect?	Extent, Detectable?	Aquatic Species and Stream Habitat Effects
		Time	Space			
Existing Old Forest Service Timber Harvest Units	Suspended Sediment	No	Yes	No	Projects are completed. No remaining sediment effects due to mitigation measures and design criteria implementation on the original projects and natural recovery.	None
Forest Service Vegetation Treatment Activities Planned or Underway (The Dalles Watershed Fuelbreak, North Fork Mill Restoration Project, Sportsman's Park Hazardous Fuels Reduction, No Whisky Plantation thinning, Upper Clackamas Plantation Thinning, Cascade Crest Fuel Break Project, Pre-commercial treatments)	Suspended Sediment	Yes	Yes	Yes	There may be an overlap in timing and location of these projects with the OHV project; these projects have a chance of some short-term introduction of fine sediment that may mix with fine sediment from the OHV project. Some of the high risk areas would be in Neal Creek and West Fork Neal Creek due to North Fork Mill Restoration Project culvert replacements, road reconstruction on the 1700 road, OHV use on Hood River County lands, existing Long Prairie Grazing Allotment damage and timber harvest on private lands. Other listed projects have a low risk of cumulative effects due to implementation of mitigation and project design criteria that minimize erosion and sediment input.	Potential for cumulative effects to fish is expected to be localized with a potential for some sediment avoidance behavior. Aquatic invertebrate species may have low levels of short-term negative stream conditions. Except for culvert replacements and some road reconstruction, mitigation measures reduce the amount of sediment delivered to streams and affecting aquatic resources to a level that is not measurable and is insignificant, and have a low risk of cumulative effects. Culvert replacements and road reconstruction adjacent to streams have a higher potential to deliver sediment to streams. For example, in Neal Creek and West Fork Neal Creek the North Fork Mill Restoration Project culvert replacements sediments could mix with the OHV project and affect steelhead and resident trout.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to mitigation measures and design criteria implementation, conformance with existing standards and guidelines on the existing projects.	None
	Air Quality	Yes	Yes	Not Measurable	Fugitive dust and exhaust emissions from OHV use have a chance of mixing with dust and emissions from equipment associated with vegetation treatments. The most likely effect is mixing of dust on existing road systems from equipment using these roads. The cumulative effect is not expected to be measurable.	None

Table 3-79. (continued)

Project	Potential Effects	Overlap in		Measurable Cumulative Effect?	Extent, Detectable?	Aquatic Species and Stream Habitat Effects
		Time	Space			
Private Land Activities (SDS Timber Harvest, City of The Dalles Timber Harvest, Hood River County Trails Project)	Suspended Sediment	Yes	Yes	Yes	Some projects are completed so there are no remaining sediment effects due to natural recovery. Other ongoing projects on adjacent private land such as road maintenance and vegetation manipulation have a chance of some short-term introduction of fine sediment that may mix with minor fine sediment from the OHV project. Some of the high risk areas would be in Neal Creek and West Fork Neal Creek due to North Fork Mill Restoration Project culvert replacements, road reconstruction on the 1700 road, OHV use on Hood River County lands, existing Long Prairie Grazing Allotment damage and timber harvest on private lands.	There may be an overlap in timing and location of these projects with the OHV project. It is expected that levels of sediment from National Forest lands would be at extremely low levels, but could mix with sediment produced from private land activities. Effects to aquatic species would depend on the amount of sediment generated from private land activities and transported to streams with aquatic species.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to mitigation measures and design criteria implementation, conformance with existing standards and guidelines on the existing projects.	None
Misc. Tree Salvage (Hazard Trees)	Suspended Sediment	Yes	Yes	Not Measurable	There may be an overlap in timing of this project with the OHV project; any minor suspended sediment would not be measurable due to implementation of mitigation measures and design criteria and conformance with existing standards and guidelines in the projects.	Any cumulative effect would be of minor magnitude due to the localized, minor impact of miscellaneous tree salvage when overlapped with effects of the OHV project. Any effects to aquatics would be minor and not be measurable.
Long Prairie Grazing Allotment	Suspended Sediment	Yes	Yes	Yes	Current damage in riparian areas from grazing has a chance of some short-term introduction of fine sediment that may mix with minor fine sediment from the OHV project. The highest risk of this would be in West Fork Neal Creek due to the culvert replacement projects, road reconstruction on the 1700 road, Long Prairie Grazing allotment, OHV use on Hood River County lands and timber harvest on private lands. Long-term restoration of a more natural sediment regime is likely with recovery due to mitigation measures and design criteria in the Long Prairie Grazing Allotment project coupled with road decommissioning, culvert removal/ replacement and road closures associated with the North Fork Mill Restoration Project.	Potential for cumulative effects to fish is expected to be localized with a potential for some sediment avoidance behavior. Aquatic invertebrate species may have low levels of short-term negative stream conditions.

Table 3-79. (continued)

Project	Potential Effects	Overlap in		Measurable Cumulative Effect?	Extent, Detectable?	Aquatic Species and Stream Habitat Effects
		Time	Space			
Ongoing road and trail maintenance	Suspended Sediment	Yes	Yes	Yes	There may be an overlap in timing and location of these projects with the OHV project; these projects have a chance of some short-term introduction of fine sediment that may mix with fine sediment from the OHV project. Some of the high risk areas would be in Neal Creek and West Fork Neal Creek due to North Fork Mill Restoration Project culvert replacements, road reconstruction on the 1700 road, OHV use on Hood River County lands, existing Long Prairie Grazing Allotment damage and timber harvest on private lands. Other areas of potential concern include McCubbins Gulch and Cabin Creek in the Peavine OHV location due to the number of OHV stream crossings and native surface roads.	Potential for cumulative effects to fish is expected to be localized with a potential for some sediment avoidance behavior. Aquatic invertebrate species may have low levels of short-term negative stream conditions.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to mitigation measures and design criteria implementation, conformance with existing standards and guidelines on the existing projects.	None
	Air Quality	Yes	Yes	Not Measurable	Fugitive dust and exhaust emissions from OHV use have a chance of mixing with dust and emissions from road maintenance equipment. The most likely effect is mixing of dust on existing road systems. The cumulative effect is not expected to be measurable.	None

Table 3-79. (continued)

Project	Potential Effects	Overlap in Time	Overlap in Space	Measurable Cumulative Effect?	Extent, Detectable?	Aquatic Species and Stream Habitat Effects
Invasive Plant Treatments	Suspended Sediment	Yes	Yes	Not Measurable	There may be an overlap in timing of this project with the OHV project; any minor suspended sediment would not be measurable due to implementation of mitigation measures and design criteria and conformance with existing standards and guidelines in the projects.	There may be an overlap in timing of this project with the OHV project, in addition to the effects described at left, there is a small probability sediment delivered and transported from invasive plant treatments such as knotweed removal resulting in bare ground could overlap with OHV generated sediment; due to the minor, localized knotweed populations sediment levels would not exceed the levels described at left.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to mitigation measures and design criteria implementation, conformance with existing standards and guidelines on the existing projects.	None
	Disturbance of Aquatic Species	Yes	Yes	No		Treatment of invasive plants may require wading or boating in waterways. There may be an overlap in timing of this project with the OHV project. Disturbance from invasive plant treatments is expected to localized and minor, and not have any measurable cumulative effect.
Past Aquatic Restoration Projects	Suspended Sediment	No	Yes	Not Measurable	There may be an overlap in timing of these project effects with the OHV project. Any minor suspended sediment may slightly slow the recovery resulting from restoration project implementation, but this would not be measurable due to implementation of mitigation measures and design criteria and conformance with existing standards and guidelines in the projects.	Cumulative effects to streams are described in the column on the left. Potential for cumulative effects to fish is expected to be localized with a potential for some sediment avoidance behavior. Aquatic invertebrate species may have low levels of short-term negative stream conditions.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to mitigation measures and design criteria implementation, conformance with existing standards and guidelines on the existing projects.	None

Table 3-79. (continued)

Project	Potential Effects	Overlap in Time	Overlap in Space	Measurable Cumulative Effect?	Extent, Detectable?	Aquatic Species and Stream Habitat Effects
Clackamas Road Decommissioning	Suspended Sediment	Yes	Yes	Not Measurable	There may be a spatial and temporal overlap of effects of this project with the OHV project. Any minor suspended sediment may slightly slow the recovery resulting from restoration project implementation but this would not be measurable due to implementation of mitigation measures and design criteria and conformance with existing standards and guidelines in all projects on National Forest.	Potential for cumulative effects to fish is expected to be localized with a potential for some sediment avoidance behavior. Aquatic invertebrate species may have low levels of short-term negative stream conditions.
Future Aquatic Restoration Projects	Suspended Sediment	Yes	Yes	Not Measurable	There may be a spatial overlap of these project effects with the OHV project. Any minor suspended sediment may slightly slow the recovery resulting from restoration project implementation but this would not be measurable due to implementation of mitigation measures and design criteria and conformance with existing standards and guidelines in all projects on National Forest.	Potential for cumulative effects to fish is expected to be localized with a potential for some sediment avoidance behavior. Aquatic invertebrate species may have low levels of short-term negative stream conditions.
	OHV Related Chemicals	Yes	Yes	No	No cumulative effects are expected due to mitigation measures and design criteria implementation, conformance with existing standards and guidelines on the existing projects.	None

Alternative 2 – Proposed Action

Alternative 2 proposes to establish a series of OHV trails utilizing the existing road network, the existing motorized trail network and construction of new motorized trails. Staging areas would be built or improved and provide loading, unloading, parking and restrooms. Overland travel would not be allowed. In addition, some existing roads would be decommissioned as part of this alternative. Following is a description of each of the trail treatments and the resulting relative change in erosion and sedimentation from Alternative 1. This analysis tiers to the Water Quality and Soils Sections.

Fine Sediment

Compared to Alternative 1 the proposed open OHV roads are significantly less in Alternative 2 (approximately 224 miles of road). Road/trail length within 100 feet of surface water is significantly less in this alternative, approximately 23 times less. Similarly, stream crossings are also reduced by about 30 times. As in Alternative 1, most roads/trails within 100 feet of streams and streams crossings are associated with intermittent, non-fish bearing streams. Alternative 2 also proposes to decommission about 0.6 miles of road within 100 feet of streams (Table 3-80) with seven crossings (i.e., culverts) removed, one of them fish bearing (Table 3-81). The net result of this proposal would be a very large reduction in the risk of erosion and resultant sedimentation compared to Alternative 1 across the Forest.

Table 3-80. Roads within 100 feet of water bodies proposed for decommissioning for all action alternatives. No road decommissioning is proposed in the Bear Creek, Gibson Prairie, Graham Pass, Mt. Defiance, and Rock Creek location.

OHV Location	Fish Bearing	Alternative 2	Alternative 3	Alternative 4
LaDee Flats	Y			
	N	0.2	0.2	0.2
McCubbins Gulch	Y	0.0	0.1	0.1
	N	0.3	0.5	0.3
Peavine	Y		0.1	
	N	0.2	0.6	
Total		**0.6**	**1.5**	**0.7**

Table 3-81. The number of stream crossings on roads proposed for decommissioning for all action alternatives. No road decommissioning is proposed in the Bear Creek, Gibson Prairie, Graham Pass, Mt. Defiance, and Rock Creek locations.

OHV Location	Fish Bearing	Alternative 2	Alternative 3	Alternative 4
LaDee Flats	Y			
	N	3	3	3
McCubbins Gulch	Y	1	1	1
	N	1	7	3
Peavine	Y		2	
	N	2	8	
Total		**7**	**21**	**7**

There are six proposed OHV locations in this alternative. Most of the proposed roads/trails are existing roads (some of which would be converted to trails), followed by existing trails and then new trails. Focusing on roads/trails within 100 feet of surface water (including intermittent streams), McCubbins Gulch has the most proposed road/trail length (3.7 miles) followed by the Peavine and LaDee Flat locations (Table 3-82). Most roads/trails are adjacent to non-fish bearing streams so erosion and potential sedimentation would pose a greater risk to aquatic macroinvertebrates than fish, although some risk remains. Impacts to fish from road/trail erosion would be greatest in the McCubbins Gulch location where there are no ESA listed fish species or ESA critical habitat but redband trout, a Regional Forester's Special Status Species, are known to reside. Other proposed locations have very few roads/trails near fish bearing streams.

Table 3-82. Proposed OHV road and trail lengths (in miles) within 100 feet of surface water for each of the proposed OHV locations in Alternative 2. For each location the information is grouped by fish bearing or non-fish bearing water body.

OHV Location	Fish Bearing	Roads	Trails - Existing	Trails - New	Grand Total
Bear Creek	Y			0.0	0.0
	N			0.8	0.8
Gibson Prairie	Y	0.1			0.1
	N	0.2		0.0	0.2
LaDee Flats	Y	0.1			0.1
	N	1.1			1.1
McCubbins	Y	0.7	0.4		1.1
	N	0.6	1.8	0.2	2.6
Peavine	Y	0.2		0.1	0.2
	N	1.9		0.3	2.2
Rock Creek	Y	0.0		0.0	0.1
	N	0.7		0.0	0.8
Total Fish Bearing		1.1	0.4	0.1	1.6
Total Non-fish		4.4	1.8	1.4	7.6
Grand Total		**5.5**	**2.2**	**1.5**	**9.3**

As described above, the greatest potential for increased sedimentation into surface water is at stream crossings. Most road/trail crossings proposed in Alternative 2 are over intermittent streams (Table 3-83) compared to perennial streams (Table 3-84). To better estimate effects from proposed crossings from an erosion and sedimentation perspective, native surface crossings (those most prone to erosion) were further grouped into high, moderate, and low erosion risk categories (see Water Quality Section for more detail). Regardless of flow regime, most crossings fall into the "non-native" (generally gravel) erosion risk classification. These crossings are not erosion free, but are at a lower risk of erosion than native surface crossings. Of the native surface crossings relatively few are at a high risk of erosion and the vast majority of those are existing trails over intermittent streams in the McCubbins Gulch location. These high erosion risk crossings in the McCubbins Gulch location are those best represented by WEPP modeling presented above. Other crossings in the moderate to low category would be expected to contribute less sediment to streams.

Table 3-83. Total number of intermittent stream crossings associated with roads/trails proposed in Alternative 2 for each OHV location. Non-native erosion risk refers to non-native surface roads which are less prone to erosion than native surface roads and trails. Numbers in parentheses are crossings over fish bearing streams. (Total fish bearing crossings = 1)

OHV Location	Erosion Risk	Roads	Trails - Existing	Trails - New	Grand Total
Bear Creek	Moderate			6	6
Gibson Prairie	Moderate	1		1(1)	2
LaDee Flats	Low	3			3
	Non-native	9			9
McCubbins Gulch	High		9		9
	Moderate	3	16	3	22
Peavine	Moderate	4		1	5
	Non-native	13		2	15
Rock Creek	Moderate	1			1
	Non-native	7			7
Grand Total		**41**	**25**	**13**	**79**

Table 3-84. Total number of perennial stream crossings associated with roads/trails proposed in Alternative 2 for each OHV location. Non-native erosion risk refers to non-native surface roads which are less prone to erosion than native surface roads and trails. Numbers in parentheses are crossings over fish bearing streams. (Total fish bearing crossings = 11)

OHV Location	Erosion Risk	Roads	Trails - Existing	Trails - New	Grand Total
Bear Creek	Low			1	1
	Moderate			6	6
Gibson Prairie	High	1(1)			1
LaDee Flats	Low	2			2
	Non-native	4(2)			4
McCubbins Gulch	High		1(1)		1
	Moderate		2(2)		2
	Non-native	2(1)			2
Peavine	Low	1(1)		1(1)	2
	Moderate	1(1)			1
Rock Creek	Moderate	1			1
	Non-native	3(1)			3
Grand Total		**15**	**3**	**8**	**26**

Of the 105 stream crossings, only 12 cross fish bearing streams. Only one known intermittent stream in the proposed locations is fish bearing – North Fork Mill Creek in the Gibson Prairie location (Table 3-83). Most crossings over fish bearing streams are roads (7), with three on existing trails and another two on proposed new trails. There are only two fish bearing crossings rated as high erosion risk – a road in Gibson Prairie (native surface road 1711630) and an existing trail in McCubbins Gulch (Table 3-84). Both are spanned by a bridge or culvert. Only one existing crossing over a fish bearing stream is a ford and that is located across McCubbins Gulch itself (rated as moderate erosion risk). As outlined in the PDC, this ford would be replaced with a bridge or culvert if this alternative is selected.

The 4230 road is a proposed OHV route within the Peavine OHV location. Some of this road is within the Pinhead Creek subwatershed where bull trout are proposed for reintroduction. However, the road lies a quarter mile or more from Pinhead Creek at its closest point with no direct drainage into the creek. OHV use on this road would not result in increased sedimentation into Pinhead Creek. One other proposed OHV road in the Peavine OHV location crosses Last Creek near the headwaters. This crossing is over two miles upstream of known steelhead trout distribution (and further from Chinook and coho salmon) and designated critical habitat.

Of all the proposed locations and associated roads/trails in Alternative 2 only one road crossing has a high likelihood of impacting ESA listed fish or habitat – the 1711630 Road crossing North Fork Mill Creek in Gibson Prairie. Mid-Columbia steelhead trout inhabit this stream and spawning has been documented upstream of this road crossing (Unpublished data, Mt. Hood National Forest, 2004). Other crossings in the Gibson location are either located over intermittent streams or are over 1.0 mile upstream of the upper limit of known steelhead distribution and designated critical habitat.

ESA listed fish bearing stream reaches are located downstream of roads/trails in the LaDee location (the closest road is about 1 mile upstream of the North Fork Clackamas River) and Bear Creek (closest trail over two miles above a known bull trout spawning and rearing area). New OHV trails in the Bear Creek location were designed to minimize encroachment into riparian reserves and avoid stream crossings except where necessary. All crossings are low to moderate risk of erosion and cross non-fish bearing streams. At least one Regional Forester's Special Status aquatic mollusk species and/or caddisfly are likely found in surface waters in all six proposed locations. Redband trout are only found near the McCubbins Gulch and Gibson Prairie locations. The rare and uncommon Basalt Juga snail may occur near roads/trails in the Gibson Prairie location.

Fine Sediment Summary

OHV use as proposed in Alternative 2 could increase erosion rates on proposed roads/trails and may exacerbate sedimentation into nearby streams. However, compared to Alternative 1 the overall impact across the Forest would be far less. Fewer roads/trails overall, fewer roads/trails close to streams, and far fewer crossings would significantly reduce the risk of erosion and sedimentation. Furthermore, erosion rates and stream sedimentation on any given road/trail, including at stream crossings, would be less than existing due to the implementation of PDC, particularly those that limit use in riparian areas and harden crossings to reduce erosion rates. There may be increased use in each of the proposed OHV locations since the majority of the Forest would be closed and use would thus be concentrated in the six locations. McCubbins Gulch and LaDee Flats already receive high levels of use and would likely experience similar use in the future. Therefore, erosion rates and sedimentation would be at similar levels (likely lower levels given PDC such as construction of a new OHV bridge at McCubbins Gulch) as the existing condition. There are also benefits expected from improved management of OHV use, such as staging areas that confine parking.

Impacts to aquatic fauna and habitat are difficult to quantitatively describe since use levels and potential sedimentation are unknown. However, any of the effects described in Alternative 1 are possible in this alternative as well, especially at high erosion risk perennial stream crossings. Since there are so few perennial stream crossings (26) compared to Alternative 1 (667) the risk of effects is far less. Sediment impacts would be localized near sources, particularly crossings, and because the sediment generated at each crossing is estimated to be minimal (even before PDC) the overall effects on aquatic life would also be small. Sedimentation would be exacerbated at one crossing near known distribution of ESA listed fish species (Mid-Columbia steelhead in NF Mill), but the amounts would be low with no chance of direct effects.

Alternative 2 would obliterate two shorts spurs, located near the Forest boundary, off the 4610 road, the 4610011 and 4610012 in the LaDee Flats OHV location. There would be localized disturbance of the old road bed as the road is decommissioned. Any disturbed soils are expected to have limited potential for transport if they enter the North Fork Clackamas due to instream habitat complexity. There is no predicted effect to ESA listed fish or critical habitat located over one mile downstream below a barrier falls. In the long term there would be a positive effect on the riparian area as riparian vegetation and riparian function is re-established. As described in PDC RD-9 the decommissioned roads will be left in a hydrologically stable condition.

One of the seven staging areas is located within a Riparian Reserve at McCubbins Gulch. Implementation of PDC S-3, WR-2, WR-1, WR-6 and WR-7 should reduce the likelihood of erosion and resulting sedimentation during staging area construction and use by requiring design and construction measures that "minimize erosion, sedimentation, and hazardous materials from leaching into surface waters." There is no hydrologic connection from any staging area to any stream. There would also be positive benefits to water quality from designating staging areas. As described in the soils report, containing OHV vehicles and parking in staging areas removes the effects of opportunistic parking along roads that contributes to sedimentation in ditchlines.

Alternative 2 would decommission numerous roads in the Peavine OHV location. All roads proposed for decommissioning are outside of riparian areas except two spurs off the 4200330 road. Decommissioning these roads may increase sedimentation to two small, unnamed tributaries in the short term, but the long term effect is beneficial. Because of stream size, instream channel complexity trapping sediment and distance from occupied fish habitat effects from decommissioning are predicted to be localized and not affect fish.

Pool Quality

There would be an improvement in pool quality across the Forest under Alternative 2 compared to the existing situation (Alternative 1). Concentrating use in six locations, as opposed to more widespread use across the Forest, would result is less sediment input in areas outside the locations and thus less potential filling of pools with fine sediment. It is assumed that overall OHV use would increase in the six locations given that other areas on the Forest would be closed and this in turn could increase the erosion potential in these locations. However, careful route planning, closure of some roads, installation of crossings over perennial streams and some intermittent streams, conversion of some roads to trail (which should reduce overall erosion on these trails), and hardening of crossing approaches where warranted would reduce, but not eliminate, OHV related erosion and subsequent sedimentation. Overall these measures are expected to lead to reduced levels of fine sediment in streams and thus improve pool quality over time compared to Alternative 1.

Water Chemistry

Adoption of the six OHV locations and seven associated staging areas proposed in Alternative 2 would result in a reduced risk of petrochemical spills and fecal coliform bacteria input to surface waters compared to Alternative 1. This reduced risk is due to several factors:

- Proposed staging areas would concentrate fueling and light maintenance use in small areas. Assessment of use and education of OHV users regarding the potential impacts of water contamination would be easier and corrective actions in the event of spills or other problems dealt with in a timely manner.
- Six of the seven proposed staging areas are located at least 100 feet from the closest waterway. The McCubbins Creek Campground staging area is within a Riparian Reserve. Despite their location pertinent PDCs (RM-7, EDU-3, EDU-4, WR-1) would improve site conditions and result in reduced risk of a spill and deleterious effects to water quality and aquatic fauna.
- During construction activities refueling would occur at least 150 feet away from surface water.
- Sanitary facilities would be present at each staging area.
- Proposed roads/trails and closed roads would significantly reduce the overall area accessible to OHV traffic, thus reducing the chance for water contamination Forest-wide.
- Newly constructed trails were designed to avoid riparian reserves where possible. Where unavoidable the vast majority of new trail within 100 feet of waterways are located near intermittent, non-fish bearing streams, greatly minimizing potential deleterious effects in the event of a spill away from staging areas (already a very low risk possibility).

The net result of the factors above is an extremely low risk (lower than Alternative 1) of a petroleum product spill that could affect surface water and thus fish and aquatic macroinvertebrates. Given the available research and presence of sanitation facilities risk of fecal coliform contamination is negligible.

Connectivity

Compared to Alternative 1 aquatic fauna connectivity would be slightly improved under this alternative due to the removal of one culvert in a fish-bearing (redband trout) stream within the McCubbins Gulch location on a road proposed for closure. In addition, as stipulated in PDC WR-4 all new trail stream crossings over fish bearing streams would incorporate stream simulation design. This would ensure fish and other aquatic fauna passage so there would be no net reduction in connectivity. On roads converted to trails, mixed-use roads, and existing trails aquatic connectivity would remain as is since no new crossings are proposed nor modifications proposed at existing crossings.

Disturbance

The potential for direct disturbance to aquatic organisms from OHV traffic is much less in this alternative compared to Alternative 1. The primary reason is the closure of many current roads/trails and off road use across the Forest. This would greatly reduce the use of existing fords believed to be scattered across the Forest. Concentration of OHV use in the six locations with proposed roads/trails that have few fords, coupled with bridge and culvert crossings over fish bearing streams associated with new construction and to bring any existing fords into compliance with PDC, would result in less disturbance (PDC WR-5 fords would not be permitted in fish bearing streams). Some fords may remain that are over small perennial streams and/or small wet areas that are not fish bearing, so the disturbance impact to aquatic macroinvertebrates is not eliminated altogether. Some of these areas may contain Regional Forester's Special Status aquatic macroinvertebrate species. Some existing and new road/trail crossings over intermittent streams, especially in the McCubbins Gulch location, would be fords. Impacts to channel conditions could be expected and there would be minimal disturbance to fish or Regional Forester's Special Status aquatic macroinvertebrates.

Summary of Direct and Indirect Effects for Alternative 2

Implementation of Alternative 2 would result in a large reduction in the amount of OHV travel ways compared to Alternative 1. OHV use would be limited to six proposed OHV locations, five of which currently have some level of OHV use (Bear Creek is the lone new location). The potential erosion and resulting sedimentation would increase in those six locations as OHV use increases. The above-mentioned design criteria for OHV locations are expected to substantially reduce the potential for erosion and sedimentation. Benefits to water quality would be realized by road decommissioning after some initial potential for short-term sedimentation. Generally, effects to fish and other aquatic species is expected to be insignificant and localized below stream crossings. Proposed OHV use may impact Special Status species in all six locations, especially snails, from small amounts of fine sediment entering at stream crossings.

Cumulative Effects for Alternative 2

A full description of cumulative effects for all alternatives is found in Table 3-79. Since the spatial area of OHV use is confined to six proposed locations in Alternative 2, the potential for cumulative effects is much lower than Alternative 1.

Findings relevant to aquatic fauna and habitat are summarized below.

Fine Sediment

There is a probability of cumulative effects to aquatic habitat from sediment associated with vegetation treatments, road and trail maintenance, invasive plant treatments and aquatic restoration overlapping with effects from OHV use allowed in Alternative 2. If these projects are spaced closely together in time (within three years of each other), there is a higher chance that there would be a measurable cumulative effect than if they are implemented over a longer period of time.

Disturbance

There is a low probability of disturbance related cumulative effects to aquatic fauna from invasive plants treatment, which may require wading or boating in waterways, resulting in overlap with OHV use.

Alternative 3

Alternative 3 increases (as compared to Alternative 2) the proposed OHV roads/trails on the Forest by adding additional motorized recreation opportunities within the McCubbins Gulch, Rock Creek, Bear Creek, and LaDee Flats proposed OHV locations. The proposed roads/trails within Gibson Prairie are changed to allow for access to the Hood River County motorized system on private and county lands. Proposed roads/trails within Peavine have been altered by dropping roads/trails to the south and adding roads/trails to the west to address concerns identified during tribal consultation. In addition, this alternative adds two new locations: Graham Pass and Mt. Defiance. The proposed roads/trails within the Mt. Defiance location allow access to the Hood River County motorized system.

Alternative 3 proposes to decommission 1.53 miles of road within 100 feet of streams (Table 3-80). This alternative would use or convert 13.84 miles of existing roads or trails and construct 1.11 miles of new trail within 100 feet of streams (Table 3-85). The majority of new trail construction within 100 feet of streams is proposed in the Bear Creek, Peavine and Rock Creek OHV locations. The Bear Creek trail segments are mostly over tributaries to Tony Creek while the Peavine roads/trails cross tributaries to the Oak Grove Fork Clackamas River. The Rock Creek roads/trails cross Souva Creek, Gate Creek and a number of other tributary streams.

Fine Sediment

Indirect and direct sediment effects are similar to those described for Alternative 2 but they differ in location and magnitude. Alternative 3 proposes more OHV roads/trails near surface water and in riparian areas than Alternatives 2 and 4, but the disturbance is still greatly reduced from Alternative 1 (Table 3-85). Most of the additional crossings are existing roads (which already experience both OHV and other vehicle traffic) whereas the total number of trail crossings actually is less than Alternative 2 (Tables 3-86 and 3-87). Important factors relating to erosion and sedimentation have already been discussed in the Soils and Water Quality Sections. The greatest difference is the addition of the proposed Graham Pass OHV location. Most of the additional stream crossings are associated with Graham Pass (most of which are existing mixed-use roads; relatively few trails), but there are increases in several other locations as well (Tables 3-86 and 3-87). The Soils Section describes the low erosion potential of existing roads in Graham Pass. There would be no new construction in the Graham Pass location.

Table 3-85. OHV road/trail lengths (in miles) within 100 feet of surface water for each of the proposed OHV locations in Alternative 3. For each location the information is grouped by fish bearing or non-fish bearing water body.

OHV Location	Fish Bearing	Roads	Trails - Existing	Trails - New	Grand Total
Bear Creek	Y	0.0			0.0
	N	0.3		0.2	0.5
Gibson Prairie	N	0.1			0.1
Graham Pass	Y	0.7			0.7
	N	4.1	0.3		4.4
LaDee Flats	Y	0.1			0.1
	N	1.1			1.1
McCubbins Gulch	Y	0.1	0.4	0.0	0.6
	N	0.9	1.5	0.1	2.6
Mt. Defiance	N	0.1			0.1
Peavine	Y	0.8			0.8
	N	1.6		0.5	2.2
Rock Creek	Y	0.2			0.2
	N	1.4		0.2	1.6
Total Fish Bearing		2.0	0.4	0.0	2.5
Total Non-fish		9.5	1.8	1.1	12.4
Grand Total		**11.6**	**2.3**	**1.1**	**15.0**

Table 3-86. Total number of intermittent stream crossings associated with roads/trails proposed in Alternative 3 for each OHV location. Non-native erosion risk refers to non-native surface roads which are less prone to erosion than native surface roads and trails.

OHV Location	Erosion Risk	Roads	Trails - Existing	Trails - New	Grand Total
Bear Creek	Moderate	1		1	2
Graham Pass	Moderate	2	4		6
	Non-native	70			70
LaDee Flats	Low	3			3
	Non-native	9			9
McCubbins Gulch	High		9	1	10
	Moderate	6	13	1	20
	Non-native	5		1	6
Peavine	Moderate	7		4	11
	Non-native	15		2	17
Rock Creek	High	1		1	2
	Moderate	2			2
	Non-native	14			14
Grand Total		**135**	**26**	**11**	**172**

Table 3-87. Total number of perennial stream crossings associated with roads/trails proposed in Alternative 3 for each OHV location. Non-native erosion risk refers to non-native surface roads which are less prone to erosion than native surface roads and trails. Numbers in parentheses are crossings over fish bearing streams. (Total fish bearing crossings = 35)

OHV Location	Erosion Risk	Roads	Trails - Existing	Trails - New	Grand Total
Bear Creek	Low			1	1
	Moderate			3	3
	Non-native	3(1)			3
Graham Pass	Non-native	20(15)			20
LaDee Flats	Low	2			2
	Non-native	4(2)			4
McCubbins Gulch	High		1(1)	1(1)	2
	Moderate	1	2(2)		3
	Non-native	1(1)	1(1)		2
Mt. Defiance	Moderate	2			2
Peavine	Moderate	3(3)			3
	Non-native	4(3)			4
Rock Creek	Low	1			1
	Moderate	1			1
	Non-native	9(5)			9
Grand Total		**51**	**4**	**5**	**60**

Fine sediment effects to fish would be localized at stream crossings. In Graham Pass the probability of fine sediment affecting fish would be extremely low due to the quality of the roads. One road segment of the 4672 road crosses Berry Creek approximately 0.5 miles upstream of its confluence with Cub Creek. ESA listed Lower Columbia River steelhead and Chinook salmon occupy both Berry and Cub Creeks and both are designated critical habitat. Steelhead ascend Berry Creek past the 4672 road, Chinook do not. Other segments of the 4672 road are located in headwaters immediately above (within 0.25 miles) the upper extent of fish presence and critical habitat for Lower Columbia River steelhead in Hunter, Fawn, and Lowe Creeks. Steelhead presence and designated critical habitat in Rhododendron Creek ends over 1.5 miles downstream of the 4672 road. There is a low probability fine sediments generated at the 4672 stream crossing would affect Lower Columbia River steelhead and Chinook salmon and their habitat, but the magnitude of the effect would be negligible, due to the low amount of fine sediment.

Alternative 3 proposes the greatest amount of road decommissioning: 1.5 miles within 100 feet of fish bearing streams (Table 3-80). As described in the Water Quality Section there would be short-term sedimentation (primarily in the Peavine location) with a long-term improvement in water quality associated with road decommissioning. As described in the Soils Section, the Peavine landform is gentle and rolling, and there is low risk of sediment transport from decommissioned roads to streams.

One of the 10 proposed staging areas is located within a riparian area at McCubbins Gulch. Implementation of PDC S-3, WR-2, WR-1, WR-6 and WR-7 should reduce the likelihood of erosion and resulting sedimentation during staging area construction and use by requiring design and construction measures that "minimize erosion, sedimentation, and hazardous materials from leaching into surface waters." There is no hydrologic connection from any staging area to any stream.

Pool Quality

There would be an improvement in pool quality across the Forest under Alternative 3 compared to Alternative 1, but not to the extent expected in Alternative 2. This is due to two additional locations in this alternative as well as more than twice the number of stream crossings. Many of the additional crossings are associated with roads which have established crossing structures (culverts or bridges) but some erosion could occur at these sites nonetheless. Most of the additional crossings are associated with the Graham Pass location (most of which are mixed-use roads) where there is low erosion potential.

Water Chemistry

There are 10 staging areas in eight proposed OHV locations proposed in Alternative 3. Despite the increase in roads/trails and staging areas compared to Alternative 2 there is still a very low risk of petrochemical and/or fecal coliform bacteria contamination to surface waters due to the same factors outlined above for Alternative 2. Comparatively, the risk of surface water contamination under Alternative 3 is extremely low, but slightly higher than Alternative 2 due to increased road/trail lengths within 100 feet of surface water, as well as more stream crossings. The addition of three more staging areas would have no effect on water quality, and thus aquatic fauna, as they are located outside riparian reserves.

Connectivity

There are three crossings proposed for removal in fish bearing streams on roads to be closed. Other roads/trails would be unchanged regarding connectivity. Therefore, this alternative improves connectivity slightly more than Alternative 2.

Direct Disturbance

Despite the overall increase in the number of stream crossings in this alternative the effects to aquatic fauna from a disturbance perspective are commensurate with those described for Alternative 2, perhaps slightly less. This is because most of the additional crossings are associated with roads and total trail crossings are actually less (39 vs. 42 in Alternative 2). There are five fish bearing trail stream crossing proposed in this alternative compared to six in Alternative 2. Since these would not be fords in both alternatives the impacts to fish would be the same. Potential impacts to aquatic macroinvertebrates could be slightly less because the number of perennial, non-fish bearing stream crossings that would be fords is slightly less than in Alternative 2 (9 vs. 12). There is one stream crossing in the Graham Pass location that bisects Cub Creek on the 4672 road. This road is currently open to vehicle traffic. Increases in OHV use in the Graham Pass location under this alternative are expected to be low (Malcolm Hamilton, personal communication), and there is no predicted increase in disturbance to fish.

Summary of Direct and Indirect Effects for Alternative 3

Implementation of Alternative 3 would result in a large reduction in the amount of OHV use compared to Alternative 1. OHV use would be confined to eight proposed OHV locations, seven of which currently contain some level of OHV use (Bear Creek is the exception). The amount of potential erosion and resulting sedimentation could increase in those eight locations if OHV use increases; however, the design criteria for OHV roads/trails and staging areas are expected to substantially reduce the potential for erosion and sedimentation. Benefits to water quality would be realized by road decommissioning, after some initial potential for short-term sedimentation. Effects to fish and other aquatic species are expected to be insignificant and would be localized below stream crossings. Overall pool quality may be slightly decreased.

The Forest received a comment letter from the USDI Fish and Wildlife Service on April 2, 2009 expressing concerns about the Graham Pass location and the potential impacts OHV use could cause on bull trout if they were reintroduced into nearby streams. Specifically, Cub Creek, Berry Creek, Hunter Creek, and Rhododendron Creek were all identified as high habitat quality streams that would be a high priority for bull trout reintroduction. All but Cub Creek are crossed by the 4672 road discussed above. Although small amounts of fine sediment could be introduced to these creeks via OHV use, the potential effects on bull trout would be the same as described above (and in Section 3.4.3) for other fish. Justification for this determination is as follows:

The 4672 road is a gravel surface road and thus the erosion potential is quite low.
The road is in good condition (Serena Helvey, Mt. Hood National Forest, Personal Communication).
Habitat conditions are of the highest quality in the afore mentioned streams (Shively et al. 2007) and given that this road has been open for years with mixed use it appears road related erosion has not been enough to greatly affect this habitat. There is little reason to assume keeping this road open to OHV and other traffic would greatly increase erosion.
Overall this alternative would decrease erosion potential and resultant sedimentation since no cross-country travel would be permitted and many spur roads in this location would be closed (there would be a large decrease in road/trail mileage).
The crossings over Hunter and Berry creeks are bridges that would result in even less potential erosion and sedimentation than culverts. No new crossings are proposed.

Cumulative Effects for Alternative 3

A full description of cumulative effects for all alternatives is found in Table 3-79. Since the spatial area of OHV use is confined to eight proposed locations in Alternative 3, the potential for cumulative effects is much lower compared to Alternative 1. If these projects are spaced closely together in time (within three years of each other), there is a higher chance that there would be a measurable cumulative effect than if they are implemented over a longer period of time.

Disturbance

There is a low probability of cumulative effects to aquatic fauna from treatment of invasive plants, which may require wading in waterways resulting in overlap with OHV use.

Alternative 4

Alternative 4 decreases proposed OHV roads/trails on the Forest by adjusting motorized recreation opportunities within McCubbins Gulch, Rock Creek, and LaDee Flats compared to Alternatives 2 and 3. The following proposed OHV locations are not included in this alternative: Bear Creek, LaDee Flats, Gibson Prairie, Graham Pass, Peavine, and Mt. Defiance.

Fine Sediment

Potential effects from fine sediment are similar to those described for Alternative 2 but less of an impact is expected due to fewer roads/trails and stream crossings. Fewer OHV roads/trails near surface water and in riparian areas are proposed compared to Alternatives 2 and 3 (Table 3-88), and the disturbance area is greatly reduced from Alternative 1. Important factors relating to potential erosion and sedimentation related to OHV use, and extensive discussions of probability of sediment production and transport have already been discussed above and in the Soils and Water Quality Sections.

Alternative 4 has the lowest number of native surface road/trail crossings compared to Alternatives 2 and 3 (Tables 3-89 and 3-90). Ten native surface stream crossings are located in high surface erosion potential soils, and 20 crossings on moderate surface erosion potential soils. The majority of the erosive crossings are in the McCubbins Gulch location. Five staging areas are proposed in Alternative 4.

There are no road/trail crossings proposed over streams with ESA fish or designated critical habitat present. The closest ESA listed fish bearing streams to any roads/trails in this alternative are located over one mile downstream of proposed roads/trails in the LaDee location. There is no effect from fine sediment input to ESA listed fish and critical habitat due to the distance from proposed OHV locations.

Almost 0.7 miles of road within 100 feet of streams and seven stream crossings are proposed to be decommissioned in Alternative 4. Decommissioning could cause short-term sedimentation to adjacent streams, but would provide a long-term reduction in erosion and sedimentation once these crossings revegetate and stabilize. This alternative would use or convert 3.74 miles of existing roads or trails and construct 0.08 miles of new trail within 100 feet of streams. The majority of new trail construction within 100 feet of streams is proposed in the Rock Creek OHV location and includes one trail segment that is within 100 feet of an intermittent tributary to Gate Creek.

Table 3-88. Road/trail lengths (in miles) within 100 feet of surface water for proposed OHV locations in Alternative 4. For each location the information is grouped by fish bearing or non-fish bearing water body.

OHV Location	Fish Bearing	Roads	Trails - Existing	Trails - New	Grand Total
LaDee Flats	Y	0.1			0.1
	N	0.2			0.2
McCubbins Gulch	Y	0.1	0.4		0.6
	N	0.4	1.5	0.0	1.9
Rock Creek	Y	0.1			0.1
	N	0.9		0.1	0.9
Total Fish Bearing		0.3	0.4		0.7
Total Non-fish		1.5	1.5	0.1	3.1
Grand Total		**1.8**	**2.0**	**0.1**	**3.8**

Table 3-89. Total number of intermittent stream crossings associated with roads/trails proposed in Alternative 4 for each OHV location. Non-native erosion risk refers to non-native surface roads which are less prone to erosion than native surface roads and trails.

OHV Location	Erosion Risk	Roads	Trails - Existing	Trails - New	Grand Total
LaDee Flats	Non-native	2			2
McCubbins Gulch	High		9		9
	Moderate	3	13		16
	Non-native	1			1
Rock Creek	Moderate	1			1
	Non-native	10			10
Grand Total		**17**	**22**		**39**

Table 3-90. Total number of perennial stream crossings associated with roads/trails proposed in Alternative 4 for each OHV location. Non-native erosion risk refers to non-native surface roads which are less prone to erosion than native surface roads and trails. Numbers in parentheses are crossings over fish bearing streams.

OHV Location	Erosion Risk	Roads	Trails - Existing	Trails - New	Grand Total
LaDee Flats	Non-native	2			2
McCubbins Gulch	High		1		1
	Moderate		2		2
	Non-native	1	1		2
Rock Creek	Moderate	1			1
	Non-native	6			6
Grand Total		**10**	**4**	**0**	**14**

Pool Quality

This alternative would result in the least impact in pool quality compared to all other alternatives. There are far fewer miles of existing and proposed new roads/trails in this alternative, as well as fewer streams crossings. As such, the potential for increased sedimentation resulting in pool quality degradation is negligible.

Water Chemistry

The risk of surface water contamination under Alternative 4 is the lowest for all alternatives. This alternative has the fewest OHV locations (3), fewest staging areas (5), and fewest road/trail miles. The factors minimizing risks from pollutants described for Alternative 2 above apply to this alternative as well.

Connectivity

Alternative 4 is the same as Alternative 2: one fish bearing crossing removed in the McCubbins location.

Direct Disturbance

The potential for direct disturbance to aquatic organisms from OHV traffic is much less in this alternative compared to other alternatives. The primary reason is the closure of many current roads/trails and off road use across the Forest. This would greatly reduce the use of existing fords scattered across the Forest. Concentration of OHV use in the three locations, few fords, and new crossings over fish bearing streams associated with new construction would result in few locations where disturbance could occur. There are no crossings proposed over streams with ESA fish or designated critical habitat present.

Summary of Direct and Indirect Effects for Alternative 4

Implementation of Alternative 4 would result in the largest reduction in OHV use of all action alternatives compared to Alternative 1. OHV use would be confined to three proposed OHV locations, all of which currently contain some level of OHV use. The amount of potential erosion and resulting sedimentation could increase in those three locations if OHV use increases; however, the design criteria for OHV roads/trails and staging areas would substantially reduce the potential for erosion and sedimentation. Benefits to water quality would be realized by road decommissioning, after some initial potential for short-term sedimentation. Overall pool quality may be slightly decreased below crossings. Effects to fish and other aquatic species are expected to be insignificant and would be localized below stream crossings. No ESA listed fish or designated critical habitat is located within the three proposed OHV locations.

Cumulative Effects for Alternative 4

A full description of cumulative effects for all alternatives is summarized in Table 3-79. Since the spatial area of OHV use is confined to three proposed locations in Alternative 4, the potential for cumulative effects is much lower compared to Alternative 1 and the other action alternatives. If projects are spaced closely together in time (within three years of each other), there is a higher chance that there would be a measurable cumulative effect than if they are implemented over a longer period of time.

Disturbance

There is a low probability of cumulative effects to aquatic fauna from treatment of invasive plants, which may require wading in waterways resulting in overlap with OHV use.

3.4.3. Comparison of Effects and Aquatic Fauna Effects Determinations

Comparison of Direct and Indirect Effects for All Alternatives

Fine Sediment

Erosion potential and subsequent sedimentation into streams would improve in all action alternatives compared to Alternative 1. Confining OHV use to between three to eight proposed locations with staging areas would reduce OHV use within riparian reserves and the number of stream crossings. Project design criteria would further minimize erosion at stream crossings in OHV locations compared to existing conditions. There could be short term localized increases in fine sediment in a small number of streams from road decommissioning. Overall, Alternative 4 has the least risk of fine sediment input to streams, followed by Alternatives 2, 3, and 1.

Pool Quality

Pool quality, in terms of fine sediment reducing pool volume, could be slightly degraded below stream crossings in all action alternatives; however, conditions would be an improvement compared to Alternative 1. Confining OHV use to between three to eight proposed locations would reduce the number of stream crossings and project design criteria would minimize erosion risk at all crossings. There could be localized increases in fine sediment in some streams below stream crossings or decommissioned road segments that may slightly increase the amount of fine sediment deposited in pools. Overall, alternative 4 has the least risk of reducing pool quality, followed by Alternatives 2, 3, and 1.

Water Chemistry

There is a low risk of chemical or bacteriological contamination of surface waters in each alternative, including Alternative 1. The low risk is due to a variety of factors including proximity of OHV use near water, relatively few areas of concentrated use (i.e., staging areas), very low risk of spills away from staging areas, presence of sanitary facilities, and fate of spilled material on the ground. Alternative 4 has the least risk of surface water contamination, followed by Alternatives 2, 3, and 1.

Connectivity

Connectivity would be slightly improved in all action alternatives compared to Alternative 1 due to the proposed removal of culverts on fish bearing streams. However, the improvement is slight as only three culverts would be removed from fish bearing streams in Alternative 3, and one culvert removed in both Alternatives 2 and 4. Aquatic fauna connectivity in streams at other crossings would remain the same as in Alternative 1.

Direct Disturbance

Direct disturbance to aquatic fauna would be reduced in all action alternatives compared to Alternative 1. Confining OHV use to between three and eight proposed locations would reduce the number of stream crossings including known and suspected fords, resulting in reduced risk of direct disturbance to aquatic fauna. Although use would increase in the proposed OHV locations, overall impacts are reduced with no cross-country travel and unregulated stream crossings. Alternative 4 has the least risk of direct disturbance, followed by Alternatives 2, 3, and 1.

Summary of Cumulative Effects for All Alternatives

Fine Sediment

Measurable cumulative effects are possible as a result of sediment introduction from this project. The risk depends on the timing of this project and other projects listed. If projects are spaced closely together in time (within three years of each other), there is a higher chance that there would be a measurable cumulative effect than if they are implemented over a longer period of time. This is due to the dispersal of sediment throughout the stream system as time goes on. The highest risk is associated with Alternative 2, a low risk in Alternative 3 and no risk in Alternative 4.

Pool Quality

Measurable cumulative effects are possible as a result of sediment introduction from this project. This could result in localized reduction of pool quality, although this is expected to be very minor. The highest risk is associated with Alternative 3, a lower risk in Alternative 2 and lowest risk in Alternative 4.

Water Chemistry

There would be little to no chance for cumulative effects related to OHV derived chemicals due to the implementation of PDC that minimize the chance of introducing these chemicals to surface water.

Connectivity

There would be no predicted overlap in time and space related to connectivity and designating OHV locations.

Disturbance

Cumulative effects from disturbance would be limited to invasive plant treatments and overlap with OHV use at stream crossings. It is expected to be rare.

ESA Listed Fish and Regional Forester's Special Status Species Effects/Impacts Determinations

The following discussion summarizes effects to ESA listed fish, their critical habitat, Regional Forester's Species Status aquatic species, and Essential Fish Habitat for all alternatives (Table 3-91). A brief rationale is given for each alternative.

Table 3-91. Effects determination summary for all alternatives for ESA listed fish and designated critical habitat, Regional Forester's Special Status Species, and Essential Fish Habitat.

	Date of Listing & Critical Habitat	Suitable Habitat Present	Species Present	Effects of Actions Alternatives			
Endangered Species Act Listing by ESU/DPS *Threatened*				***1***	***2***	***3***	***4***
Lower Columbia River steelhead & CH (*Oncorhynchus mykiss*)	1/06 9/05	Y	Y	LAA	NE	NLAA	NE
Lower Columbia River chinook & CH (*Oncorhynchus tshawytscha)*	6/05 9/05	Y	Y	LAA	NE	NE	NE
Columbia River Bull Trout* (*Salvelinus confluentus*)	6/98	Y	Y	LAA	NE	NE	NE
Middle Columbia River steelhead & CH (*Oncorhynchus mykiss*)	1/06 9/05	Y	Y	LAA	NLAA	NE	NE
Upper Willamette River chinook & CH (*Oncorhynchus tshawytscha)*	6/05 9/05	Y	Y	LAA	NE	NE	NE
Lower Columbia River coho* *(Oncorhynchus kisutch)*	6/05	Y	Y	LAA	NE	NE	NE
Regional Forester's Special Status Species List							
Interior Redband Trout (Oncorhynchus mykiss spp.)	7/04	Y	Y	MIIH	MIIH	MIIH	MIIH
Columbia duskysnail *(Colligyrus sp. nov. 1)*	1/08	Y	Y	MIIH	MIIH	MIIH	MIIH
Barren Juga *(Juga hemphilli hemphilli)*	1/08	Y	Unk	MIIH	MIIH	MIIH	MIIH
Purple-lipped Juga *(Juga hemphilli maupinensis)***	1/08	Y		MIIH	NI	NI	NI
Scott's Apatanian Caddisfly *(Allomyia scotti)*	1/08	Y	Unk	MIIH	MIIH	MIIH	MIIH
Essential Fish Habitat							
		Y	N/A	AE	NAA	NAA	NAA

*Critical habitat is not designated for these species on Federal lands
**This species is not believed to inhabit streams near proposed OHV locations but may be present in larger streams near the Forest boundary.

Endangered Species Act Abbreviations/ Acronyms:		**Essential Fish Habitat Abbreviations/ Acronyms:**	
NE	No Effect	NAA	Not Adversely Affected
NLAA	May Affect, Not Likely to Adversely Affect	AE	Adverse Effects
LAA	May Affect, Likely to Adversely Affect		
Regional Forester's Sensitive Species List Abbreviations/ Acronyms:			
Unk	Species presence unknown but suspected		
NI	No Impact		
MIIH	May impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species		

Alternative 1

The adoption of the No Action Alternative would have the greatest impact on ESA listed and Regional Forester's Special Status fish and other aquatic species. This is due to continued OHV use across most of the Forest, including overland travel on over 350,000 acres. This widespread use, including well over 2,500 stream crossings (some of which are known and suspected fords), and no adoption of PDC would result in more erosion and subsequent sedimentation into surface waters compared to other alternatives. Although the amount of erosion at any given location may be relatively small the combined effect of use across the forest would result in the introduction of enough fine sediment to adversely effect aquatic fauna and habitat at least in heavily used areas. The chance for direct disturbance is also highest in this alternative given the presence of known and suspected fords across the Forest.

Alternative 2

The six proposed OHV locations in Alternative 2 would greatly reduce OHV use across the Forest with potential effects confined to those locations and up to one half mile downstream of stream crossings. The chance for direct disturbance to aquatic fauna and habitat would be negligible because all but one known ford (an intermittent, non-fish bearing stream in the McCubbins Gulch location) would be eliminated. The potential for erosion and subsequent sedimentation would be less compared to Alternative 1 but not eliminated entirely. There is only one proposed stream crossing in all six proposed locations located within one half mile of ESA listed fish species and designated critical habitat: the 1711630 road that crosses North Fork Mill Creek in the Gibson Prairie location. Middle Columbia steelhead trout are known to reside in this stream up to and above this crossing. None of the locations are within one half mile of essential fish habitat.

Although erosion from this road at the crossing is expected the amount of fine sediment generated would be small and would not result in biologically relevant (i.e. deter spawning success or survival) effects to steelhead individuals. Some slight filling of pools immediately below the crossing is possible thus there could be minor effects to critical habitat. As such the effects determination is a may affect, not likely to adversely affect for Middle Columbia River steelhead trout and critical habitat. There could be impacts to Regional Forester's Special Status aquatic species and habitat for reasons outlined above and in Section 3.4.2.

Alternative 3

The eight proposed OHV locations in Alternative 3 reduce OHV use across the Forest (but not to the extent that Alternatives 2 and 4 would) with potential effects limited to one half mile below road/trail crossings. Potential direct effects (disturbance) are the same as described for Alternative 2. There is only one OHV location where potential effects to ESA listed fish and critical habitat could occur: Graham Pass. Note that the one crossing in the Gibson Prairie OHV location discussed in Alternative 2 is not included in this alternative.

The 4672 road is a proposed OHV route within the Graham Pass OHV location that crosses four streams within one half mile of known Lower Columbia River steelhead distribution and designated critical habitat. These streams are Lowe Creek, Fawn Creek, Hunter Creek, and Berry Creek. Steelhead also reside in Cub Creek within one half mile below the 4672 road. This road is a gravel road already open to OHV and licensed vehicle traffic. The proposed designation of this location and road could increase overall OHV traffic but the resultant erosion should not significantly increase. Although erosion from this road at the four crossings is expected the amount of fine sediment generated would be small and would not result in biologically relevant (i.e. deter spawning success or survival) effects to steelhead individuals. Some slight filling of pools immediately below the crossings is possible thus there could be negligible effects to critical habitat. As such the effects determination is a may affect, not likely to adversely affect for Lower Columbia River steelhead trout and critical habitat. There could be impacts to Regional Forester's Special Status aquatic species and habitat for reasons outlined above and in Section 3.4.2. Essential fish habitat is not located within one half mile of any road/trail crossing thus there would be no adverse affects to essential fish habitat.

Alternative 4

This alternative would result in the least impact to aquatic fauna and habitat compared to other alternatives. Two of the three proposed OHV locations are within watersheds that do not harbor ESA listed fish, designated critical habitat, or essential fish habitat. The other proposed OHV location (LaDee Flats) is located over one mile upstream of ESA listed fish distribution and habitat. There would be no effect from direct disturbance to ESA fish and critical habitat due to the distance from the proposed LaDee OHV location. Only one ford may remain in McCubbins Gulch and this is located across an intermittent stream that is not believed to harbor any Special Status aquatic species. Any sediment introduced from OHV use at LaDee would not extend far enough downstream to affect ESA listed fish or habitat, as well as essential fish habitat. Special Status aquatic species may be present within a half mile of road/trail crossings in all three proposed OHV locations thus fine sediment impacts to these species or habitat are possible.

Effects to Lamprey, Cutthroat Trout, and the Basalt Juga

Potential impacts to Pacific lamprey and cutthroat trout individuals and habitat could occur in any alternative. As described above for other aquatic species the potential impacts would primarily be related to fine sediment and for cutthroat at least are similar to effects described above and in Section 3.4.2. Cutthroat are widespread throughout the

Forest (exceptions are the Rock Creek, McCubbins Gulch, and Mt. Defiance OHV locations) and could be impacted by all alternatives. Lamprey are more tolerant of fine sediment (the young live in sand beds) thus impacts would likely be negligible.

The Basalt Juga has been found near the Forest boundary in North Fork Mill Creek and may be present within one half mile of the Gibson Prairie OHV location. As such eroded fine sediment from this location could impact Basalt Juga individuals or habitat; however, the overall survival and distribution of this rare and uncommon species would not be at risk given the localized nature of potential effects.

3.4.4. Incomplete and Unavailable Information

Total current OHV use is not well documented. It is suspected that many user created trails have not been inventoried. Impacts from unregulated stream crossings are not well documented.

3.5. Wildlife

This analysis is based on the information found in the Wildlife Specialist Report for this project, which is in the project record located at the Forest Headquarters Office in Sandy, Oregon.

3.5.1. Affected Environment

The action area for this project is spaced across the Forest and encompasses westside lowland conifer-hardwood forest, eastside mixed conifer forest, montane mixed conifer forest, ponderosa pine/Douglas fir conifer forest, and lodgepole pine forest and woodland habitat types. The proposed project is located in both deer and elk winter range and calving areas. Most areas are in dispersal spotted owl habitat, but there are pockets of suitable habitat scattered in proposed locations on the eastside of the Forest. A couple of the proposed locations have nesting spotted owls. There are no bald eagles or peregrine falcon nest sites near the proposed OHV systems.

Currently, OHVs are not prohibited on 2,463 miles of roads, 49 miles of trails, and 394,000 acres. The action alternatives analyzed would restrict any cross-country travel, restrict the roads and trails to at maximum of 326 miles, and place seasonal restrictions on when OHVs can operate. The proposed alternatives all have major benefits to wildlife, when compared to the No Action Alternative, by reducing both habitat impacts and disturbance related impacts by focusing OHVs to specific times and places as well as requiring OHVs to use designated roads, trails, and one small area. At the same time, these alternatives could have major impacts to hunting opportunities for those who have enjoyed using ATVs for both hunting and game retrieval. There would be a substantial reduction in hunting opportunities for this those individuals who prefer to hunt from ATVs. This fact is somewhat of a contradiction to the Executive Order 13443 of August 16, 2007, *Facilitation of Hunting Heritage and Wildlife Conservation*. The purpose of the executive order is to direct Federal agencies that have programs and activities that have a measurable 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 habitat. The action alternatives would reduce hunting opportunity, but would also improve the management of game species and their habitat.

Based on field observations, the some of the proposed new route construction sites have existing user created OHV trail use, although they are not part of the current trail system (see Table 3-92). Alternative 3 has the highest amount of non-user created new construction. The impacts of accepting and utilizing these existing sites has the affect of reducing any future potential impacts to small and less mobile species, such as salamanders and mollusk because their habitat has already been altered. Most of the trails proposed for new construction for Alternative 2 were surveyed for sensitive species. No target species were found. Presence was assumed for the additional trails proposed for new construction for Alternative 3 that were not surveyed.

Table 3-92. Comparison of user created trails vs. new trail construction (i.e., constructing trails where there has been no previous ground disturbance).

Proposed System	Alternative 2		Alternative 3		Alternative 4	
	User Created Trails	New Trails	User Created Trails	New Trails	User Created Trails	New Trails
Bear Creek	0.0	39.1	0.6	28.2	0.0	0.0
Gibson Prairie	0.0	4.3	0.0	0.3	0.0	0.0
Graham Pass	0.0	0.0	0.0	0.0	0.0	0.0
La Dee Flats	0.2	1.4	0.2	5.1	0.2	4.9
McCubbins Gulch	2.7	2.4	3.1	11.0	0.0	0.7
Mt. Defiance	0.0	0.0	0.0	0.0	0.0	0.0
Peavine	1.1	1.9	0.1	8.8	0.0	0.0
Rock Creek	3.3	2.9	0.8	5.8	0.2	3.0
Totals	7.3	52.0	4.8	59.2	0.4	8.6
Alternative Totals	**59.3**		**64.0**		**9.0**	

Many of the sites have a good amount of snags in the area. For safety reasons, there may be some reduction of danger trees along the trails. This may reduce the snags adjacent to the trail, but would also function to increasing down wood that serves as habitat for the small, low mobility species such as salamanders and mollusk.

The following is a brief description of the vegetation type at each of the proposed OHV systems:

- McCubbins Gulch: Ponderosa pine/Douglas fir and Eastside mixed conifer forest types are found in this proposed OHV system. Deer and elk summer range are located in the analysis area.

- Rock Creek: Ponderosa pine/Douglas fir and Eastside mixed conifer forest types are found in this proposed OHV system. Elk and deer winter range are located in the analysis area.

- Gibson Prairie: This proposed OHV system contains eastside mixed conifer habitat type. There is also suitable spotted owl habitat. Deer and elk summer range and calving and fawning area (as documented by Oregon Department of Fish and Wildlife telemetry studies over multiple years) is located in this analysis area.

- Bear Creek: This proposed OHV system contains montane mixed conifer habitat type. There is no spotted owl habitat, but there is deer and elk summer range.

- Peavine: Westside lowland conifer and montane mixed conifer habitat types are found in this proposed OHV system. There is marginal spotted owl habitat type. There are deer and elk calving areas.

- LaDee Flats: This proposed OHV systems contains westside lowland conifer mostly plantation and commercially thinned. This analysis area has had extensive OHV use in the past that has left large ponded areas. There is dispersal habitat extensively throughout the analysis area. There is deer and elk summer and winter range, but the use is marginal here.

- Mt. Defiance: Montane mixed conifer can be found in this proposed OHV system. There is mostly summer range and no winter range.

- Graham Pass: Westside lowland conifer and montane mixed confier habitat types are found in this proposed OHV system. The analysis area historically had a fair amount of big game utilization, but has lost its capacity to provide a lot of forage for large ungulates.

3.5.2. Effects Analysis

Northern Spotted Owl (Threatened)

Habitat Characteristics

Habitat for the owl is defined as either suitable or dispersal habitat. Suitable habitat for the northern spotted owl consists of habitat used by owls for nesting, roosting and foraging (NRF). Generally suitable habitat is 80 years of age or older, canopy cover exceeds 60 percent, is multi-storied and has sufficient snags and down wood to provide opportunities for nesting, roosting and foraging. Dispersal habitat for the owl usually consists of mid-seral stage stands between 40 and 80 years of age of age with a canopy closure of 40 percent or greater and an average diameter of 11". Spotted owls use dispersal habitat to move between blocks of suitable habitat; juveniles use it to disperse from natal territories. Dispersal habitat may have roosting and foraging components, enabling spotted owls to survive, but lack structure suitable for nesting. Owls can also disperse through suitable (NRF) habitat.

Analysis Areas

The project proposal involves no removal of suitable habitat for spotted owls. The removal of individual trees within suitable habitat would occur. Individual trees may need to be removed during new construction of trails or for hazard tree removal. The loss of individual trees would not affect spotted owls by either causing them to abandon their current site due to loss of habitat or causing them to have less foraging opportunities thereby reducing their ability to reproduce. There would not be any effects to spotted owl habitat by any of the proposed proposed OHV routes that would change the use or function of the habitat. The effects are not important to spotted owls since there is no change in the function of the habitat from any new construction or hazard tree removal. The loss of trees as hazard trees or for new construction would mimic natural situations where trees fall on the ground and become down wood.

Late-Successional Reserve (LSR)

There are five proposed OHV route systems where an OHV route may travel through or on the boundary of an LSR or LSR-100. LSRs are contiguous stands of forest that have been allocated to grow mature and old growth habitat for late successional obligate species. LSRs may still be young stands but the goal is to provide older habitat in the future. LSR-100s are mostly mature habitat in the proximity of known spotted owl activity centers. LSR-100s were allocated to provide habitat for owl pairs until LSRs had matured to the extent that they would provide spotted owls with suitable habitat for nesting. Table 3-95 shows the extent of the trails and routes that may impact LSR. There are a couple trails in the Peavine OHV system that are located in and adjacent to LSR. The majority of roads in this location are being decommissioned. One mixed-use route goes through approximately 14 miles of LSR in the LaDee Flats proposed OHV system. There is approximately 7-8 miles of route in the McCubbins Gulch proposed OHV system. In Alternative 3, there is a small amount of road going into Badger Lake that is on the boundary of LSR in the Rock Creek OHV system. Also, less than a quarter mile of road in the Mt Defiance OHV system is in LSR. All of these routes are existing routes and no changes from the current situation are expected.

Critical Habitat Units (CHU)

There is only one OHV route proposed that travels through approximately 14 miles of a Critical Habitat Unit. The 4610 road goes through LSR and CHU. It is an existing road now and no change in status is expected to affect spotted owls. This road is only considered part of the mixed-use road system in Alternatives 2 and 3. No effects to Critical Habitat or the spotted owl are anticipated from converting this to a mixed-use route. The effects determination for the effects of habitat modification of Critical Habitat is **May Affect, Not Likely to Adversely Affect** due to some need to fell hazard trees or trees removed for new construction of trails.

Direct and Indirect Effects to the Northern Spotted Owl due to Habitat Modification

Alternative 1 – No Action

Currently, there are about 2,463 miles of road that can be used by OHVs. There are no direct habitat affects to spotted owls from this alternative since there is no habitat removal. There could be trees felled as hazards, however this would not modify the function of the habitat. Therefore, there are no effects to spotted owls or their habitat from this alternative.

Alternatives 2, 3 and 4

Table 3-95 displays the analysis for spotted owls and their habitat. The assumption of this analysis is that very little habitat (vegetation) manipulation would occur. The forest opening for routes is narrow enough that there is no loss of habitat function. There are natural gaps in the forest that owls have always been able to cope with. Alternative 3 has the most new trail construction (Table 3-92). Any tree that needs to be removed for new construction would be left on site and provide down wood habitat for small mammals, which could improve spotted owl prey populations. There would be times that hazard trees would need to be removed but they would be left on site. Thus, there would be no change in the function of habitat from any of these alternatives.

Table 3-95 shows the potential for effects based on the amount of routes and trails in each proposed OHV location by alternative. The amount of habitat modification is below the level that effect any change in habitat function. The changes that result from OHV trail construction would not influence spotted owl habitat utilization. The effects determination for the effects of habitat modification is **May Affect, Not Likely to Adversely Effect** due to no changes in habitat function.

The action alternatives include decommissioning 13, 35, or 12 miles of roads (Alternatives 2, 3 and 4, respectively). This action has both positive and negative effects on the spotted owl and its habitat. The positive effect is that in the long term the road would once again become a part of the forest habitat and provide more forested land and could potentially produce more prey than the roaded habitat. On the negative side, decommissioning roads may reduce the ability to stop or slow down large catastrophic fires.

There would be no decline of the spotted owl that has been linked to the removal and degradation of available suitable habitat. Because the loss of habitat from a large fire is only hypothetical there is no adverse affects to the spotted owl or its habitat from habitat alteration or removal. Therefore, the effects determination for this project is **May Affect, Not Likely to Adversely Effect**.

Direct and Indirect Effects to the Northern Spotted Owl due to Noise Disturbance

Disturbance to owls appears to be negatively related to stimulus distance and positively related to noise level. Substantial noise, smoke and human presence can result in disruption of breeding, feeding, or sheltering behavior of the spotted owl such that it creates the potential for injury to the individuals (i.e., incidental take in the form of harassment). For a significant disruption of spotted owl behavior to occur as a result of disturbance caused by the proposed actions, the disturbance and owl(s) must be in close proximity to one another. A spotted owl that may be disturbed at a roost site is presumably capable of moving away from a disturbance without a substantial disruption of its behavior. The potential for affects is mainly associated with breeding behavior at active nest sites. There are no studies of disturbance to spotted owls that have demonstrated any loss of reproduction, death, or harm. Anecdotal evidence from working with spotted owls to locate nest and determine owl presence would indicate that spotted owls are very tolerant of noise and human presence, unlike other raptors such as bald eagles or peregrine falcons. Effects determinations for disruption are conservative and probably overstate the effect.

Table 3-93 shows the number of known sites within the disturbance and disruption distances of the routes for each alternative. Research has shown that activity centers that have been utilized in the past are likely to continue to be utilized in the future. This is less accurate on the eastside of the Cascades where spotted owls often nest in platform nests often created by tree deformities caused by disease and parasite, such as dwarf mistletoe. Owls on the eastside of the Cascades have a tendency to move their nest more frequently since they are not tied to cavities and have more abundant nest possibilities.

Effects to spotted owls from noise and human presence are based on the distances that the Willamette Province Level One Team has determined are important from an effects determination standpoint. *Disturbance* is the distance where an owl may detect a noise and may choose to react to that noise but would not be adversely affected. The *disruption* distance is the distance where noise levels could disrupt an owl's breeding and feeding habits, as well as reduce its reproductive potential. This noise threshold has been determined by the Level One Team (USFWS 2006) to be greater than 92 decibels. The reduction would meet the Endangered Species Act definition of harm or harassment and could lead to *incidental take*. The disruption distance for chainsaws or OHVs is 65 yards.

The following table displays the number of historic nest sites that are within the disturbance distance (0.25 miles) and the disruption distance (65 yards) of a potential OHV route or trail.

3-93. Number of known owls sites within the disturbance and disruption distances for each action alternative.

OHV System	Disturbance < 0.25 miles Disruption < 65 yards	Spotted Owl Sites Alternative 2	Spotted Owl Sites Alternative 3	Spotted Owl Sites Alternative 4
Rock Creek	Disturbance	2	2	2
	Disruption	2	1	1
Peavine	Disturbance	4	5	0
	Disruption	0	0	0
Mt. Defiance	Disturbance	0	0	0
	Disruption		0	
McCubbins Gulch	Disturbance	1	3	1
	Disruption	1	1	1
LaDee Flats	Disturbance	4	4	2
	Disruption	0	0	0
Graham Pass	Disturbance		6	
	Disruption		0	
Gibson Prairie	Disturbance	1	0	
	Disruption	0	0	
Bear Creek	Disturbance	0	0	0
	Disruption	0	0	0
Totals	**Disturbance**	**10**	**20**	**5**
	Disruption	**3**	**2**	**2**

Alternative 2 has two routes where there is a potential for disruption of three nest sites due to the proximity of the known spotted owl sites to the OHV routes. Alternatives 3 and 4 have two known sites within the disruption distance of the routes. There are several seasonal restrictions proposed that would reduce the potential for spotted owl disturbance and disruption, but these restrictions do not cover the entire critical breeding period. The critical breeding season for spotted owls in the northern Cascades of Oregon is March 1 to July 15. Our seasonal restrictions do not extend beyond June 15. Nest abandonment is reduced exponentially as the parents invest time into the young and their fidelity increases.

Road decommissioning activities included in the alternatives that generate noise above the local ambient levels are heavy equipment and chainsaw use. Disruption distances of 35 yards for heavy equipment use and 65 yards for chainsaw use have had concurrence by the Willamette Province Level One Team and the US Fish and Wildlife Service. If project implementation occurred during the critical breeding period for the spotted owl (March 1 – July 15th) within this distance of one of the historic owl nest sites near the project site, disturbances would be generated that may adversely affect the breeding of the spotted owl.

Alternative 1

There is potential for spotted owl disruption from OHV use throughout the areas where OHV use is unrestricted. The effects determination from disturbance for this alternative is **May Affect, Likely to Adversely Effect**. This means that at any time there is the potential for a spotted owl to experience nest disruption.

Alternative 2

There are three known spotted owl nest sites in this alternative, two at the Rock Creek OHV system and one at the McCubbins Gulch OHV system that could experience disruption. The effects determination from disturbance for OHV use and road decommissioning for this alternative is **May Affect, Likely to Adversely Effect.**

Alternative 3

There are two known spotted owl nest sites in this alternative, one at the Rock Creek OHV system and one at the McCubbins Gulch OHV system that could experience disruption. The effects determination from disturbance for OHV use and road decommissioning for this alternative is **May Affect, Likely to Adversely Effect.**

Alternative 4

There are two known spotted owl nest sites in this alternative, one at the Rock Creek OHV system and one at the McCubbins Gulch OHV system that could experience disruption. The effects determination from disturbance for OHV use and road decommissioning for this alternative is **May Affect, Likely to Adversely Effect.**

Cumulative Effects for the Northern Spotted Owl due to Habitat and Noise Disturbance

No cumulative effects are anticipated for spotted owls from OHVs. The nature of the habitat modification is too minor to be a factor even in an additive context. Disturbance to spotted owls is not a cumulative issue because unlike some other birds or mammals they are not easily disturbed and tend to tolerate people and noise. There are not other projects or activities that would be additive for disturbance for the owls.

Endangered Species Act Compliance

Formal consultation is required for disturbance for this decision. Consultation with the USFWS for disturbance will be completed prior to this decision. The effects determination from *disturbance* for several of the known sites is **May Affect and are Likely to Adversely Affect** northern spotted owls due to the proximity of the roads and trails to the known spotted owl nest sites. Effects to *Critical Habitat* are **May Affect, Not Likely to Adversely Affect** due to the potential loss of snags from danger tree removal. Snags are a primary constituent element but the amount of loss would be extremely low from a habitat standpoint. The effects call for *habitat modification* for this project is **May Affect, Not Likely to Adversely Affect** the northern spotted owl or its habitat.

Spotted Owl Recovery Plan

The USDI Fish and Wildlife Service signed the "Recovery Plan for the Northern Spotted Owl" *(Strix occidentalis caurina)* on May 13, 2008. The Plan outlined goals, objectives, recovery actions, and criteria for delisting the northern spotted owl. Emphasis for the recovery is protection and maintenance of suitable spotted owl habitat and older high quality habitat. The Recovery Plan also indicates possible threats from other natural or manmade factors affecting its continued existence. The only factors that were indicated were barred owls and climate change. Disturbance and use of OHVs was not considered a significant threat.

The Recovery Plan was reviewed prior to the analysis of spotted owls for this document. There were no factors that would alter any effects determination made during this analysis. This EIS is consistent with the intent, goals, and objectives of the Recovery Plan. There is no removal of suitable habitat, so there are no conflicts with Recovery Action 32 that request that land management agencies protect the high quality spotted owl habitat.

Special Status Species

The following table summarizes effects to Sensitive Species and rare and uncommon species from the Biological Evaluation that is incorporated by reference and found in the project record. Sensitive species are species listed under the R6 Regional Forester's Sensitive Species List (January 2008). Sensitive species are species that are restricted in range, have sensitive habitat, have been on the decline but do not warrant be listed as federally threatened or endangered. The intention of the Regional Forester's Sensitive List is to consider these species in land management decisions to ensure that their numbers do not decline to a point where they would become federally threatened or endangered.

Table 3-94. Summary of effects to sensitive, rare and uncommon species.

Species	Suitable Habitat Presence	Impact of Action Alternative*
Bald Eagle (Haliaeetus Leucocephalus)	No	No Impact
Oregon Slender Salamander (Batrachoseps wrightii)	Yes	No Impact
Larch Mountain Salamander (Plethodon larselli)	Yes	No Impact
Cope's Giant Salamander (Dicamptodon copei)	No	No Impact
Oregon Spotted Frog (Rana pretiosa)	No	No Impact
Bufflehead (Bucephala albeola)	No	No Impact
Harlequin Duck (Histrionicus histrionicus)	No	No Impact
American Peregrine Falcon (Falco peregrinus anatum)	No	No Impact
White-headed Woodpecker (Picoides albolarvatus)	Yes	MII-NLFL
Lewis' Woodpecker (Melanerpes Lewis)	Yes	MII-NLFL
Townsend's Big-eared bat (Corynorhinus townsendii)	Yes	MII-NLFL
Fringed Myotis (Myotis thysanodes)	Yes	MII-NLFL
California Wolverine (Gulo gulo luteus)	No	No Impact
Johnson's Hairstreak (Callophrys Johnsoni)	Yes	MII-NLFL
Mardon Skipper (Polites mardon)	No	No Impact
Puget Oregonian (Cryptomastix devia)**	Yes	No Impact
Columbia Oregonian (Cryptomastix hendersoni)**	Yes	No Impact
Evening Fieldslug (Deroceras hesperium)**	Yes	No Impact
Dalles Sideband (Monadenia fidelis minor)**	Yes	MII-NLFL
Crater Lake Tightcoil (Pristiloma arcticum crateris) **	Yes	MII-NLFL
Crowned Tightcoil (Pristiloma Pilsbryi)	Yes	No Impact
White-headed Woodpecker (Picoides albolarvatus)	Yes	MII-NLFL

"MII-NLFL" = May Impact Individuals, but not likely to Cause a Trend to Federal Listing or Loss of Viability to the Species

Effects to the species listed above include changes to habitat as well as potential harm to individuals caused by physical impacts of trail construction, repair, maintenance, OHV use both during night and day, staging area construction and maintenance, road decommissioning and staging area use.

The following sensitive species have habitat in the proposed OHV systems and are documented in more detail below. Further information can be found in the Wildlife Biological Evaluation found in the project record.

White-headed and Lewis' woodpecker

The roads and trails selected for OHV use have very little habitat for these two woodpeckers. Both woodpeckers do require snags and snags may be affected in a small way. Some hazard tree removal or if any new construction requires some removal of snags or ponderosa pine it could have a minor affect on these woodpeckers. The affect however would be below any threshold that would affect the feeding, breeding or behavior of these birds. *No white-headed or Lewis' woodpeckers were observed during surveys of potential new construction.* The loss of snags as danger trees however may cause a minor impact therefore the effect determination is **May Impact Individuals, but not Likely to Cause a Trend to Federal Listing or Viability to the Species**.

Johnson's Hairstreak Butterfly

This butterfly is present in areas of dwarf mistletoe and utilizes nearby openings. There is no proposal to remove stands of trees with dwarf mistletoe or alter meadows or openings that may be used by this butterfly so there are no anticipated effects to the butterfly. Mistletoe can kill trees and these trees may be considered a danger to riders and need to be removed, so the effect determination is **May Impact Individuals, but not Likely to Cause a Trend to Federal Listing or Viability to the Species**.

Terrestrial Mollusks

Due to the diversity of the locations and habitats that are crossed by trails in the OHV systems, at least one species may be found in the proposed OHV locations. Surveys were conducted in the spring of 2007 in areas of new construction. In most cases, there is already existing trail use by OHVs that has already altered habitat where potential mollusk could be found. Many of areas where there was no existing use (Peavine, LaDee, and Bear Creek) were surveyed and no rare mollusks were found. Several areas were identified for new alternatives after surveys were completed for the routes. There were no surveys for the western portions of the Rock Creek proposed OHV roads and trails and some of the McCubbins proposed OHV roads and trails. It is assumed, based on habitat, that there could be Dalles sideband and potentially Crater Lake tight coil snails in the unsurveyed locations (for new construction). Because these routes are narrow compared to the amount of habitat that exist adjacent to the trails it is possible that some individual Dalles sideband and Crater Lake tight coil mollusk could be affected by the new construction of these trails. That would make the effects determination for the Dalles sideband and Crater Lake tight coil mollusk **May Impact Individuals, but not likely to Cause a Trend to Federal Listing or Loss of Viability to the Species**.

In areas were there are existing trails, no surveys were required for these species due to lack of habitat. The following species were considered for surveys for this analysis due to habitat type: Crater Lake tightcoil, Puget Oregonian, Evening fieldslug, Dalles sideband, crowned tightcoil, and Columbia Oregonian.

Larch Mountain Salamander

The Bear Creek OHV system has potential habitat for Larch Mountain Salamander. Potential habitat for this salamander is areas near talus or rocky and porous soils. The areas of proposed new trail construction for the Bear Creek were surveyed in the spring of 2007. No salamanders were located during the surveys. There was one area found that had potential for Larch Mountain Salamanders. However, upon discussion with the Interdisciplinary Team, it was found that this site had other resource concerns; therefore, this trail was re-routed away from the potential habitat.

Oregon Slender Salamander

Oregon Slender Salamander occurs throughout the proposed OHV roads and trails. They are found under down logs, limbs, rocks, and bark. There is no change in the microclimate of the area where the trails occur from either the OHV use or any proposed trail construction. Most new trails construction would not remove any large woody debris or alter the micro climate because there is existing use currently at the locations. The exception is at the Bear Creek trails, but no Oregon Slender Salamanders were found in these proposed locations. If snags or trees are dropped for trail construction the down logs would remain in place and serve as habitat for these salamanders.

Fringed Bat and Townsend's Big-eared Bat

No substantial bat habitat would be altered by these OHV roads and trails. No effects are expected for Fringed or Townsend's big-eared bats from OHV trail use. There is a small possibility that a fringed bat could be under the bark of a snag that is a hazard tree along the trail and its roost location could be removed for safety reasons. Because the risk is very slight that this would happen, there are potentially minor effects to bats. The effect determination for bats is: **May Impact Individuals, but not Likely to Cause a Trend to Federal Listing or Viability to the Species**.

Effects of Other Rare or Uncommon Species

Rare or uncommon species are species that although are rare in a general locality they may or may not be listed as sensitive species. Red-tree voles have viable populations in much of their range but have a substantially lower population on the Forest. Therefore, they are listed as rare or uncommon.

Red-tree vole

Habitat for this species consists of conifer forests containing Douglas-fir, grand fir, Sitka spruce, western hemlock, and white fir. Optimal habitat for the species occurs in old-growth Douglas-fir forests. Large, live old-growth trees appear to be the most important habitat component. Red-tree voles are relatively uncommon in the North Cascades Region, with most records of species located at the lower elevations along the Columbia River and the western foothills of the Cascades. The species appears to be uncommon at elevations above 2,500 feet and extremely rare above 4,260 feet in the Cascades. It is believed that red tree voles are rare in high elevation true fir forests because their arboreal nests do not provide adequate insulation against cold winter temperatures. It is also thought that tree voles find it difficult to forage in high elevation forests during winter, when tree branches are frequently covered with snow and ice for extended periods (Forsman et al. 2004). There also have not been any records of red tree voles found from the east slope of the Cascades.

There are three proposed OHV systems that may have red-tree voles because these locations contain mature and old-growth stands. LaDee Flats, Peavine, and Bear Creek were considered areas where potential red-tree voles may be found. The OHV system where new construction is proposed was surveyed for red-tree voles in the spring of 2007. No red-tree voles, their nest, or Douglas fir resin ducts were discovered during the surveys, so there are no anticipated impacts to red-tree voles from the OHV trail construction or use, including road decommissioning.

Northwest Forest Plan Wildlife Requirements

The white-headed woodpecker, black-backed woodpecker, pigmy nuthatch, flammulated and great gray owls, and bats are species with standards and guidelines within the Northwest Forest Plan. There are no effects anticipated from OHV use or road decommissioning to any of these species.

- *White-headed woodpecker, pigmy nuthatch, and flammulated owl:* These three species are found generally in mature ponderosa pine habitat on the eastside of the Cascades. The project area does contain a small amount of ponderosa pine trees. No removal of ponderosa pine in the project area is anticipated, therefore there are no expected adverse affects to these species.

- *Black-backed woodpecker:* Habitat for this species is found in mixed conifer and lodgepole pine stands in the higher elevations of the Cascade Range. The project area has potential habitat for the species. A standard and guideline exists for this species that requires an adequate number of large snags and green-tree replacements for future snags be maintained in sufficient numbers to maintain 100 percent potential population levels. The 100 percent population potential for black-backed woodpeckers is 0.12 acres conifer snags per acre in the hard decay stage. These snags must be at least 17 inches dbh or largest available if 17 inches dbh snags are not available. The black-backed woodpecker also requires beetle infested trees for foraging.

  There would be a few snags removed periodically in the proposed OHV systems to reduce the hazards of snags falling on OHV riders. This would be a very small impact on the overall abundance and distribution of snags available for black-backed woodpecker use. The current rate of recruitment of snags from fire, insects, and disease on the eastside of the Forest where these species occur would far outweigh the amount of snags removed for hazard tree removal. Therefore, there is minimal adverse affects from OHV management to black-backed woodpeckers.

- *Great gray owl:* There is no potential habitat for the great gray owl in the proposed OHV route systems. Therefore, there are no anticipated adverse affects to great gray owls.

- *Bats:* The Northwest Forest Plan provides additional protection for caves, mines, abandoned wooden bridges and buildings that are being used as roost sites for bats. No caves, mines, abandoned wooden bridges or buildings are present within the OHV areas; therefore, these standards and guidelines and management recommendations do not apply.

Effects to Species and Focal Groups

It is not possible to quantify the actual impacts in terms of reproductive loss or harm to an individual or a population. An alternative approach for analysis is to compare the amount of exposure or risk to the species. More specifically, the analysis method is to compare the miles of roads and trails from one alternative to the others or to review the amount of exposure due to timing during critical breeding or survival periods. So the assessment of risk is used rather than the actual effect to identify which alternative has more or less impact than the other alternatives that are being analyzed. It is also not practical to attempt to analyze the effects of the alternatives to every species that might occur at the location but it is practical to look at representatives of these species that would characterize the effect to a whole group of species or a particular habitat designation, in the case of Late Successional Reserves. Table 3-93 shows the summary of analysis based on these criteria. Figures in the table are based on tables generated from GIS analysis done for these groups.

The table provides the best way of displaying the quantification of the potential impacts. Additional written analysis is provided to help clarify or add to the understanding of the impacts. The table shows a summary of the ranking for each alternative for each species group by OHV system.

Table 3-95. Summary of the effects of the alternatives to wildlife and LSR habitat.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
General Forest Area (including the current OHV routes)	Northern Spotted Owl	There is a potential for disruption of nesting owls throughout the Forest since OHVs can travel anywhere (1749 miles where cross-country OHV use is permitted 714 miles where OHV use is permitted on designated roads and trails 2463 miles of roads where OHV use is permitted) and there are no seasonal restrictions. There is no new construction; therefore, there are no impacts to spotted owl habitat.	There would be a substantial reduction in locations affected by disturbance in Alternative 2 (221 miles) than in Alternatives 1 (714 & 2463 miles) or 3 (326 miles), but more than Alternative 4 (96 miles). There would be 13 miles of road decommissioning included in this Alternative. There are 59 miles of new OHV trail construction, which could cause some minor impacts to spotted owl habitat from individual tree removal.	There would be a substantial reduction in locations affected by disturbance in Alternative 3 (326 miles) than in Alternatives 1 (714 & 2463 miles) and 2 (221 miles), but more than Alternative 4 (96 miles). There would be 35 miles of road decommissioning in this Alternative. There are 69 miles of new OHV trail construction, which could cause some minor impacts to spotted owl habitat from individual tree removal. This alternative has the greatest impact to spotted owl habitat.	There would be the greatest reduction in locations affected by disturbance in Alternative 4 (96 miles) compared to all other alternatives. There would be 12 miles of road decommissioning in this Alternative. There are nine miles of new OHV trail construction, which could cause some minor impacts to spotted owl habitat from individual tree removal. This alternative has the least impact to spotted owl habitat.	The following ranks the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 5. This ranking is based on least to most disturbance from miles of routes and road decommissioning.
	Sensitive, Rare and Uncommon Species	Because OHV use is scattered across the Forest, there are more opportunities for vehicle disturbance of both individuals and their habitat. This is especially true because, in addition to the roads and trails, the vehicles can go cross-country. The most likely impacts are from the small less mobile species, such as salamanders and mollusk. In this Alternative there could also be impacts to bald eagles and peregrine falcons as they expand their nesting distribution on the Forest to previously unoccupied areas.	The existing trails have already had impacts that removed habitat. This has reduced the impact to the small less mobile sensitive species. The main impacts would be on the 52 miles of trails that require new construction. Some of the new construction already has existing use. The Bear Creek OHV system has the most actual new construction. This is a major reduction in potential impacts to this group of species. New construction can impact mollusk. Based on habitat, the Dalles sideband and Crater Lake tightcoil are most susceptible to new construction.	The effect of this Alternative is similar to Alternative 2 with the exception that it has 59 miles of potential new construction impacts. New construction can impact mollusk. Based on habitat, the Dalles sideband and Crater Lake tightcoil are most susceptible to new construction.	The effect of this Alternative is similar to Alternatives 2 and 3 with the exception that it has only nine miles of potential new construction impacts. This Alternative has the least impacts to this group of species. New construction can impact mollusk. Based on habitat the Dalles sideband and Crater Lake tightcoil are most susceptible to new construction.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most amount of new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Management Indicator Species (Deer, elk, marten, pileated woodpecker, gray squirrel, and wild turkey)	OHVs have very little impact on pileated woodpeckers and martens. There is however a large effect on deer and elk. Vehicle traffic would cause deer and elk to avoid an area, thereby reducing their habitat utilization. This can also stress the animals at critical points since there are no major restrictions for OHV use and they can operate during winter and calving time frames. With OHV use across the Forest, hunting pressure is increased further than the road prism that gets the majority of hunting pressure. Nesting turkeys are subject to harassment by OHVs and some nests are probably lost each year from OHV use. This Alternative would have the highest loss potential.	Alternative 2 reduces the overall impact of OHVs on deer and elk substantially. It also increases the concentration of the effect to smaller areas and would make the trails and roads in this Alternative have a much greater impact to the local animals. Seasonal restrictions on these trails reduce the impacts to wintering calving and fawning. This Alternative would have the substantially less potential loss of turkey nest than Alternative 1.	Alternative 3 has a slightly higher impact to deer and elk use in the areas by having a higher amount of roads and constructing more trails than Alternative 2. However, this has a great deal less impact than Alternative 1. Seasonal restrictions on these trails reduce the impacts to wintering calving and fawning. The Alternative 3 would have the substantially less potential loss of turkey nest than Alternative 1, but greater than Alternatives 2 and 4.	Alternative 4 has the least impact to deer and elk due to the greatly reduced miles of roads and trails and less new construction. Seasonal restrictions on these trails reduce the impacts to wintering calving and fawning. This Alternative would have the least potential loss of turkey nest.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.
	Protection Buffer Species	The protection buffer species are not greatly affected by OHV use. Because they are arboreal species that are not directly impacted by OHV use.	The protection buffer species are not greatly affected by OHV use. Some snag loss may occur in areas of new construction or hazard tree removal.	The protection buffer species are not greatly affected by OHV use. Some snag loss may occur in areas of new construction or hazard tree removal, which would be greatest in this Alternative.	The protection buffer species are not greatly affected by OHV use. Some snag loss may occur in areas of new construction or hazard tree removal, but would be least in this Alternative.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 1 2. Alternative 4 3. Alternative 2 4. Alternative 3 This ranking is based on the least amount of potential hazard tree (snags) removal.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Land Birds	Some ground nesting and low nesting birds would abandon nest when a large amount of OHV use happens in close proximity. This Alternative has the greatest impact because a large degree of habitats are affected over a large land mass. There is no habitat removal however that would directly take out a nest.	This Alternative would have much less impact from disturbance than Alternative 1, but would have more impact from new construction and maintenance.	This Alternative would have much less impact from disturbance than Alternative 1, but more than Alternatives 2 and 4. This Alternative would have the greatest impact from new construction and maintenance.	This Alternative would have the least impact from disturbance than Alternative 1 and would have the least impact from new construction and maintenance.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.
Peavine	Northern Spotted Owl	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be 9.4 miles of OHV routes in suitable spotted owl habitat. There would be 1.9 miles of newly constructed trails that could impact spotted owl habitat.	There would be 18.7 miles of OHV routes in suitable spotted owl habitat. There would be 8.8 miles of newly constructed trails that could impact spotted owl habitat.	There would be no OHV routes in suitable spotted owl habitat. There would be no new construction in spotted owl habitat.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most disturbance from miles of routes.
	Sensitive, Rare and Uncommon Species	There is some potential mollusk and Oregon Slender salamander habitat in the Peavine system. There is not much impact to these species on the existing trails. No impacts would occur to Red-tree voles from OHV use.	Surveys in areas of new construction did not detect any sensitive, rare, or uncommon species. There would be fewer impacts (1.0 miles of new construction) in this location than Alternative 1 because the OHV roads and trails would be confined to a smaller number of trails.	There would be 6.8 miles more new construction in this Alternative and may have more potential to affect sensitive, rare, or uncommon species habitat.	This alternative protects habitat from OHV use in this location. Although the impacts from other Alternatives would have minor effects on this group of species this Alternative is best for minimizing impacts. There are no newly created routes or trails in this alternative.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most amount of new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Management Indicator Species (Deer, elk, marten, pileated woodpecker, gray squirrel, and wild turkey)	Alternative 1 creates impacts to MIS species across the Forest at all times of the year. The impacts are mostly in the form of harassment or disturbance. Road Density= 3.50 mi. road/mi2	Alternative 2 has three miles of new construction that could impact snag resources to a small extent. It would reduce impacts to deer, elk, and wild turkeys by eliminating harassment during 75-80 percent of the fawning period and all of the elk calving period as well as turkey nesting season. This Alternative would have the substantially less potential loss of turkey nest than Alternative 1. There would be 34.5 miles of OHV routes in winter range and 41 miles in summer range. Road Density= 3.20 mi. road/mi2	Alternative 3 has six miles more new construction than Alternative 2, so there would be more potential snags lost by this Alternative. The seasonal restriction has the same impact as Alternative 2 for deer, elk and turkeys. The Alternative 3 would have the substantially less potential loss of turkey nest than Alternative 1, but greater than Alternatives 2 and 4. There would be 1.8 miles of OHV routes in winter range and 48.8 miles in summer range. Road Density= 3.46 mi. road/mi2	Alternative 4 would protect habitat for woodpeckers, martens, and removes the impacts of OHVs during the calving, fawning, and turkey nesting season. This Alternative would have the least potential loss of turkey nest. There would be no OHV routes in winter and summer range. Road Density= 3.20 mi. road/mi2	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.
	Protection Buffer Species	There are insignificant effects to this group of species from OHVs. Snags are rarely affected in this Alternative.	The three miles of new construction may have minor effects on snags for these eastside species.	There are three times the potential for snag removal from this Alternative that could have minor effects for this group of snag using species.	There would be no effects to this group of species from this Alternative.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least amount of potential hazard tree (snags) removal.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Land Birds	Alternative 1 has some effect on land birds. OHVs cause nest disturbance and nest abandonment in some situations.	Alternative 2 would reduce the amount of OHV routes from Alternative 1, so there would be a reduction in nest abandonment due to the smaller area of impact. New construction (1.9 mi) however may cause some nesting losses during the construction year.	Alternative 3 would increase the amount of potential nest abandonment by increasing the miles of trail by 12 miles and increasing new construction disruption of nesting by an additional 6.8 miles of routes.	Alternative 4 would eliminate land bird losses from nest abandonment from OHV use.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.
	LSR	Alternative one would have potential OHV use throughout the system of LSRs. This could disturb and affect late successional species through disruption and traffic.	This Alternative would have no OHV trails in LSR. There would be about 0.52 miles of OHV trails in LSR-100s.	Alternative 3 would have 1.75 miles of OHV trails in LSR and 2 miles in LSR-100s.	Alternative 4 would have no miles of OHV trails in LSR and LSR-100s.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternatives 4 and 2 2. Alternative 3 3. Alternative 1 This ranking is based on the least amount of routes in LSR and LSR-100s to the greatest.
LaDee Flats	Northern Spotted Owl	Entire area is open to OHVs. This area is primarily dispersal habitat for spotted owls. OHVs currently use this area illegally and extensively. There is no major effect to spotted owls in this or any alternative due to no nesting owls in the areas of use.	There would be 5.7 miles of OHV trails in suitable spotted owl habitat. Only minor impacts to dispersing spotted owls would occur from this alternative. New construction is in dispersal habitat and would not impact owls.	There would be 7.4 miles of OHV trails in suitable spotted owl habitat. Only minor impacts to dispersing spotted owls would occur from this alternative. New construction is in dispersal habitat and would not impact owls.	There would be 0.5 miles of OHV trails in suitable spotted owl habitat. Only minor impacts to dispersing spotted owls would occur from this alternative. New construction is in dispersal habitat and would not impact owls.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most disturbance from miles of routes and road decommissioning.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Sensitive, Rare and Uncommon Species	No habitat for sensitive, rare, or uncommon species is in this area. Surveys did not find any species or suitable habitat.	No habitat for sensitive, rare, or uncommon species is in this area. Surveys did not find any species or suitable habitat.	No habitat for sensitive, rare, or uncommon species is in this area. Surveys did not find any species or suitable habitat.	No habitat for sensitive, rare, or uncommon species is in this area. Surveys did not find any species or suitable habitat.	No impacts.
	Management Indicator Species (Deer, elk, marten, pileated woodpecker, gray squirrel, and wild turkey)	Marginal habitat for all MIS species. Current illegal use may cause some disturbance to deer and elk. Illegal use is actually high in this area. Road Density= 2.27 mi. road/mi2	There would be fewer disturbances to deer and elk from OHV use than Alternatives 1 and 4. There would be 38.9 miles of OHV routes in winter range and 17.1 miles in summer range. Road Density= 2.25 mi. road/mi2 No turkeys present.	Alternative 3 would have the highest amount of disturbance to deer and elk in this marginal habitat. There would be 30 miles of OHV routes in winter range and 16.9 miles in summer range. Road Density= 2.33 mi. road/mi2 No turkeys present.	Alternative 4 would have the least disturbance to deer and elk in this marginal habitat. There would be 30 miles of OHV routes in winter range and 0.3 miles in summer range. Road Density= 2.31 mi. road/mi2 Not turkeys present.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.
	Protection Buffer Species	No protection buffer species in this location.	No protection buffer species in this location.	No protection buffer species in this location.	No protection buffer species in this location.	No impacts.
	Land Birds	Alternative 1 current use (illegal) causes disruption of nesting and nesting loss in the areas used by OHVs.	Alternative 2 would authorize use in this location, so the loss of nesting would increase over the 39 miles of trails.	Alternative 3 would authorize use in this location, so the loss of nesting would increase over the 42 miles of trails. There would be three more miles where disturbance could occur.	Alternative 4 would authorize use in this location, so the loss of nesting would increase over the 25 miles of trails. There would be 14 miles less where disturbance could occur than the Alternative 2.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	LSR	Alternative one would have potential OHV use throughout the system of LSRs. This could disturb and affect late successional species through disruption and traffic.	Alternative 2 would have 14.2 miles of OHV trails in LSR and no miles in LSR-100s.	Alternative 3 would have 14.4 miles of OHV trails in LSR and no miles in LSR-100s.	Alternative 4 would have 0.2 miles of trails in LSR and no miles in LSR-100s.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least amount of routes in LSR and LSR-100s to the greatest.
Bear Creek	Northern Spotted Owl	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be 6.4 miles of OHV roads and trails in suitable spotted owl habitat. There are 39 miles of newly constructed trails with this alternative that may impact some suitable habitat.	There would be 6.4 miles of OHV roads and trails in suitable spotted owl habitat. There are 28 miles of newly constructed trails with this alternative that may impact some suitable habitat.	There would be no miles of OHV roads and trails in suitable spotted owl habitat. There are no newly created trails that would impact spotted owl habitat.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most disturbance from miles of routes.
	Sensitive, Rare and Uncommon Species	Alternative 1 has some potential to impact wolverine, Larch Mountain Salamander, and mollusk because of unrestricted OHV use both spatially and temporally.	Impacts from Alternative 2 would be reduced by seasonal restrictions and moving trails to avoid habitat impacts. No target species would be affected by new construction as observed during surveys.	Impacts from Alternative 3 would be reduced by seasonal restrictions and moving trails to avoid habitat impacts. No target species would be affected by new construction as observed during surveys. Less construction impacts than Alt 2.	The least impact from OHV due to elimination of routes at this site.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most amount of new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Management Indicator Species (Deer, elk, marten, pileated woodpecker, gray squirrel, and wild turkey)	Alternative 1 has some potential to impact deer, and elk because of unrestricted OHV use both spatially and temporally. The area is used as deer and elk summer range and production area. Road Density= 1.70 mi. road/mi2	Impacts from Alt 2 would be reduced by seasonal restrictions. The new construction would increase impacts to this area from harassment and lower production. It may also increase the vehicle/animal collisions from current condition in this area. There would be no miles of OHV routes in winter range and 39 miles in summer range. Road Density= 1.90 mi. road/mi2 No turkeys present.	Impacts from Alternative 3 would be reduced by seasonal restrictions. The new construction would increase impacts to this area from harassment and lower production. It may also increase the vehicle/animal collisions from current condition in this area. There would be no miles of OHV routes in winter range and 40 miles in summer range. Road Density= 1.89 mi. road/mi2 No turkeys present.	Alternative 4 would eliminate impacts to MIS species. There would be no OHV routes in winter and summer range. Road Density= 1.69 mi. road/mi2 No turkeys present.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.
	Protection Buffer Species	This area is outside the normal range for protection buffer species.	This area is outside the normal range for protection buffer species.	This area is outside the normal range for protection buffer species.	This area is outside the normal range for protection buffer species.	No impacts.
	Land Birds	The unrestricted season for OHV use in this Alternative creates impacts to nesting land birds. It may be a minor effect because use in this area appears lower than other areas, based on visual evidence.	The seasonal restriction for OHV use would reduce nest abandonment be moving use outside of much of the breeding season and allowing nest to be well established where adults are less likely to abandon the nest. More construction than Alt 3 means that there is a slight increase in construction nest losses but a lower amount of overall trails would reduce the long term effects by one mile.	The seasonal restriction for OHV use would reduce nest abandonment be moving use outside of much of the breeding season and allowing nest to be well established where adults are less likely to abandon the nest. Less construction than Alt 2 means that there is a slight decrease in construction nest losses but a higher amount of overall trails would increase the long term effects by one mile.	Alternative 4 would eliminate impacts to land birds.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.
	LSR	Alternative one would have potential OHV use throughout the system of LSRs. This could disturb and affect late successional species through disruption and traffic.	There would be no OHV routes in LSR and 0.58 miles in LSR-100s.	There would be no OHV routes in LSR and 0.58 miles in LSR-100s.	There would be no OHV routes in LSR and LSR-100s.	No impacts.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
Gibson Prairie	Northern Spotted Owl	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be 3.4 miles of OHV roads and trails in suitable spotted owl habitat. There are 4.3 miles of newly constructed trails that could impact spotted owl habitat.	There would be 0.7 miles of OHV roads and trails in suitable spotted owl habitat. There are 0.3 miles of newly created trails being by this alternative.	There would be no miles of OHV roads and trails in suitable spotted owl habitat. There are no newly created trails being created by this alternative.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 3 3. Alternative 2 4. Alternative 1 This ranking is based on the least to most disturbance from miles of routes and road decommissioning.
	Sensitive, Rare and Uncommon Species	Alternative 1 allows unrestricted use of OHVs in this area both spatially and temporally. No target species were found during surveys in this area but OHVs may travel outside of currently used trails in this Alternative so some minor impacts could occur.	No target species were located during surveys in areas of new construction. No impacts to this group of species is expected from this alternative.	No target species were located during surveys in areas of new construction. No impacts to this group of species is expected from this alternative.	No impacts to this group of species is expected from this alternative.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 3 3. Alternative 2 4. Alternative 1 No impacts expected but a rare incident could occur. This ranking is based on the least to most amount of new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Management Indicator Species (Deer, elk, marten, pileated woodpecker, gray squirrel, and wild turkey)	No anticipated impacts to pileated woodpeckers or marten. Ongoing impacts to deer, elk, and turkey in this area of known production area especially for deer. Some breeding impacts due to no restrictions spatially or temporally. Road Density= 0.13 mi. road/mi2	Alternative 2 would reduce impacts to deer, elk, and turkey by limiting routes to 15 miles and restricting use during 75-80 percent of the fawning season for deer and 100 percent for elk and turkey. There would be 9 miles of OHV routes in winter range and 15 miles in summer range. Road Density= 0.11 mi. road/mi2 This Alternative would have the substantially less potential loss of turkey nest than Alternative 1.	Alternative 3 would reduce impacts to deer, elk, and turkey by limiting routes to 5 miles and restricting use during 75-80 percent of the fawning season for deer and 100 percent for elk and turkey. There would be 1 mile of OHV routes in winter range and 5 miles in summer range. Road Density= 0.13 mi. road/mi2 The Alternative 3 would have the substantially less potential loss of turkey nest than Alternative 1, but greater than Alternatives 2 and 4.	Alterative 4 would eliminate OHV harassment to deer and elk. There would be no OHV routes in summer and winter range. Road Density= 0.11 mi. road/mi2 This Alternative would have the least potential loss of turkey nest.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 3 3. Alternative 2 4. Alternative 1 This ranking is based on the least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.
	Protection Buffer Species	Some protection buffer species occur in this area but are not affected by OHV use.	Some protection buffer species occur in this location but are not affected by OHV use. New construction may reduce snags used by protection buffer species. Four miles of potential impact for Alt 2.	Some protection buffer species occur in this location but are not affected by OHV use. New construction may reduce snags used by protection buffer species. One mile of potential impact for Alt 3.	No impacts.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 3 3. Alternative 2 4. Alternative 1 This ranking is based on the least amount of potential hazard tree (snags) removal.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Land Birds	OHV use is unrestricted spatially and temporally so there would be some nest abandonment from disruption.	Alternative 2 restricts OHV use to 15 miles of trails and restricts the timing of use to allow for many birds to fledge. The four miles of new construction could impact some nesting birds.	Alternative 3 restricts OHV use to 5 miles of trails and restricts the timing of use to allow for many birds to fledge. The <1 miles of new construction could impact some nesting birds.	No impacts.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 3 3. Alternative 2 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.
	LSR	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be no OHV routes in LSR and LSR-100s.	There would be no OHV routes in LSR and LSR-100s.	There would be no OHV routes in LSR and LSR-100s.	No impacts.
McCubbins Gulch	Northern Spotted Owl	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be 8.7 miles of OHV roads and trails in suitable spotted owl habitat. There would be one known site within disruption distance. There are 2.4 miles of newly created trails in this alternative these may cause some minor impacts to spotted owl habitat.	There would be 10 miles of OHV roads and trails in suitable spotted owl habitat. There would be one known site within disruption distance. There are 11 miles of newly created trails in this alternative these may cause some minor impacts to spotted owl habitat.	There would be 6.6 miles of OHV roads and trails in suitable spotted owl habitat. There would be one known site within disruption distance. There are 0.7 miles of newly created trails in this alternative these may cause some minor impacts to spotted owl habitat.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most disturbance from miles of routes and road decommissioning.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Sensitive, Rare and Uncommon Species	This relatively flat area lends itself to OHV use that is unrestricted in this alternative. There are some impacts to low mobility target species from off trail travel, although minor.	Alternative 2 restricts the OHV use to 51 miles of routes. No target species were found during surveys. New construction can impact mollusk. Based on habitat the Dalles sideband and Crater Lake tightcoil are most susceptible to new construction. There is 2.4 miles of newly constructed trails in this alternative.	Alternative 3 restricts the OHV use to 60 miles. New construction can impact mollusk. Based on habitat the Dalles sideband and Crater Lake tightcoil are most susceptible to new construction. There is 11 miles of newly constructed trails in this alternative.	Alternative 4 restricts the OHV use to 34 miles of routes. New construction can impact mollusk. Based on habitat the Dalles sideband and Crater Lake tightcoil are most susceptible to new construction. There is 0.7 miles of newly constructed trails in this alternative.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most amount of new construction.
	Management Indicator Species (Deer, elk, marten, pileated woodpecker, gray squirrel, and wild turkey)	This area has a fair amount of deer, elk, and turkeys and a high amount of current OHV use that impacts wildlife utilization of that due to the unrestricted area of OHV use. Most wildlife use is summer range with a small amount of winter range. Road Density= 3.81 mi. road/mi2	Alternative 2 would reduce the area of use to 51 miles of trail. The concentrated use would put higher pressure on a smaller area but would reduce current harassment in the areas without designated trails. This Alternative would have the substantially less potential loss of turkey nest than Alternative 1. There would be 31 miles of OHV routes in winter range and 50 miles in summer range. Road Density= 3.76 mi. road/mi2	Alt 3 would reduce the area of use to 60 miles of trail. The concentrated use would put higher pressure on a smaller area but would reduce current harassment in the areas without designated trails. This Alt has 9 miles more harassment issues than Alt 2. The Alternative 3 would have the substantially less potential loss of turkey nest than Alternative 1, but greater than Alternatives 2 and 4. There would be 28 miles of OHV routes in winter range and 56 miles in summer range. Road Density= 3.82 mi. road/mi2	Alternative 4 would reduce the area of use to 34 miles of trail. The concentrated use would put higher pressure on a smaller area but would reduce current harassment in the areas without designated trails. This Alternative has 17 miles less harassment issues than Alternative 2. This is the least impact to this group of all of the Alternatives. This Alternative would have the least potential loss of turkey nest. There would be 15 miles of OHV routes in winter range and 33 miles in summer range. Road Density= 3.71 mi. road/mi2	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Protection Buffer Species	This area has potential habitat for all of our protection buffer species. There is very little impact to this group of species from OHV use by itself. The occasional loss of snags for safety is the only impact to this group.	The 5 miles of new construction may remove some snags but a lot of the new construction areas are in areas of current user created trails and so no trees would actually be removed.	The 14 miles of new construction may remove some snags but a lot of the new construction areas are in areas of current user created trails and so no trees would actually be removed.	The 1 mile of new construction may remove some snags but a lot of the new construction areas are in areas of current user created trails and so no trees would actually be removed.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least amount of potential hazard tree (snags) removal.
	Land Birds	The unrestricted use of OHVs in this area creates nest disruptions occasionally from OHVs flushing ground nesting birds as they pass by the nest.	Alternative 2 would restrict the OHV nest disruption to 51 miles of trails.	Alterative 3 would restricts\ the OHV nest disruption to 60 miles of trails.	Alternative 4 would restrict the OHV nest disruption to 34 miles of trails.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.
	LSR	Alternative one would have potential OHV use throughout the system of LSRs. This could disturb and affect late successional species through disruption and traffic.	There would be 7.8 miles of OHV routes in LSR and 2.1 miles in LSR-100s.	There would be 7.9 miles of OHV routes in LSR and 1.1 miles in LSR-100s.	There would be 6.4 miles of OHV routes in LSR and one mile in LSR-100s.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 3 3. Alternative 2 4. Alternative 1 This ranking is based on the least amount of routes in LSR and LSR-100s to the greatest.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
Rock Creek	Northern Spotted Owl	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be 10 miles of OHV roads and trails in suitable spotted owl habitat. There would be two known sites within disruption distance. There are 2.9 miles of newly constructed trails in this alternative that could impact spotted owl habitat.	There would be 25.6 miles of OHV roads and trails in suitable spotted owl habitat. There would be one known site within disruption distance. There are 5.8 miles of newly constructed trails in this alternative that could impact spotted owl habitat.	There would be 13.9 miles of OHV roads and trails in suitable spotted owl habitat. There would be one known site within disruption distance. There are 3.0 miles of newly constructed trails in this alternative that could impact spotted owl habitat.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 2 2. Alternative 4 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most disturbance from miles of routes, road decommissioning, and nest disruption distances.
	Sensitive, Rare and Uncommon Species	Slight potential impacts to rare mollusk and Oregon Slender Salamander from unrestricted cross-country OHV travel. Minor impacts to individuals.	Alternative 2 would reduce impacts to this group to 2.9 miles of newly constructed trails. New construction can impact mollusk. Based on habitat the Dalles sideband and Crater Lake tightcoil are most susceptible to new construction. It would reduce off trail use that can happen in Alt 1.	Alternative 3 would reduce impacts to this group to 5.8miles of newly constructed trails. New construction can impact mollusk. Based on habitat the Dalles sideband and Crater Lake tightcoil are most susceptible to new construction. It would reduce off trail use that can happen in Alt 1.	Alternative 4 would reduce impacts to this group to 3 of newly constructed trails. New construction can impact mollusk. Based on habitat the Dalles sideband and Crater Lake tightcoil are most susceptible to new construction. It would reduce off trail use that can happen in Alt 1.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on least to most amount of new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Management Indicator Species (Deer, elk, marten, pileated woodpecker, gray squirrel, and wild turkey)	This area is Deer and Elk winter range. The unrestricted use of the area can impacts deer, elk, and turkey during critical times. Harassment during the winter can lower survival and reproduction. Road Density= 2.50 mi. road/mi2	Alternative 2 would reduce impacts to MIS species by reducing OHV use to 40 miles of trails and restricting the season of use to outside of the critical wintering period. This Alternative would have the substantially less potential loss of turkey nest than Alternative 1. There would be 36 miles of OHV routes in winter range and 30 miles in summer range. Road Density= 2.55 mi. road/mi2	Alternative 3 would reduce impacts to MIS species by reducing OHV use to 60 miles of trails and restricting the season of use to outside of the critical wintering period. The Alternative 3 would have the substantially less potential loss of turkey nest than Alternative 1, but greater than Alternatives 2 and 4. There would be 21 miles of OHV routes in winter range and 50 miles in summer range. Density= 2.44 mi. road/mi2	Alternative 4 would reduce impacts to MIS species by reducing OHV use to 37 miles of trails and restricting the season of use to outside of the critical wintering period. This Alternative would have the least potential loss of turkey nest. There would be 1.3 miles of OHV routes in winter range and 39 miles in summer range. Density= 2.38 mi. road/mi2	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 3 3. Alternative 2 4. Alternative 1 The seasonal restriction reduces the importance of harassment in winter range. This ranking is based on least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.
	Protection Buffer Species	This area has potential habitat for all of our protection buffer species. There is very little impact to this group of species from OHV use by itself. The occasional loss of snags for safety is the only impact to this group.	The 6 miles of new construction may remove some snags but a lot of the new construction areas are in areas of current user created trails and so no trees would actually be removed.	The 7 miles of new construction may remove some snags but a lot of the new construction areas are in areas of current user created trails and so no trees would actually be removed.	The 3 miles of new construction may remove some snags but a lot of the new construction areas are in areas of current user created trails and so no trees would actually be removed.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least amount of potential hazard tree (snags) removal.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Land Birds	The unrestricted use of OHVs in this area creates nest disruptions occasionally from OHVs flushing ground nesting birds as they pass by the nest.	Alternative 2 would restrict the OHV nest disruption to 40 miles of trails.	Alternative 3 would restrict the OHV nest disruption to 61 miles of trails.	Alternative 4 would restrict the OHV nest disruption to 37 miles of trails.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.
	LSR	Alternative one would have potential OHV use throughout the system of LSRs. This could disturb and affect late successional species through disruption and traffic.	There would be no OHV routes in LSR and 1.7 miles in LSR-100s.	There would be 0.8 miles of OHV routes in LSR and 1.4 miles in LSR-100s.	There would be no OHV routes in LSR and 0.7 miles in LSR-100s.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least amount of routes in LSR and LSR-100s to the greatest.
Graham Pass	Northern Spotted Owl	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be no OHV routes in suitable spotted owl habitat.	There would be 18.6 miles of OHV routes in suitable spotted owl habitat.	There would be no OHV routes in suitable spotted owl habitat.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternatives 4 and 2 2. Alternative 3 3. Alternative 1 Rational- Based on least to most disturbance from miles of routes.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Sensitive, Rare and Uncommon Species	Some occasional off road use can occur currently so there is some low level of potential impact. Most use in this area is probably for game retrieval.	No use of roads for OHVs can occur. No impacts to this group of species is expected. Less impacts than Alt 1 since no OHVs can be used here.	Use is confined existing gravel roads. No impacts to this group of species is expected.	No use of roads for OHVs can occur. No impacts to this group of species is expected. Less impacts than Alt 1 since no OHVs can be used here.	No impacts
	Management Indicator Species (Deer, elk, marten, pileated woodpecker, gray squirrel, and wild turkey)	Some occasional off road use can occur currently so there is some low level of potential impact. Most use in this area is probably for game retrieval. No Turkeys in this area Density= 3.50 mi. road/mi2 .	No use of roads for OHVs can occur. No impacts to this group of species is expected. Less impacts than Alt 1 since no OHVs can be used here. No Turkeys in this area There would be no OHV routes in winter and summer range. Density= 3.20 mi. road/mi2	Use is confined existing gravel roads. No impacts to this group of species is expected. No Turkeys in this area There would be no OHV routes in winter range and 64 miles in summer range. Density= 3.46 mi. road/mi2	No use of roads for OHVs can occur. No impacts to this group of species is expected. Less impacts than Alt 1 since no OHVs can be used here. No Turkeys in this area There would no OHV routes in winter and summer range. Density= 3.20 mi. road/mi2	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternatives 4 and 2 2. Alternative 3 3. Alternative 1 Rational- Based on least to most wildlife harassment (less miles of routes)and reduction in snags from danger tree removal need.
	Protection Buffer Species	No protection buffer species use this area.	No protection buffer species use this area.	No protection buffer species use this area.	No protection buffer species use this area.	No impacts
	Land Birds	Some occasional off road use can occur currently so there is some low level of potential impact. Most use in this area is probably for game retrieval.	No use of roads for OHVs can occur. No impacts to this group of species is expected. Less impacts than Alt 1 since no OHVs can be used here.	Use is confined existing gravel roads. No impacts to this group of species is expected.	No use of roads for OHVs can occur. No impacts to this group of species is expected. Less impacts than Alt 1 since no OHVs can be used here.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternatives 4 and 2 2. Alternative 3 3. Alternative 1 Rational- Based on the amount of nest disruption (miles of routes) and new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	LSR	Alternative one would have potential OHV use throughout the system of LSRs. This could disturb and affect late successional species through disruption and traffic.	There would be no OHV routes in LSR and LSR-100s.	There would be no OHV routes in LSR and 1.7 miles in LSR-100s.	There would be no OHV routes in LSR and LSR-100s.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternatives 4 and 2 2. Alternative 3 3. Alternative 1 Rational- The least amount of routes in LSR and LSR-100s to the greatest.
Mt Defiance	Northern Spotted Owl	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be no OHV routes in suitable spotted owl habitat.	There would be 2 miles of OHV routes in suitable spotted owl habitat.	There would be no OHV routes in suitable spotted owl habitat.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternatives 4 and 2 2. Alternative 3 3. Alternative 1 Rational- Based on least to most disturbance from miles of routes.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Sensitive, Rare and Uncommon Species	Some occasional off road use can occur currently so there is some low level of potential impact. Most use in this area is probably for game retrieval.	No use of roads for OHVs can occur. No impacts to this group of species is expected. Less impacts than Alt 1 since no OHVs can be used here.	Use is confined existing gravel roads. No impacts to this group of species is expected.	No use of roads for OHVs can occur. No impacts to this group of species is expected. Less impacts than Alt 1 since no OHVs can be used here.	No impacts
	Management Indicator Species (Deer, elk, marten, pileated woodpecker, gray squirrel, and wild turkey)	Some occasional off road use can occur currently so there is some low level of potential impact. Most use in this area is probably for game retrieval. No Turkeys in this area Road Density= 1.00 mi. road/mi2	No use of roads for OHVs can occur. No impacts to this group of species is expected. Less impacts than Alt 1 since no OHVs can be used here. No Turkeys in this area There would be no OHV routes in summer and winter range. Road Density= 0.93 mi. road/mi2	Use is confined existing gravel roads. No impacts to this group of species is expected. No Turkeys in this area There would be no OHV routes in winter range and 5.5 miles in summer range. Road Density= 1.00 mi. road/mi2	No use of roads for OHVs can occur. No impacts to this group of species is expected. Less impacts than Alt 1 since no OHVs can be used here. No Turkeys in this area Road Density= 0.93 mi. road/mi2	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternatives 4 and 2 2. Alternative 3 3. Alternative 1 Rational- Based on least to most wildlife harassment (less miles of routes)and reduction in snags from danger tree removal need.
	Protection Buffer Species	No protection buffer species use this area.	No protection buffer species use this area.	No protection buffer species use this area.	No protection buffer species use this area.	No impacts
	Land Birds	Some occasional off road use can occur currently so there is some low level of potential impact. Most use in this area is probably for game retrieval.	No use of roads for OHVs can occur. No impacts to this group of species is expected. Less impacts than Alt 1 since no OHVs can be used here	Use is confined existing gravel roads. No impacts to this group of species is expected.	No use of roads for OHVs can occur. No impacts to this group of species is expected. Less impacts than Alt 1 since no OHVs can be used here	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternatives 4 and 2 2. Alternative 3 3. Alternative 1 Rational- Based on the amount of nest disruption (miles of routes) and new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	LSR	Alternative one would have potential OHV use throughout the system of LSRs. This could disturb and affect late successional species through disruption and traffic.	There would be no OHV routes in LSR and LSR-100s.	There would be 0.2 miles of OHV routes in LSR and no OHV routes in LSR-100s.	There would be no OHV routes in LSR and LSR-100s.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternatives 4 and 2 2. Alternative 3 3. Alternative 1 Rational- The least amount of routes in LSR and LSR-100s to the greatest.
General Forest Area	Northern Spotted Owl	There is a potential for disruption of nesting owls throughout the Forest since OHVs can travel anywhere (2,463 miles of roads available) and there are no seasonal restrictions. There is no new construction; therefore, there are no impacts to spotted owl habitat.	There would be a substantial reduction in locations affected by disturbance in Alternative 2 (221 miles) than in Alternatives 1 (2,463 miles) or 3 (326 miles), but more than Alternative 4 (96 miles). There would be 13 miles of road decommissioning included in this Alternative. There are 59 miles of new OHV trail construction, which could cause some minor impacts to spotted owl habitat from individual tree removal.	There would be a substantial reduction in locations affected by disturbance in Alternative 3 (326 miles) than in Alternatives 1 (2,463 miles) and 2 (221 miles), but more than Alternative 4 (96 miles). There would be 35 miles of road decommissioning in this Alternative. There are 69 miles of new OHV trail construction, which could cause some minor impacts to spotted owl habitat from individual tree removal. This alternative has the greatest impact to spotted owl habitat.	There would be the greatest reduction in locations affected by disturbance in Alternative 4 (96 miles) compared to all other alternatives. There would be 12 miles of road decommissioning in this Alternative. There are nine miles of new OHV trail construction, which could cause some minor impacts to spotted owl habitat from individual tree removal. This alternative has the least impact to spotted owl habitat.	The following ranks the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on least to most disturbance from miles of routes and road decommissioning.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Sensitive, Rare and Uncommon Species	Because OHV use is scattered across the Forest, there are more opportunities for vehicle disturbance of both individuals and their habitat. This is especially true because, in addition to the roads and trails, the vehicles can go cross-country. The most likely impacts are from the small less mobile species, such as salamanders, Baird's shrew and mollusk. In this Alternative there could also be impacts to bald eagles and peregrine falcons as they expand their nesting distribution on the Forest to previously unoccupied areas.	The existing trails have already had impacts that removed habitat. This has reduced the impact to the small less mobile sensitive species. The main impacts would be on the 59 miles of trails that require new construction. Some of the new construction already has existing use. The Bear Creek OHV system has the most actual new construction. This is a major reduction in potential impacts to this group of species.	The effect of this Alternative is similar to Alternative 2 with the exception that it has 69 miles of potential new construction impacts.	The effect of this Alternative is similar to Alternatives 2 and 3 with the exception that it has only nine miles of potential new construction impacts. This Alternative has the least impacts to this group of species.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most amount of new construction.
	Management Indicator Species	OHVs have very little impact on pileated woodpeckers and martens. There is however a large effect on deer and elk. Vehicle traffic would cause deer and elk to avoid an area, thereby reducing their habitat utilization. This can also stress the animals at critical points since there are no major restrictions for OHV use and they can operate during winter and calving time frames. With OHV use across the Forest, hunting pressure is increased further than the road prism that gets the majority of hunting pressure. Nesting turkeys are subject to harassment by OHVs and some nests are probably lost each year from OHV use. This Alternative would have the highest loss potential.	Alternative 2 reduces the overall impact of OHVs on deer and elk substantially. It also increases the concentration of the effect to smaller areas and would make the trails and roads in this Alternative have a much greater impact to the local animals. Seasonal restrictions on these trails reduce the impacts to wintering calving and fawning. This Alternative would have the substantially less potential loss of turkey nest than Alternative 1.	Alternative 3 has a slightly higher impact to deer and elk use in the areas by having a higher amount of roads and constructing more trails than Alternative 2. However, this has a great deal less impact than Alternative 1. Seasonal restrictions on these trails reduce the impacts to wintering calving and fawning. The Alternative 3 would have the substantially less potential loss of turkey nest than Alternative 1, but greater than Alternatives 2 and 4.	Alternative 4 has the least impact to deer and elk due to the greatly reduced miles of roads and trails and less new construction. Seasonal restrictions on these trails reduce the impacts to wintering calving and fawning. This Alternative would have the least potential loss of turkey nest.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Protection Buffer Species	The protection buffer species are not greatly affected by OHV use. Because they are arboreal species that are not directly impacted by OHV use.	The protection buffer species are not greatly affected by OHV use. Some snag loss may occur in areas of new construction or hazard tree removal.	The protection buffer species are not greatly affected by OHV use. Some snag loss may occur in areas of new construction or hazard tree removal, which would be greatest in this Alternative.	The protection buffer species are not greatly affected by OHV use. Some snag loss may occur in areas of new construction or hazard tree removal, but would be least in this Alternative.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 1 2. Alternative 4 3. Alternative 2 4. Alternative 3 This ranking is based on the least amount of potential hazard tree (snags) removal.
	Land Birds	Some ground nesting and low nesting birds would abandon nest when a large amount of OHV use happens in close proximity. This Alternative has the greatest impact because a large degree of habitats are affected over a large land mass. There is no habitat removal however that would directly take out a nest.	This Alternative would have much less impact from disturbance than Alternative 1, but would have more impact from new construction and maintenance.	This Alternative would have much less impact from disturbance than Alternative 1, but more than Alternatives 2 and 4. This Alternative would have the greatest impact from new construction and maintenance.	This Alternative would have the least impact from disturbance than Alternative 1 and would have the least impact from new construction and maintenance.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.
Peavine	Northern Spotted Owl	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be 9.4 miles of OHV routes in suitable spotted owl habitat.	There would be 18.7 miles of OHV routes in suitable spotted owl habitat.	There would be no OHV routes in suitable spotted owl habitat.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most disturbance from miles of routes.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Sensitive, Rare and Uncommon Species	There is some potential mollusk and Oregon Slender salamander habitat in the Peavine system. There is not much impact to these species on the existing trails. No impacts would occur to Red-tree voles from OHV use.	Surveys in areas of new construction did not detect any sensitive, rare, or uncommon species. There would be fewer impacts in this location than Alternative 1 because the OHV routes would be confined to a smaller number of trails.	There would be six miles more new construction in this Alternative and may have more potential to affect sensitive, rare, or uncommon species habitat.	This alternative protects habitat from OHV use in this location. Although the impacts from other Alternatives would have minor effects on this group of species this Alternative is best for minimizing impacts.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most amount of new construction.
	Management Indicator Species	Alternative 1 creates impacts to MIS species across the Forest at all times of the year. The impacts are mostly in the form of harassment or disturbance.	Alternative 2 has three miles of new construction that could impact snag resources to a small extent. It would reduce impacts to deer, elk, and wild turkeys by eliminating harassment during 75-80 percent of the fawning period and all of the elk calving period as well as turkey nesting season. There would be 34.5 miles of OHV routes in winter range and 41 miles in summer range.	Alternative 3 has six miles more new construction than Alternative 2, so there would be more potential snags lost by this Alternative. The seasonal restriction has the same impact as Alternative 2 for deer, elk and turkeys. There would be 1.8 miles of OHV routes in winter range and 48.8 miles in summer range.	Alternative 4 would protect habitat for woodpeckers, martens, and removes the impacts of OHVs during the calving, fawning, and turkey nesting season. There would be no OHV routes in winter and summer range.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.
	Protection Buffer Species	There are insignificant effects to this group of species from OHVs. Snags are rarely affected in this Alternative.	The three miles of new construction may have minor effects on snags for these eastside species.	There are three times the potential for snag removal from this Alternative that could have minor effects for this group of snag using species.	There would be no effects to this group of species from this Alternative.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least amount of potential hazard tree (snags) removal.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Land Birds	Alternative 1 has some effect on land birds. OHVs cause nest disturbance and nest abandonment in some situations.	Alternative 2 would reduce the amount of OHV routes from Alternative 1, so there would be a reduction in nest abandonment due to the smaller area of impact. New construction however may cause some nesting losses during the construction year.	Alternative 3 would increase the amount of potential nest abandonment by increasing the miles of trail by 12 miles and increasing new construction disruption of nesting by an additional 6 miles of routes.	Alternative 4 would eliminate land bird losses from nest abandonment from OHV use.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.
	LSR	Alternative one would have potential OHV use throughout the system of LSRs. This could disturb and affect late successional species through disruption and traffic.	This Alternative would have no OHV trails in LSR. There would be about 0.52 miles of OHV trails in LSR-100s.	Alternative 3 would have 1.75 miles of OHV trails in LSR and 2 miles in LSR-100s.	Alternative 4 would have no miles of OHV trails in LSR and LSR-100s.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternatives 4 and 2 2. Alternative 3 3. Alternative 1 This ranking is based on the least amount of routes in LSR and LSR-100s to the greatest.
LaDee Flats	Northern Spotted Owl	Entire area is open to OHVs. This area is primarily dispersal habitat for spotted owls. OHVs currently use this area illegally and extensively. There is no major effect to spotted owls in this or any alternative due to no nesting owls in the areas of use.	There would be 5.7 miles of OHV trails in suitable spotted owl habitat. Only minor impacts to dispersing spotted owls would occur from this alternative.	There would be 7.4 miles of OHV trails in suitable spotted owl habitat. Only minor impacts to dispersing spotted owls would occur from this alternative.	There would be 0.5 miles of OHV trails in suitable spotted owl habitat. Only minor impacts to dispersing spotted owls would occur from this alternative.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most disturbance from miles of routes and road decommissioning.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Sensitive, Rare and Uncommon Species	No habitat for sensitive, rare, or uncommon species is in this area. Surveys did not find any species or suitable habitat.	No habitat for sensitive, rare, or uncommon species is in this area. Surveys did not find any species or suitable habitat.	No habitat for sensitive, rare, or uncommon species is in this area. Surveys did not find any species or suitable habitat.	No habitat for sensitive, rare, or uncommon species is in this area. Surveys did not find any species or suitable habitat.	No impacts.
	Management Indicator Species	Marginal habitat for all MIS species. Current illegal use may cause some disturbance to deer and elk. Illegal use is actually high in this area.	There would be fewer disturbances to deer and elk from OHV use than Alternatives 1 and 4. There would be 38.9 miles of OHV routes in winter range and 17.1 miles in summer range.	Alternative 3 would have the highest amount of disturbance to deer and elk in this marginal habitat. There would be 30 miles of OHV routes in winter range and 16.9 miles in summer range.	Alternative 4 would have the least disturbance to deer and elk in this marginal habitat. There would be 30 miles of OHV routes in winter range and 0.3 miles in summer range.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.
	Protection Buffer Species	No protection buffer species in this location.	No protection buffer species in this location.	No protection buffer species in this location.	No protection buffer species in this location.	No impacts.
	Land Birds	Alternative 1 current use (illegal) causes disruption of nesting and nesting loss in the areas used by OHVs.	Alternative 2 would authorize use in this location, so the loss of nesting would increase over the 39 miles of trails.	Alternative 3 would authorize use in this location, so the loss of nesting would increase over the 42 miles of trails. There would be three more miles where disturbance could occur.	Alternative 4 would authorize use in this location, so the loss of nesting would increase over the 25 miles of trails. There would be 14 miles less where disturbance could occur than the Alternative 2.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	LSR	Alternative one would have potential OHV use throughout the system of LSRs. This could disturb and affect late successional species through disruption and traffic.	Alternative 2 would have 14.2 miles of OHV trails in LSR and no miles in LSR-100s.	Alternative 3 would have 14.4 miles of OHV trails in LSR and no miles in LSR-100s.	Alternative 4 would have 0.2 miles of trails in LSR and no miles in LSR-100s.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least amount of routes in LSR and LSR-100s to the greatest.
Bear Creek	Northern Spotted Owl	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be 6.4 miles of OHV routes in suitable spotted owl habitat.	There would be 6.4 miles of OHV routes in suitable spotted owl habitat.	There would be no miles of OHV routes in suitable spotted owl habitat.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most disturbance from miles of routes.
	Sensitive, Rare and Uncommon Species	Alternative 1 has some potential to impact wolverine, Larch Mountain Salamander, and mollusk because of unrestricted OHV use both spatially and temporally.	Impacts from Alternative 2 would be reduced by seasonal restrictions and moving trails to avoid habitat impacts. No target species would be affected by new construction as observed during surveys.	Impacts from Alternative 3 would be reduced by seasonal restrictions and moving trails to avoid habitat impacts. No target species would be affected by new construction as observed during surveys. Less construction impacts than Alt 2.	The least impact from OHV due to elimination of routes at this site.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most amount of new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Management Indicator Species	Alternative 1 has some potential to impact deer, and elk because of unrestricted OHV use both spatially and temporally. The area is used as deer and elk summer range and production area.	Impacts from Alt 2 would be reduced by seasonal restrictions. The new construction would increase impacts to this area from harassment and lower production. It may also increase the vehicle/animal collisions from current condition in this area. There would be no miles of OHV routes in winter range and 39 miles in summer range.	Impacts from Alternative 3 would be reduced by seasonal restrictions. The new construction would increase impacts to this area from harassment and lower production. It may also increase the vehicle/animal collisions from current condition in this area. There would be no miles of OHV routes in winter range and 40 miles in summer range.	Alternative 4 would eliminate impacts to MIS species. There would be no OHV routes in winter and summer range.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.
	Protection Buffer Species	This area is outside the normal range for protection buffer species.	This area is outside the normal range for protection buffer species.	This area is outside the normal range for protection buffer species.	This area is outside the normal range for protection buffer species.	No impacts.
	Land Birds	The unrestricted season for OHV use in this Alternative creates impacts to nesting land birds. It may be a minor effect because use in this area appears lower than other areas, based on visual evidence.	The seasonal restriction for OHV use would reduce nest abandonment be moving use outside of much of the breeding season and allowing nest to be well established where adults are less likely to abandon the nest. More construction than Alt 3 means that there is a slight increase in construction nest losses but a lower amount of overall trails would reduce the long term effects by one mile.	The seasonal restriction for OHV use would reduce nest abandonment be moving use outside of much of the breeding season and allowing nest to be well established where adults are less likely to abandon the nest. Less construction than Alt 2 means that there is a slight decrease in construction nest losses but a higher amount of overall trails would increase the long term effects by one mile.	Alternative 4 would eliminate impacts to land birds.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.
	LSR	Alternative one would have potential OHV use throughout the system of LSRs. This could disturb and affect late successional species through disruption and traffic.	There would be no OHV routes in LSR and 0.58 miles in LSR-100s.	There would be no OHV routes in LSR and 0.58 miles in LSR-100s.	There would be no OHV routes in LSR and LSR-100s.	No impacts.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
Gibson Prairie	Northern Spotted Owl	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be 3.4 miles of OHV routes in suitable spotted owl habitat.	There would be 0.7 miles of OHV routes in suitable spotted owl habitat.	There would be no miles of OHV routes in suitable spotted owl habitat.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 3 3. Alternative 2 4. Alternative 1 This ranking is based on the least to most disturbance from miles of routes and road decommissioning.
	Sensitive, Rare and Uncommon Species	Alternative 1 allows unrestricted use of OHVs in this area both spatially and temporally. No target species were found during surveys in this area but OHVs may travel outside of currently used trails in this Alternative so some minor impacts could occur.	No target species were located during surveys in areas of new construction. No impacts to this group of species is expected from this alternative.	No target species were located during surveys in areas of new construction. No impacts to this group of species is expected from this alternative.	No impacts to this group of species is expected from this alternative.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 3 3. Alternative 2 4. Alternative 1 No impacts expected but a rare incident could occur. This ranking is based on the least to most amount of new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Management Indicator Species	No anticipated impacts to pileated woodpeckers or marten. Ongoing impacts to deer, elk, and turkey in this area of known production area especially for deer. Some breeding impacts due to no restrictions spatially or temporally.	Alternative 2 would reduce impacts to deer, elk, and turkey by limiting routes to 15 miles and restricting use during 75-80 percent of the fawning season for deer and 100 percent for elk and turkey. There would be 9 miles of OHV routes in winter range and 15 miles in summer range.	Alternative 3 would reduce impacts to deer, elk, and turkey by limiting routes to 5 miles and restricting use during 75-80 percent of the fawning season for deer and 100 percent for elk and turkey. There would be 1 mile of OHV routes in winter range and 5 miles in summer range.	Alterative 4 would eliminate OHV harassment to deer and elk. There would be no OHV routes in summer and winter range.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 3 3. Alternative 2 4. Alternative 1 This ranking is based on the least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.
	Protection Buffer Species	Some protection buffer species occur in this area but are not affected by OHV use.	Some protection buffer species occur in this location but are not affected by OHV use. New construction may reduce snags used by protection buffer species. Four miles of potential impact for Alt 2.	Some protection buffer species occur in this location but are not affected by OHV use. New construction may reduce snags used by protection buffer species. One mile of potential impact for Alt 3.	No impacts.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 3 3. Alternative 2 4. Alternative 1 This ranking is based on the least amount of potential hazard tree (snags) removal.
	Land Birds	OHV use is unrestricted spatially and temporally so there would be some nest abandonment from disruption.	Alternative 2 restricts OHV use to 15 miles of trails and restricts the timing of use to allow for many birds to fledge. The four miles of new construction could impact some nesting birds.	Alternative 3 restricts OHV use to 5 miles of trails and restricts the timing of use to allow for many birds to fledge. The <1 miles of new construction could impact some nesting birds.	No impacts.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 3 3. Alternative 2 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	LSR	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be no OHV routes in LSR and LSR-100s.	There would be no OHV routes in LSR and LSR-100s.	There would be no OHV routes in LSR and LSR-100s.	No impacts.
McCubbins Gulch	Northern Spotted Owl	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be 8.7 miles of OHV routes in suitable spotted owl habitat. There would be one known site within disruption distance.	There would be 10 miles of OHV routes in suitable spotted owl habitat. There would be one known site within disruption distance.	There would be 6.6 miles of OHV routes in suitable spotted owl habitat. There would be one known site within disruption distance.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most disturbance from miles of routes and road decommissioning.
	Sensitive, Rare and Uncommon Species	This relatively flat area lends itself to OHV use that is unrestricted in this alternative. There are some impacts to low mobility target species from off trail travel, although minor.	Alternative 2 restricts the OHV use to 51 miles of routes and 5 miles of new construction. However, most new construction has existing use. No target species were found during surveys.	Alternative 3 restricts the OHV use to 60 miles of routes and 14 miles of new construction. However, most new construction has existing use. The impact although minor is greater than Alt 2 and Alt 4.	Alternative 4 restricts the OHV use to 34 miles of routes and 1 mile of new construction. However, new construction has existing use. The impacts although minor are less than Alt 2 and Alt 3.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most amount of new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Management Indicator Species	This area has a fair amount of deer, elk, and turkeys and a high amount of current OHV use that impacts wildlife utilization of that due to the unrestricted area of OHV use. Most wildlife use is summer range with a small amount of winter range.	Alternative 2 would reduce the area of use to 51 miles of trail. The concentrated use would put higher pressure on a smaller area but would reduce current harassment in the areas without proposed trails. There would be 31 miles of OHV routes in winter range and 50 miles in summer range.	Alt 3 would reduce the area of use to 60 miles of trail. The concentrated use would put higher pressure on a smaller area but would reduce current harassment in the areas without proposed trails. This Alt has 9 miles more harassment issues than Alt 2. There would be 28 miles of OHV routes in winter range and 56 miles in summer range.	Alternative 4 would reduce the area of use to 34 miles of trail. The concentrated use would put higher pressure on a smaller area but would reduce current harassment in the areas without proposed trails. This Alternative has 17 miles less harassment issues than Alternative 2. This is the least impact to this group of all of the Alternatives. There would be 15 miles of OHV routes in winter range and 33 miles in summer range.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.
	Protection Buffer Species	This area has potential habitat for all of our protection buffer species. There is very little impact to this group of species from OHV use by itself. The occasional loss of snags for safety is the only impact to this group.	The 5 miles of new construction may remove some snags but a lot of the new construction areas are in areas of current user created trails and so no trees would actually be removed.	The 14 miles of new construction may remove some snags but a lot of the new construction areas are in areas of current user created trails and so no trees would actually be removed.	The 1 mile of new construction may remove some snags but a lot of the new construction areas are in areas of current user created trails and so no trees would actually be removed.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least amount of potential hazard tree (snags) removal.
	Land Birds	The unrestricted use of OHVs in this area creates nest disruptions occasionally from OHVs flushing ground nesting birds as they pass by the nest.	Alternative 2 would restrict the OHV nest disruption to 51 miles of trails.	Alterative 3 would restricts\ the OHV nest disruption to 60 miles of trails.	Alternative 4 would restrict the OHV nest disruption to 34 miles of trails.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	LSR	Alternative one would have potential OHV use throughout the system of LSRs. This could disturb and affect late successional species through disruption and traffic.	There would be 7.8 miles of OHV routes in LSR and 2.1 miles in LSR-100s.	There would be 7.9 miles of OHV routes in LSR and 1.1 miles in LSR-100s.	There would be 6.4 miles of OHV routes in LSR and one mile in LSR-100s.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 3 3. Alternative 2 4. Alternative 1 This ranking is based on the least amount of routes in LSR and LSR-100s to the greatest.
Rock Creek	Northern Spotted Owl	Entire area is open to OHVs. This provides more opportunity for close contact with nesting spotted owls and may cause disruption.	There would be 10 miles of OHV routes in suitable spotted owl habitat. There would be two known sites within disruption distance.	There would be 25.6 miles of OHV routes in suitable spotted owl habitat. There would be one known site within disruption distance.	There would be 13.9 miles of OHV routes in suitable spotted owl habitat. There would be one known site within disruption distance.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 2 2. Alternative 4 3. Alternative 3 4. Alternative 1 This ranking is based on the least to most disturbance from miles of routes, road decommissioning, and nest disruption distances.
	Sensitive, Rare and Uncommon Species	Slight potential impacts to rare mollusk and Oregon Slender Salamander from unrestricted cross-country OHV travel. Minor impacts to individuals.	Alternative 2 would reduce impacts to this group to 6 miles of new construction most of which is actually existing user created trails. It would reduce off trail use that can happen in Alt 1.	Alternative 3 would reduce impacts to this group to 7 miles of new construction most of which is actually existing user created trails. It would reduce off trail use that can happen in Alt 1.	Alternative 4 would reduce impacts to this group to 3 miles of new construction most of which is actually existing user created trails. It would reduce off trail use that can happen in Alt 1.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on least to most amount of new construction.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Management Indicator Species	This area is Deer and Elk winter Range. The unrestricted use of the area can impacts deer, elk, and turkey during critical times. Harassment during the winter can lower survival and reproduction.	Alternative 2 would reduce impacts to MIS species by reducing OHV use to 40 miles of trails and restricting the season of use to outside of the critical wintering period. There would be 36 miles of OHV routes in winter range and 30 miles in summer range.	Alternative 3 would reduce impacts to MIS species by reducing OHV use to 60 miles of trails and restricting the season of use to outside of the critical wintering period. There would be 21 miles of OHV routes in winter range and 50 miles in summer range.	Alternative 4 would reduce impacts to MIS species by reducing OHV use to 37 miles of trails and restricting the season of use to outside of the critical wintering period. There would be 1.3 miles of OHV routes in winter range and 39 miles in summer range.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 2 2. Alternative 4 3. Alternative 3 4. Alternative 1 The seasonal restriction reduces the importance of harassment in winter range. This ranking is based on least to most wildlife harassment (less miles of routes) and reduction in snags from danger tree removal need.
	Protection Buffer Species	This area has potential habitat for all of our protection buffer species. There is very little impact to this group of species from OHV use by itself. The occasional loss of snags for safety is the only impact to this group.	The 6 miles of new construction may remove some snags but a lot of the new construction areas are in areas of current user created trails and so no trees would actually be removed.	The 7 miles of new construction may remove some snags but a lot of the new construction areas are in areas of current user created trails and so no trees would actually be removed.	The 3 miles of new construction may remove some snags but a lot of the new construction areas are in areas of current user created trails and so no trees would actually be removed.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least amount of potential hazard tree (snags) removal.

OHV System	Species or Species Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Summary of Impacts from Alternatives
	Land Birds	The unrestricted use of OHVs in this area creates nest disruptions occasionally from OHVs flushing ground nesting birds as they pass by the nest.	Alternative 2 would restrict the OHV nest disruption to 40 miles of trails.	Alternative 3 would restrict the OHV nest disruption to 61 miles of trails.	Alternative 4 would restrict the OHV nest disruption to 37 miles of trails.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the amount of nest disruption (miles of routes) and new construction.
	LSR	Alternative one would have potential OHV use throughout the system of LSRs. This could disturb and affect late successional species through disruption and traffic.	There would be no OHV routes in LSR and 1.7 miles in LSR-100s.	There would be 0.8 miles of OHV routes in LSR and 1.4 miles in LSR-100s.	There would be no OHV routes in LSR and 0.7 miles in LSR-100s.	The following list depicts the impacts to this resource from the least impact to the greatest impact: 1. Alternative 4 2. Alternative 2 3. Alternative 3 4. Alternative 1 This ranking is based on the least amount of routes in LSR and LSR-100s to the greatest.

Snags and Down Wood

The implementation of this project would have little impact on snags or down wood. There are both existing trails and some new trail construction. Because the trails are narrow, the impact of the OHV trail construction is narrow and would not impact many snags. In some cases a snag may be removed, but the resulting down log would remain on site. Down logs still provide foraging habitat for many woodpeckers and provide habitat for salamanders, mollusk, small mammals, including bats. Snags around staging areas would periodically be removed for public safety as would some located along OHV trails during maintenance. However, this overall effect is below the level that DecAid analysis would be useful and in this situation snags could not be retained in areas of high traffic where public safety would be a concern.

Because there has been a reduction in harvest over the past 16 years, since the Northwest Forest Plan was implemented, the amount of snags being recruited on the landscape has been increasing. Jeff Reis, Area Forest Inventory Specialist, (via personal communication) indicated that according to Current Vegetation Survey (CVS) data, snag recruitment was on the rise.

DecAid Analysis

The loss of snags from designating OVH systems would be minimal and below the level that can be evaluated using the DecAid analysis tool. *The use of DecAid for the analysis of this action is not appropriate and is outside of the intended scope of DecAid.* Snags would only be removed if they pose a threat to human life (e.g., if a snag could fall on a rider while on a road, trail, or in the staging area). These trees cannot be retained without putting someone at risk. When hazard trees are removed, they are left on site and used for down wood habitat.

Direct and Indirect Effects for Snags and Downed Wood

The following actions have the potential to affect snags and down logs. Since snags may be hazardous, some of them may be felled adjacent to trails and staging areas. Project design criteria would leave hazard trees that are felled on site as down wood.

Alternative 1 – No Action

There would be no new trail construction so there would be no need to remove snags from trails unless there was an immediate threat to the OHV public. Periodically trail maintenance would remove trees that were hazardous to the public. This would be a very low number of trees per year. It is expected that recruitment would keep up or surpass removal.

Alternative 2 – Proposed Action

A few snags would be felled in areas of new construction, especially in the Bear Creek proposed OHV system. However, the trees that are felled would remain on the ground and provide habitat. Hazard trees would be removed if they appear that they would fall into the trail or around a staging area during maintenance. This alternative would have the greatest impact to snag resources because there are more miles of proposed new construction. The impacts to snags would be greater than Alternative 1 because of the new construction. No effect to snags expected for road decommissioning.

Alternative 3

This alternative may have the second highest potential for snag loss due to more roads and trails that would require maintenance and possible hazard tree removal. The assumption is that because these routes are now dedicated to OHV travel that more maintenance would be required than in Alternative 1 where routes are not designated and therefore maintenance is not planned for this activity. No effect to snags expected for road decommissioning.

Alternative 4

This alternative has the lowest potential for snag loss due to the least amount of roads and trails that would require maintenance and possible hazard tree removal. No effect to snags expected for road decommissioning.

Cumulative Effects for Snag and Downed Wood

Snags and down wood are affected by many Forest projects. Timber sales, thinning, road and campground maintenance, salvage, and power line safety, all contribute to snag loss. Fire wood cutting, campground and road maintenance, and timber sales can all reduce down wood. The current known projects are listed in Table 3-95. There are many past projects that have already reduced snag and down wood levels. Current Land and Resource Management Plans have made efforts to maintain a minimum amount of snags and down wood. The use of DecAid as a tool for planning has increased the amount of snags and down wood that is being maintained in vegetation management planning. The reduced rate of harvest on the Forest has increased the snag and down wood recruitment from fires, insects, and disease. Currently, snag levels are increasing more rapidly than snags or down wood is being removed from vegetation management activities (Jeff Reis, personal communication).

Management Indicator Species

Management Indicator Species (MIS) are species that are listed in the Mt. Hood Land and Resource Management Plan in order to simplify management for a guild of species that have similar needs or requirements. The conservation strategy at the time of the Forest Plan was to select wildlife species that could be monitored and managed that would indicate the health of the habitat that is shared by other wildlife in this particular group. For example, the pileated woodpecker is the largest woodpecker on the Forest and has the most need for large diameter snags; therefore, the pileated woodpecker was selected to indicate the health of snag dependant species, such as other cavity nesters. Other MIS are deer and elk for early successional habitat and marten for Mustelids. Gray squirrels represent the needs of oak dependant species and turkeys are included as MIS because of their economic importance as a hunted species.

Deer and Elk Habitat (Management Indicator Species)

The Forest Plan defines winter range as areas where at least 80 percent of the deer and elk are found at least 80 percent of the time during the winter months. These areas are generally below 2,800 feet on the westside and 3,000 feet on the eastside. Human activity should be reduced between December 1 to April 1 to reduce human interaction with wintering deer and elk.

The Forest Plan sets road density standards as follows: "Within the roaded portions of the Forest, by year 2000, roads open to motorized vehicle traffic should be reduced to 2.0 miles per square mile within the inventoried deer and elk winter range and 2.5 miles per square mile within inventoried deer and elk summer range. Open road densities for wintering and summer range areas should not exceed 1.5 miles per square mile during the critical periods for these areas."

Elk Habitat Relationships: Elk herds on the Forest exhibit a close association with riparian habitat in areas of gentle terrain and low road density. A study within the Clackamas River Ranger District from 1987 to 1992 recorded location and habitat type being utilized by radio-collared elk (Fiedler 1994). Seventy percent of all observations of these elk occurred within 100 meters of a stream or wetland. Shrub/seedling stage clear cuts received more than twice as much use than they were proportionally available to elk as a habitat type. Also, elk were observed to browse on a wide range of native shrubs, trees, forbs and grasses as well as utilizing non-native grasses (Fiedler 1994).

High road densities lead to harassment of elk herds. Harassed elk move more often than elk left alone and use of habitat decreases as road density increases (Witmer, G. W. and D.S. deCalesta. 1985). The study mentioned above also reported that elk within or moving through areas of high open-road densities moved longer distances; several miles per day was not uncommon.

Pedersen stated that, "Elk use out to 804.6 m declined 154 percent for main roads, 108 percent for secondary roads, and 33 percent for primitive roads (Pedersen, R.J. 1981 file copy).

Naylor et al. discuss the different behavioral responses of North American elk to All Terrain Vehicles (ATVs), hiking, mountain biking, and horse back riding (2009). The following excerpts from the publication demonstrate the difference in behavioral responses to OHVs and other forms of recreation. They also discuss the possible physical affects of those responses although the physical affects were not a part of the study. This publication also suggests that there may be some acclimation to continued use by these vehicles in an area. For example, Naylor et al. state:

"The highest travel response by elk was during ATV exposure and was followed by increased resting time. This type of recreational activity may have forced elk to forgo foraging in favor of hiding until the disturbance ended. In contrast to this any disturbance during the mountain biking and hiking treatments resulted in feeding activity increasing. It is possible that, being quieter than the ATVs, mountain biking and hiking did not disturb elk once they moved away from the routes; elk were, therefore, able to make up any energy lost by resuming foraging activity."

> *"Hypothesis 4, which postulated that continued exposure to disturbance leads to conditioning of elk to the disturbance and results in unaltered or reduced behavioral responses (i.e., habituation), was partially supported by our findings. A complicating factor in our evaluation of potential habituation of elk to recreation treatments is that we did not simultaneously evaluate changes in elk distributions. However, as part of the radiotelemetry monitoring of the same elk we studied, Preisler et al. (2006) found that elk moved away from travel routes during ATV riding with repeated ATV treatments. These movements allowed elk to resume activities similar to those of controls, while avoiding recreation routes. Such avoidance would not be considered habituation, but rather a different type of negative response to recreation."*

Winter range and forage in winter range are the limiting factors for elk on the Forest. Calving and fawning areas are also important, but on a lower scale than winter range. In general, winter range includes areas that are typically below 2,500 feet on the Forest. Calving and fawning areas are higher elevations that have gentle slopes and flat areas. Harassment in either of these areas is detrimental to healthy deer and elk populations. Harassment causes animals to move at times when energy expenditure is detrimental to survival or healthy reproductive process. Disturbances during the winter, birthing, or early rearing can lead to poor survival and reduce populations.

Existing Situation: Rock Creek, McCubbins Gulch, and the LaDee Flats proposed OHV systems all have some portion of the roads and trails in winter range. LaDee Flats has never been identified as an area that was important for winter range, although it is in the correct elevation and topography. Peavine, Bear Creek, and the Gibson Prairie proposed OHV route systems are identified as having important summer range and calving areas. Telemetry data for both Peavine and Gibson Prairie have documented the use of these areas by deer and elk for fawning and calving. Unpublished research by Oregon Department of Fish and Wildlife (ODFW) at Starky Wildlife Research Area in eastern Oregon indicated that 90% of elk give birth prior to June 16. This data was used in developing seasonal restrictions for deer and elk.

Telemetry studies have been conducted by ODFW in cooperation with the Mt. Hood National Forest to determine the summer range and fawning areas for deer. These studies indicate that deer spend their winter in the valley to the northeast of Gibson Prairie and return to the Gibson Prairie area in the spring, annually. One concern for this travel pattern is plans by Hood River County to increase OHV use in the transition area between Gibson Prairie and the winter range.

The elk herds that reside in the summer in the vicinity of the Peavine and Graham Pass proposed OHV route systems usually winter in areas off of the Mt. Hood National Forest. The elk closer to the southern part of the project area likely move further south in the Willamette National Forest, while those near the eastern part of the project area move into the Warm Springs Indian Reservation. Historically, studies along the Cascade Crest (Calvin et al. 1991) show that adult and calf elk mortality outside the hunting season is relatively high in the Sisi/Lemiti/Olallie area. The cause of mortality is unknown.

Some of the largest elk herds in the watershed are located in the Lemiti and northeast Sisi areas, although these areas seem to have a shortage of optimal and thermal cover. One reason for this is that these areas are still relatively isolated and still roaded more lightly than many other areas on the Clackamas River Ranger District. These areas may represent "security areas" for elk despite the low proportion of optimal and thermal cover. "Effective" thermal cover may be less critical to deer and elk in summering areas than in wintering areas, since deer tend to forage at night when temperatures tend to be much cooler.

Elk are known to congregate in the Lemiti and Hawk mountain areas during the fall.

In discussing deer and elk utilization with Clackamas Ranger District personnel, they have indicated that there is a low amount of utilization in the LaDee Flats area (Personal communication Hernandez, S. Malone, M. and Roden, J. 2008 and 2009). Indications are that deer and elk prefer to utilize the private lands to the north and west of the area due to more early seral habitat.

Deer have not been studied intensively within the Clackamas watershed, but are generally considered to be wider ranging, more tolerant of human disturbance, and less dependent on riparian areas.

Forage is widely available within the analysis area, but is generally of low quality. The low quality of the forage, especially in winter range, and the lack of wetlands and permanent low-gradient streams within winter range on the Clackamas River Ranger District are considered the limiting factors for elk and possibly deer within the project area.

Direct and Indirect Effects for Deer and Elk Habitat

A comprehensive summary of the effects of each alternative in relation to the areas where the roads and trails would be proposed for OHV use is detailed in Table 3-93. The effect to deer and elk from OHV trails and use is from disturbance or harassment. The areas with the greatest amount of roads and trails and/or no restriction on when trails can be used would have the most impact to these ungulates.

Seasonal closures would be in effect for routes in the following proposed OHV systems: Bear Creek, Gibson Prairie, McCubbins Gulch, Mt. Defiance and Peavine. Seasonal closures are in place at the times that are most critical for that area. By implementing seasonal closures, the impact to deer and elk from harassment is almost eliminated or reduced to the extent that it reduces any mortality or health and fitness issues.

The proposed decommissioning of roads would reduce the road density and improve utilization of deer and elk habitat due to the reduced harassment. If a large wildfire grew in size due to the reduced ability to control the wildfire there would be an increase in forage and a resulting expansion in the elk population.

Table 3-96. OHV roads, trails and area that would occur in summer and winter range by alternative.

OHV System	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Winter Range	Summer Range	Winter Range	Summer Range	Winter Range	Summer Range	Winter Range	Summer Range
Peavine1	n/a	n/a	34.47	41.04	1.8	48.76	0	0
LaDee Flats	n/a	n/a	38.86	17.09	30	16.86	29.96	0.30
Bear Creek1	n/a	n/a	0	39.09	0	39.63	0	0
Gibson Prairie1	n/a	n/a	8.96	15.06	0.95	4.85	0	0
McCubbins Gulch2	n/a	n/a	30.54	50.16	28.05	55.71	15.46	32.5
Rock Creek2	n/a	n/a	35.07	29.29	20.5	49.89	1.27	39.09
Graham Pass	n/a	n/a	0	0	0	63.91	0	0
Mt. Defiance 1	n/a	n/a	0	0	0	5.46	0	0
Winter or Summer Range (WR or SR)	WR	SR	WR	SR	WR	SR	WR	SR
Totals	**632.03**	**1864.44**	**150.9**	**191.73**	**81.3**	**285.07**	**46.69**	**71.59**

1 Seasonal restriction during both winter and summer periods
2 Seasonal restriction during winter only.

The Forest Plan standard for road density is 2.0 miles per square mile in winter range, and 2.5 miles per square mile in summer range. The small changes in the amount of roads and trails do not make a substantial difference in the density of the roads on the Forest by alternative. Table 3-97 shows the road densities by 6th field watershed for each alternative. If a portion of the OHV roads and trails fall between two watersheds, then the watershed with the greatest portion of the road or trail was used to estimate the road density.

Table 3-97. Road densities by alternative and proposed OHV system.

Proposed Route System (6th field Watershed)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Peavine (MiddleUpper Clackamas)	3.50	3.20	3.46	3.20
LaDee Flats (Lower Clackamas tribs)	2.27	2.25	2.33	2.31
Bear Creek (Upper Westfork Hood R)	1.70	1.90	1.89	1.69
Gibson Prarie (Mill Creek)	0.13	0.11	0.13	0.11
McCubbins (Clear-Frog Creek)	3.81	3.76	3.82	3.71
Rock Creek (Rock Creek)	2.50	2.55	2.44	2.38
Graham Pass (Middle Upper Clackamas)	3.50	3.20	3.46	3.20
Mt. Defiance (Lower Westfork Hood River)	1.00	0.93	1.00	0.93

Alternative 1 – No Action

The current situation allows unrestricted use of deer and elk habitat across the Forest, except for areas designated as being closed to off-highway use, with no seasonal restriction on use. GIS analysis indicates that there are 3282 miles of roads and trails that could be used by OHVs on the Forest. This allows for a great amount of disturbance of elk populations often at times when it is critical for deer or elk fitness, reproduction, or survival. This reduces the amount of forage available to them because they avoid the area where there is vehicle traffic.

Table 3-95 shows the breakdown for the amount of roads and trails that would occur in winter and summer range for the alternatives. There are no figures shown in Alternative 1 for the roads and trails by OHV system since the routes extend beyond the areas used for the action alternatives. There are 632 miles of OHV capable area in winter range, which is four times greater than Alternative 2. There are 1,864 miles of routes in winter range for Alternative 1, which is 6.5 times more roads than in Alternative 3.

Table 3-97 shows the road densities for each of the proposed route system by alternative. Bear Creek, Gibson Prairie, and Mt. Defiance proposed OHV roads and trails meet the Forest Plan standards for alternative 1. The other routes are currently above the plan standards.

Alternatives 2, 3 and 4

Table 3-95 shows the amount of routes located in winter and summer range for deer and elk. It also indicates if there is a seasonal closure for the critical periods for these ungulates to reduce disturbance during critical periods. Table 3-95 shows the analysis and ranks the alternatives based on the amount of routes in each habitat. Seasonal restrictions would reduce most of this impact.

Table 3-97 shows the road densities for each of the proposed route system by alternative. Bear Creek, Gibson Prairie, and Mt. Defiance proposed OHV roads and trails meet the Forest Plan standards under Alternatives 2, 3 and 4. All of the other proposed OHV roads and trails do not meet the Forest Plan standards and there is very little difference the density of the routes by alternative. There is not any great increase in density from the current situation and there are no substantial reductions in road densities by any of the proposed alternatives. Based on the road densities, the alternatives can be ranked from best to worst for impacts to deer and elk as follows: Alternative 4, Alternative 2, Alternative 1, and Alternative 3. The higher the road density, then the lower its rating is for deer, elk, and wildlife in general.

Cumulative Effects for Deer and Elk Habitat

Cumulative effects are summarized in Table 3-98. Roads, recreation trails, hunting, campgrounds, logging operations, recreation facilities such as ski areas, special use permits, mushroom picking, hunting, wilderness users, administrative use, energy corridors, and OHVs all have an impact on deer and elk use of habitat and the health of individual animals that are forced to move from forage and birthing areas at critical times. Good forage is limited on the Forest so human harassment is a factor in deer and elk productivity on this Forest.

Harassment that disrupts travel from winter range and birthing areas could influence individual animal health and herd health in general. One of the cumulative effects that could influence this pattern is plans by Hood River County to increase OHV use in the transition area between Gibson Prairie and the winter range.

American Marten & Pileated Woodpecker (Management Indicator Species)

The status and condition of management indicator species (MIS) are presumed to represent the status and condition of many other species. This EIS focuses on certain key species and does not specifically address common species except to the extent that they are represented by management indicator species.

The pileated woodpecker was chosen as an MIS because of its need for large snags, large amounts of down woody material, and large defective trees for nesting, roosting and foraging. The American marten is an indicator species to mature or older forests with dead and defective standing and down woody material. It has a feeding area that utilizes several stand conditions that range from poles to old growth (USDA 1990). Both pileated woodpeckers and American Marten are not as highly affected by human presence as some species. They can tolerate a high amount of human presence and are often found in areas with high human occupation. Both marten and pileated woodpeckers can often be found in recreation areas, ski area, near homes, and buildings. So disturbance factors are low impacts to these species. Maybe one of the greatest risks to marten is being run over by vehicles. Because of their tolerance of humans and even scavenging food left by people, they may be involved in more vehicle/animal collisions because of their proximity.

The pileated woodpecker is associated with forest habitats that have large trees, especially snags for nesting and foraging. It will use both coniferous and deciduous trees, but tends to be most common in old-growth Douglas-fir forests in western Oregon (Csuti 1997). Pileated woodpeckers are present in all of the areas proposed to have OHV trails and roads.

American martens are associated with forested habitats at higher elevation, but will wander through openings and even up into alpine areas. They prefer mature forests with closed canopies, but sometimes use openings in forests if there are sufficient downed logs to provide cover (Csuti 1997). Martens are affected to some degree from forest fragmentation and tend to remain in forested habitat and prefer to cross small openings. Martens are good climbers and most often utilize hollow trees for dens. Based on elevation and habitat it is expected that martens can be found in or around the trails at Bear Creek, Gibson Prairie, Peavine, Mt. Defiance, and Graham Pass. Although not impossible they would not be expected to be found as often at LaDee Flats, Rock Creek or McCubbins Gulch because of their lower elevation.

Direct and Indirect Effects for Pileated Woodpeckers and American Marten

Table 3-95 does not address the effects to pileated woodpeckers and marten in the MIS species summary. It is not possible to quantify the actual impacts in terms of reproductive loss or harm to an individual or a population, so the alternative is to compare the amount of exposure or risk to the species. Therefore, the analysis method is to compare the miles of roads and trails from one alternative to the others. Based on the amount of trails and new trail construction, which could impact snags or the amount of disturbance to martens, there is a general order of potential impacts that repeats for most alternatives. The order of impact from least to greatest for pileated woodpeckers and martens is Alternative 4, 2, 3, and 1.

Alternative 1 – No Action

This alternative allows disturbance across the Forest with no seasonal restrictions and could occur in a greater number of areas suitable for OHV use. There are 2,463 miles of roads and 49 miles of trails available for OHV use. It also increases the area where hazard trees may need to be removed to reduce hazards to riders and drivers. The ranking of alternatives in terms of potential impacts is based on new construction and the possibility of some loss of snags and parallels the ranking for American marten.

Alternative 2 – Proposed Action

The proposed action includes seasonal restrictions in several areas where American marten occur, but is in the middle of the alternatives in terms of the amount of trails and roads. There are 221 miles of roads and trails in this alternative. So the size of the impact would be lower than the current situation in Alternative 1, but the intensity of the impact would increase in this area.

No short-term effects to the pine marten or pileated woodpecker from road decommissioning would be predicted with this alternative. No direct effects from road decommissioning would occur to pine marten or pileated woodpecker population or their habitats.
Alternative 3

This alternative includes seasonal restrictions in several areas where American marten occur, but is on the high end of the action alternatives in terms of the amount of trails and roads. There are 326 miles of roads and trails in this alternative. So the size of the impact would be lower than the current situation in Alternative 1, but the intensity of the impact would increase in this area.

No short-term effects to the pine marten or pileated woodpecker from road decommissioning would be predicted with this alternative. No direct effects from road decommissioning would occur to pine marten or pileated woodpecker population or their habitats.

Alternative 4

This alternative includes seasonal restrictions in several areas where American marten occur, but is on the low end of the action alternatives in terms of the amount of trails and roads. There are 96 miles of roads and trails in this alternative. So the size of the impact would be lower than the current situation in Alternative 1, but the intensity of the impact would increase in this area.

No short-term effects to the pine marten or pileated woodpecker from road decommissioning would be predicted with this alternative. No direct effects from road decommissioning would occur to pine marten or pileated woodpecker population or their habitats.

Cumulative Effects for Pileated Woodpecker and American Marten

Cumulative effects are summarized in Table 3-98. The table indicates impacts to snags and down wood resources that would affect Pileated woodpeckers and American marten.

Direct and Indirect Effects for Gray squirrel and Wild Turkey

Gray squirrels and wild turkeys are primarily an eastside species where oak and open savanna is present. There is no proposal to remove any oak habitats that both gray squirrels and wild turkeys depend on for a food source. These two species are highly dependant on mast production from oaks and population levels for these species will fluctuate based on mast crop years to some degree.

Roads and trails open up avenues for hunters for these species. The greater the density of roads the more hunting pressure they will receive. By closing roads to OHV traffic this may reduce the ingress into some locations by hunters and may reduce both hunting opportunities and hunting success. This would have little overall effect on the populations; however, a large segment of the populations will be lost through natural mortality, such as predation, disease, starvation, and vehicle collisions. There could be some loss of nest success for turkeys if they choose to nest near a trail prior to the commencement of the off-road season where no seasonal closures are proposed.

Alternative 1 – No Action

Alternative 1 has the greatest impact on these species because it allows unrestricted access to OHVs across the habitat where these two Management Indicator Species occur. There would be more nest disruption, more hunting access, and more vehicle collisions.

Alternatives 2, 3 and 4

The effects of these alternatives are minor for these species. No oak habitat is removed by any alternative. The effects of these alternative are ranked on the miles of roads and trails open to OHVs that could create vehicle collisions, hunting pressure, and nest disruption. Seasonal closures for some areas limit the amount of nest disruption that would occur. The effects are summarized in Table 3-95. If there are no anticipated effects then there is no mention in the table.

Cumulative Effects for Gray Squirrel and Wild Turkey

There is no oak habitat removal planned that would affect gray squirrels or turkeys. Nest disruption and vehicle collisions can occur anywhere a road or trail exist. The effects would be minor when considered at a population level.

Avian Resources (Migratory birds or Land Birds)

There are approximately 175 species of birds that occur within the boundary of the Forest, some of which are likely present within the immediate proximity of the OHV roads and trails during the breeding season. Some species favor habitat with late-successional characteristics while others favor early-successional habitat with large trees. Some of the species that might nest in close proximity to roads and trails are as follows: Hermit/Townsend's warbler complex, hermit and varied thrush, Pacific-slope flycatcher, rufous hummingbird, olive-sided flycatcher, song sparrow, chipping sparrow, junco, blue and ruffed grouse, Mountain Quail, common poorwill, MacGillivray's Warbler, Nashville warbler, and Wilson's warbler.

Species of Regional Concern listed in the Partner's in Flight- Species Assessment Database that may occur in the vicinity of the OHV roads, trails and one small OHV area are as follows: Blue grouse, olive-sided flycatcher, willow flycatcher, ruffed grouse, Cooper's hawk, red-breasted sapsucker, dusky flycatcher, Cassin's vireo, golden crowned kinglet, Bullock's oriole, purple finch, and red crossbill. The entire assessment may be found at: http://www.rmbo.org/pif/scores/scores.html.

Direct and Indirect Effects for Avian Resources

The species from the Partner's in Flight- Species Assessment Database that may be affected by the use of the proposed OHV systems are: Blue grouse, ruffed grouse, and Cooper's hawk. These birds could be disturbed by passing vehicles when they nest in the vicinity of an OHV road or trail. The grouse are ground nesting birds and may experience nest disruption if they are nesting near an OHV road or trail. These birds are often hit in the road by vehicles. Cooper's hawks are sensitive to human presence and may abandon nest when people are present. Red-breasted sapsuckers may be affected by the removal of trees that are a danger to riders.

See Table 3-95 see a comparison summary of effects. Effects are directly related to the amount of roads and trails that would be open to OHV use and therefore would potentially allow for nest disruption and possible failure. The effects can be offset by seasonal closures to OHV use. Seasonal restrictions that benefit nesting birds would be in effect for Peavine, Bear Creek, and Gibson Prairie roads and trails.

Decommissioning of roads would not alter the habitat for migratory birds. There would be no negative effects to species that prefer late-seral habitats. There may be a reduction in areas for birds to gather grit from the road surface but this is minor. The effect would mostly be to grouse, quail, doves and pigeons, but there are many places for these species to find grit so it is not a limiting factor.

Increased risk from large fires by reducing road densities would have a short-term, negative effect on the production of some species in the year of the fire. However, in the long term some species that require early-seral habitats would increase, while late-seral species would decline. Some species would benefit from the increase in snag numbers from the fire.

Decommissioning of roads would allow for this habitat to eventually fill in the gap and decrease the edge effect. This may decrease species richness and foraging opportunity for some species but it would reduce nest parasitism and predation that comes with the edge effect.

Alternative 1 – No Action

This alternative has the greatest potential to impact nesting birds because there are very few restrictions on where OHVs can travel, or on the time of year that this would affect nesting birds. The most severe impact would be nest abandonment and loss of reproduction due to heavy traffic following a relatively quiet period when a bird would have a chance to establish a nest and lay eggs and then be frightened from its nest while incubating eggs.

Alternative 2 – Proposed Action

This alternative has lower impacts to birds than Alternatives 1 and 3, but more impacts than Alternative 4. This is directly related to the amount of roads and trails available to OHV users which could cause nest disruption. The effects are reduced in some of the identified areas due to seasonal restrictions that would allow birds to complete nesting prior to allowing the vehicles into the area.

Alternative 3

This alternative has more impacts to birds than Alternative 2 and 4, but less than Alternative 1. The effects are related to the amount of roads and trails in the alternatives.

Alternative 4

This alternative has the least impacts to birds due to the lower amount of roads and trails in the alternative.

Cumulative Effects for All Species and All Focal Groups

There are many past, present and future projects that would have similar effects to OHV roads and trails on both snags and wildlife harassment. The identified projects are listed below in Table 3-98. Snags are a small part of the impact from maintaining roads and trails for OHVs. There is a small amount of loss from new construction, such as proposed for the Bear Creek trails or from routine maintenance removal of hazard trees near staging areas and along trails. However, the loss of snags is extremely low compared to vegetation management projects. The influx of new snags from insects and disease is currently off setting the loss of snags in the OHV locations.

The loss of snags from the OHVs roads and trails is minor but harassment from OHV use is substantial. The combination of the cumulative effects listed projects below and the OHV impacts would reduce the capacity of these areas to produce wildlife. It is not something that can be easily quantified in terms of the number of animals lost from nest abandonment, abandonment of young, loss of foraging opportunities, or avoidance of habitat due to harassment. Yet there is a considerable loss of wildlife individuals due to harassment. The cumulative effects table only demonstrates the easily foreseeable projects that would be additive to this loss and it does not quantify this loss. The impact from human presence and OHVs is a loss of utilization of habitat for either a short amount of time if the use is infrequent to a great loss in utilization of habitat if the human use is frequent. The effects to deer, elk, pileated woodpeckers, and American marten are the same as those discussed in Table 3-95 for disturbance and snags and down wood.

Prior to the designation of specific roads and trails for OHV use, the utilization of areas would be more dispersed so the impact to any given area would be less and the cumulative effects of disturbance would be reduced for that area. By designating in OHV routes the impacts would be more concentrated. Areas where OHVs are no longer legal would benefit from less harassment. Areas with concentrated OHV use would have less wildlife use as animals move away from human disturbance. This could result in animals moving as far as 250 m to 4 km from the disturbance (Pedersen 1981).

Table 3-98. Past, present and foreseeable future projects and actions.

Project Name	Extent, Size, Type, & Distance	Overlap In Time Or Space	Alteration of snag or down log	Effect	Meaningful Effect	Rationale For Inclusion Or Exclusion From Analysis Below
General						
Past-timber harvest	Throughout Analysis Area	Yes, after affects are still ongoing	yes	Snag removal	yes	Include. A loss of snags, mainly in the small to moderate size classes has occurred.
Road building	Throughout Analysis Area	Yes, after affects are still ongoing	yes	Harassment and Snag removal	yes	Include. Harassment from vehicles. Loss of snags.
Pre-commercial thinning	Throughout Analysis Area	Yes, ongoing and interspersed	yes	Harassment	yes	Include. Harassment from vehicles.
Special forest products	Throughout Analysis Area	Yes, ongoing and interspersed	no	Harassment	yes	Include. Harassment from people.
Ongoing incidental road maintenance	Throughout Analysis Area	Yes, ongoing and interspersed	no	Harassment	yes	Include. Harassment from vehicles.
Stream restoration projects	Throughout Analysis Area	Yes, ongoing and interspersed	no	Harassment	yes	Include. Harassment from people.
Future activities –All routes						
Hazard tree removal along roads	Throughout Analysis Area	Yes, ongoing and interspersed	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
Invasive plants EIS	Throughout Analysis Area	Yes, ongoing and interspersed	no	Harassment	yes	Include. Harassment from vehicles and people.
Aquatic Restoration	Throughout Analysis Area	Yes, ongoing and interspersed	no	Harassment	yes	Include. Harassment from vehicles and people.
Gibson Prairie OHV Routes						
Private land harvesting activities on SDS lands		Yes	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
City of The Dalles Logging in The Dalles Watershed	Various timbersales/fuels reduction that is adjacent to the G. Prairie OHV	Yes	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
Culvert replacement on N.Fork Mill Creek-1711630	Isolated locations, short time frame, small impact	No overlap in time	no	Harassment	yes	Include. Harassment from noise is very limited.
N. Fork Mill restoration project	Large footprint, similar impacts from trails, some impact to snags, overlapping	Yes	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.

Project Name	Extent, Size, Type, & Distance	Overlap In Time Or Space	Alteration of snag or down log	Effect	Meaningful Effect	Rationale For Inclusion Or Exclusion From Analysis Below
Hood River County OHV trails to North	Adjacent to proposed trails, harassment issues for migrating deer, directly related project type.	Yes, there are connected trails	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
Long Prairie Grazing Allotment	Dispersed impacts from cattle, soil and veg impacts, harassment from people, interspersed.	Yes, short duration impacts scattered across the area.	no	Harassment	yes	Include. Harassment from people.
The Dalles Watershed Fuelbreak	Medium impact, adjacent to proposed trails, harassment from logging, loss of snags	Yes	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
BPA maintenance, and herbicide treatment	Narrow corridor, harassment from workers, intersects trails, additional herbicide impacts if invasive treatment is necessary on trails.	Yes, ongoing and overlapping	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags. Additional herbicide impacts are possible.
Warming huts on Surveyor's Ridge	Small footprint, small amount of harassment, close proximity	Yes, there is a small footprint	no	Harassment	yes	Include. Harassment from people.
Surveyor's Ridge Trail grant proposal for reconstruction	Small footprint, similar impact, small amount of harassment, close proximity	Yes	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
Geothermal lease (BLM)	Undetermined locations, unknown size, harassment might occur.	Yes	no	Harassment	yes	Exclude. No site specificity. Can not be modeled at this time. The appropriate time to conduct a cumulative effects analysis would be in a future EA after a firm proposal is developed.
FS agreement for management of OHV trails in Bald Butte area.	Small area, same impacts as proposal, short distance.	Yes	no	Harassment	yes	Include. Harassment from noise.

Project Name	Extent, Size, Type, & Distance	Overlap In Time Or Space	Alteration of snag or down log	Effect	Meaningful Effect	Rationale For Inclusion Or Exclusion From Analysis Below
Bear Creek OHV Routes						
Geothermal lease (BLM)	Undetermined locations, unknown size, harassment might occur.	Yes, unknown	no	Harassment	yes	Exclude. No site specificity. Can not be modeled at this time. The appropriate time to conduct a cumulative effects analysis would be in a future EA after a firm proposal is developed.
Flood Control Berm at Red Hill Bridge	Very small, insignificant impact	Yes, very small footprint	no	Harassment	no	Exclude. To small to consider.
Red Hill Bridge Replacement	Very small, insignificant impact	Yes, very small footprint	no	Harassment	no	Exclude. To small to consider.
Road closures	No wildlife impacts	Yes, short limited time frames	no	None	no	Exclude. No impacts.
Yaka planning area	Medium impact, timber removal, harassment and snags, overlapping	Yes	yes	Harassment	yes	Include. Harassment from noise.
Rock Creek OHV Routes						
Sportsman's Park fuels reduction project	Medium size, reduction of snags and harassment from logging, overlapping	Yes	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
Maintenance Burning for Gobbler Underburn	Medium size, controlled fire, harassment and loss of snags, nearby	Yes, short time frame	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
Grasshopper Grazing Allotment	Dispersed impacts from cattle, soil and veg impacts, harassment from people, interspersed.	Yes, short spurts of people influence throughout area	no	Harassment	yes	Include. Harassment from people.
ANPO Ceremonies	Small ceremony, short time frame, minor harassment issues	Yes	no	Harassment	no	Exclude. Time frame is too short to consider meaningful.
McCubbins Gulch OHV Routes						
Palomar Pipeline	Extensive pipeline, adjacent to trails, similar imapacts, short duration	Yes, permanent but major impact is short term	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
White River Grazing Allotment	Dispersed impacts from cattle, soil and veg impacts, harassment from people, interspersed.	Yes, permanent but short-term impacts	no	Harassment	yes	Include. Harassment from people.

Project Name	Extent, Size, Type, & Distance	Overlap In Time Or Space	Alteration of snag or down log	Effect	Meaningful Effect	Rationale For Inclusion Or Exclusion From Analysis Below
Clear Creek Ditch Maintenance	Very small, insignificant impact, short duration	Yes, permanent maintenance	no	Harassment	yes	Exclude. Time frame is too short to consider meaningful.
Path Timber Sale	Large timbersale, reduction of snags and harassment from logging, overlapping	Yes, several years for completion	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
Road Closures	Very small, insignificant impact, short duration	Yes, small time frames	no	Harassment	yes	Exclude. Time frame is too short to consider meaningful.
Hilynx EA (HiThin)	Large timbersale, reduction of snags and harassment from logging, short distance	Yes, several years for completion	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
LaDee Flats OHV Routes						
No Whiskey Plantation Thinning	Large timbersale, reduction of snags and harassment from logging, adjacent and interspersed	Yes, several years for completion	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
Dry Stewardship OHV Restoration	Overlapping, throughout LaDee area, filling in water holes with rocks	Yes	yes	Harassment and water source loss	yes	Include. Harassment from noise. Loss of open water sources for bats, amphibians, and other wildlife.
Rethin Plantation thinning	Large timbersale, reduction of snags and harassment from logging, overlapping	Yes, several years for completion	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
Peavine OHV Routes						
Upper Clack Plantation Thinning	Large timbersale, reduction of snags and harassment from logging, within 2 miles.	Yes several years for completion	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
BPA power line maintenance	Narrow corridor, harassment from workers, intersects trails, additional herbicide impacts if invasive treatment is necessary on trails.	Yes permanent maintenance impacts	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
Cascade Crest Fuel Break	Medium fuels reduction, reduction of snags and harassment from logging, overlapping OHV area.	Yes permanent maintenance impacts	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.

Project Name	Extent, Size, Type, & Distance	Overlap In Time Or Space	Alteration of snag or down log	Effect	Meaningful Effect	Rationale For Inclusion Or Exclusion From Analysis Below
Palomar Gas Pipleline	Extensive pipeline, adjacent to trails, similar imapacts, short duration	Yes permanent but major impact is short term.	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
Summit Huckleberry Enhancement	Medium vegetation management, reduction of snags and harassment from logging, northeast corner of the Peavine trails, overlapping.	Yes periodically	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.
Tribal Activities	Medium footprint, short time frame, minor harassment issues, some snag loss, some vegetation management	Yes periodically	yes	Harassment and Snags	yes	Include. Harassment from noise. Loss of snags.

3.5.3. Incomplete and Unavailable Information

There is very little information on the true affects of disturbance or disruption on most species of wildlife. Each species is unique in the way they react to human presence, noise, and vehicles. There is some information on the effect to deer and elk based on scientific studies, but each study has shown that there is a wide variation in the reaction of both individual animals and populations because of hunting pressure or lack of hunting.

Species like spotted owls who have up until recent times been species of the deep forest where there has been little interaction with humans have never developed a reason to fear human presence. There as been a great deal of speculation in the wildlife science community over the question of whether spotted owls are affected by noise or human presence. Yet there has been very little scientific study to provide conclusive proof of nest disruption or lack of. What studies have been accomplished (on Mexican spotted owls) concluded that there were no reproductive failures.

It is not known how many trees or danger trees would be removed to provide new routes or for maintenance of routes.

3.6. Botany

This section discusses federally listed Proposed, Endangered, Threatened and Sensitive plants species (PETS species). This includes vascular and non-vascular plants, lichens fungi, and invasive plants. The sensitive plants are from the Forest Service Region 6 Sensitive Plant List (2007). This project does not propose to treat or monitor invasive plants. This analysis is based on the information found in the Botany Biological Evaluation and the Botany and Invasive Plant Report for this project, which is in the project record located at the Forest Headquarters Office in Sandy, Oregon.

3.6.1. Affected Environment

General Forest

Currently OHVs are permitted to operate off of roads and trails where not restricted. Most of the Forest is open to off-road travel with risk to some sensitive plant sites as a result. The majority of the Forest's lands is too steep and/or densely vegetated for off-road or trail OHV travel. Also, many of the sensitive plant sites are in Wilderness, Resource Natural Areas, or Bull Run Watershed, which prohibit OHV use. There are some areas on the Forest that have resource damage, such as the LaDee Flats area, Camas Prairie, and dry open areas on the Barlow Ranger District near the Rock Creek Reservoir.

The proposed LaDee Flats OHV system has some sensitive plants, but the resource damage is mostly on old roads and skid roads that are already disturbed and, therefore, do not affect sensitive plants. The other proposed OHV locations, while they contain interesting and fragile plants, do not have any sensitive plant sites. No documentation of damage to sensitive plants by OHVs has been found up to this time. The only sensitive plant site found that seems particularly vulnerable is just north of the proposed Gibson Prairie OHV system. This location is rather open and supports the sensitive plant *Lomatium martindellii*. However, a site visit in September 2008 found OHV tracks on existing trails, but no sign of damage to the plants.

The proposed Forest Plan amendments would vastly reduce the total area where OHVs are permitted to operate, restricting them to the proposed routes and prohibiting off route travel. This would eliminate almost all risk to sensitive plants and greatly reduce the spread of invasive species by legal OHV use across the entire Forest.

No fragile or sensitive plant communities would be affected by any of the action alternatives.

LaDee Flats Proposed OHV System

Due to its easy access, gentle terrain, and close proximity to Estacada and Portland this entire area is heavily used by OHVs. The forest in this proposed OHV location is around seventy years old and the plant association is Western Hemlock/Dwarf Oregon Grape/Swordfern. Surveys were conducted and found the following species:

- Trees: *Pseudotsuga menziessii, Tsuga heterophylla, Thuja plicata, Acer macrophyllum,* and *Alnus rubra*.
- Shrubs: *Berberis nervosa, Rubus ursinus, Acer circinatum, Gaultheria shalon, Vaccinium parviflora, Symphoricarpos alba,* and *Vaccinium ovalifolium*.
- Forbs: *Polystichum munitum, Lactuca muralis Pteridum aquifolium, Viola sempervirens, Linnea borealis, Galium aperine, Montia siberica, Frageria vesca,* and *Smilacina stellata.*

McCubbins Gulch Proposed OHV System

The McCubbins proposed OHV location is already established with numerous trails for motorcycles and three- and four-wheeled OHVs. The forest here falls in the Grand fir series. Several plant associations are represented here including Grand fir/Chinkapin, Grand fir/Oceanspray, Grand fir/Snowberry, and Grand fir/Twinflower. The following plant species were found here were:

- Trees*: Abies grandis, Tsuga heterophylla, Pseudotsuga menziessii, Pinus contorta* and *Pinus ponderosa.*
- Shrubs: *Acer circinatum, Rosa gymnocarpa, Rubus ursinus, Symphoricarpos albus, astanopsis chrysophylla, Berberis nervosa, Chimaphila umbellate, Ceanothus velutinus, Holodiscus discolor* and *Ribes sp.*
- Forbs: *Linnaea borealis, Hieracium albiflorum, Fragaria vesca, Achlys triphylla, Clintonia uniflora, Pteridium aquifolium, Fragaria virginiana, Epilobium angustifolium* and *Trientalis latifolia.*

Rock Creek Proposed OHV System

This location consists primarily of converting pre-existing Forest Service roads to OHV trails. The forest in this proposed OHV location is dominated by Grand fir, Douglas fir, Ponderosa pine and western Larch. The primary plant association is Grand fir/Snowberry. The following plant species exist in this location:

- Trees: *Abies grandis, Pinus ponderosa, Pseudotsuga menziessii, Larix occidentalis, Prunus emarginata* and *Populus trichocarpa*.
- Shrubs: *Rubus parviflorus, Holodiscus disclor, Castenopsis chrysophylla, Pachystima myrsinites, Berberis nervosa, Acer glabrum var. douglasii, Ceanothus velutinus, Chimophila umbellate, Symphoricarpos alba, Rosa gymnocarpa, Rubus ursinus,* and *Acer circinatum.*
- Forbs: *Pteridium aquilinum, Achlys triphylla, Trientalis latifolia, Hieraceum albiflorum, Fragaria vesca, Arenaria macrophylla* and *Anemone oregana. Bryoria, Nodobryoria* and *Letharia* are the dominant lichens.

Peavine Proposed OHV System

The majority of this proposed OHV location is Silver fir except for the land directly around Summit Lake where the thin soil supports primarily *Pinus contorta*. Silver fir/big huckleberry/beargrass is the primary plant association with lesser amounts of Mountain hemlock/grouse huckleberry in the higher elevations. The following plant species exist in this location:

- Trees: *Abies amabilis, Tsuga heterophylla, Tsuga mertensiana, Pseudotsuga menziessii, Larix occidentalis, Pinus contorta* and *Populus trichocarpa.*
- Shrubs: *Acer circinatum, Rhododendron macrophyllum, Vaccinium membranacea, Vaccinium scoparium, Castanopsis chrysophylla, Chimophila umbellate, Gaultheria ovalifolia, Berberis nervosa, Pachystima myrsinites, Vaccinium alaskaense, Rosa gymnocarpa, Chimophila menziessii* and *Rubus ursinus.*
- Forbs: *Xerophyllum tenax, Linnaea borealis, Viola sempervirons, Pteridium aquilinum, Pyrola secunda, Pyrola picta, Clintonia uniflora, Osmorhiza chilensis, Trillium ovatum, Goodyera oblongata,* and *Cornus canadensis.*

Gibson Prairie Proposed OHV System

Many Forest Service roads, OHV trails, horse trails, and "native roads" presently run throughout this proposed OHV location. OHV use is currently illegal, as the area is closed by Forest Order; however, there continues to be OHV use and illegal OHV trail construction. Grand fir and Douglas fir dominate the sparse forests. Plant associations encountered include Grand fir/Oceanspray, Grand fir/Snowberry and Douglas fir/Snowberry. The following plant species exist in this location:

- Trees: *Abies grandis, Larix occidentalis, Pinus contorta, Pinus ponderosa, Pseudotsuga menziessii,* and *Populus trichocarpa.*
- Shrubs: *Acer circinatum, Symphoricarpos alba, Symphoricarpos mollis, Holodiscus discolor, Castenopsis chrysophylla, Pachystima myrsinites, Sambucus cerulea, Rubus parviflora, Rosa gymnocarpa, Gaultheria ovatifolium* and *Berberis aquifolium.*
- Forbs: *Fragaria vesca, Solidago candensis, Epilobium angustifolium, Achillea millefolium, Achlys triphylla, Trientalis latifolia, Campanula scouleri* and *Anaphilis margaretaceae.*

Bear Creek Proposed OHV System

The forest series in this proposed OHV location include both *Abies amabilis* and *Tsuga mertensiana*. *Vaccinium membranaceum* is the dominant shrub throughout the proposed system and *Xerophyllum tenax* is the dominant forb. Overall there is very little species diversity.

ABAM/VAME/XETE and TSME/VAME/XETE were the only two plant associations encountered. Species present in this location include:

- Trees: *Abies amabilis, Abies lasiocarpa, Pseudotsuga menziessii, Tsuga heterophylla, Tsuga mertensiana* and *Pinus contorta.*
- Shrubs: *Vaccinium membranaceum, Rubas lasiococcus, Berberis nervosa, Rhododendron macrophyllum* and *Acer circinatum.*
- Forbs: *Xerophyllum tenax, Pteridium aquifolium* and *Linnaea borealis.*

Graham Pass Proposed OHV System

The Rho Ridge trail passes through a sensitve plant site for *Eucephalous gormannii* on the far north end of this proposed OHV location. This is an existing use and there would be no change in impacts. The plants in general are in rocky open spaces and are not at risk.

Mt. Defiance Proposed OHV System

In all alternatives, the system would remain open to street legal vehicles. From a botany and invasive plant perspective, there is not a significant difference between alternatives.

3.6.2. Effects Analysis

General Forest

All the action alternatives would reduce the risk of cumulative adverse impacts to PETS plants and other rare or uncommon species relative to the no action alternative across the entire Forest. Travel would be restricted to designated routes and OHVs would not impact sensitive plant sites or habitat. All the action alternatives, based on the Analysis Framework (Section 3.1), would prevent further resource damage to fragile areas, such as Camas Prairie and the Frying Pan Lake area. There would be a beneficial cumulative effect to all botany resources when combined with continued road closures and restoration projects under all the action alternatives.

Under all the action alternatives, OHVs would not be transporting new or existing weeds outside the designated OHV roads, trails, area, and staging areas on the Forest. Invasive plants could still be transported by street legal vehicles transporting the OHVs and weeds could still be transported off the Forest to homes or other OHV locations. There would be little difference between action alternatives for the general Forest area, but there would be much less risk of spreading noxious weeds by OHVs compared to the no action alternative. There would be a beneficial combined effect to the noxious weed program when combined with the existing noxious weed program under all action alternatives.

LaDee Flats Proposed OHV System

Direct, Indirect and Cumulative Effects for Sensitive Plant Species

No PETS species were found along the proposed OHV roads, trails and area at time of survey. The following Region 6 Sensitive Species were documented previously within the proposed location or vicinity: *Usnea longissima* beard lichen, *Pseudocyphellaria rainierensis* Rainier pseudocyphellaria lichen, *Peltigera pacifica* Pacific felt lichen, *Corydalis aquae-gelidae* cold water corydalis, and *Cimicifuga elata* tall bugbane. Only *Peltigera pacifica* was documented near a road and on the ground. The other two lichens are arboreal and not at risk from OHV activities. *Corydalis aquae-gelidae* is found in gravel associated with running water. It is not at risk. *Cimicifuga elata* is documented outside the proposed location and is not at risk. None of the sensitive plant sites would be affected by trail construction. The existing roads, trails, area, and staging areas would not affect any sensitive plant or other rare or uncommon plants. There are no direct, indirect or cumulative effects to botany sensitive plants under the action alternatives, but there is in indefinable continued risk from uncontrolled and unpredictable activities under current conditions which would remain under the no action alternative.

Direct, Indirect and Cumulative Effects for Invasive Plants

Roadside weeds include: *Hypericum perferatum, Prunella vulgaris, Chrysanthemum leucanthemum* and *Cersium Canadensis.* There is no notable weed problem in the LaDee Flats proposed OHV location. Since the proposed roads, trails and area are already heavily used, there is not likely to be much change in the weed population as a result of any of the alternatives.

The staging areas should not pose a weed problem. Based on the Analysis Framework (Section 2.2) there should be a reduced risk of noxious weed problems under all the action alternatives. There are no direct, indirect or cumulative effects for invasive plants.

McCubbins Gulch Proposed OHV System

Direct, Indirect and Cumulative Effects to Sensitive Plant Species

No PETS species were located in this survey. *Nephoroma occultum*, kidney lichen, a Region 6 Sensitive Species, is documented on the far west end of the proposed OHV location on the bole of a tree. It is not near any proposed trail. It is also an unexpected species to find here as it is far from its normal habitat.

Mountain lady slipper orchid is present on the eastern portions of the proposed OHV location. It is not a management species, but it is uncommon and is of concern to many members of the public. This orchid would be considered “charismatic mega-flora.” The existing and proposed trails do not affect any site under the action alternatives, but they would remain at risk under Alternative 1 (No Action). There are no anticipated effects from the staging areas. There are no direct, indirect or cumulative effects to sensitive plants under any alternative.

Direct, Indirect and Cumulative Effects to Invasive Plants

Notable weeds are hound’s tongue and knapweed. There is an ongoing treatment program here dealing mostly with roadsides for both species. Treatment of the trails is beyond both the financial and physical ability of current resources. Both weeds grow in open disturbed areas and are well established throughout the location. New trail construction would create new weed habitat along the edges of the trails and the OHVs would transport weed seeds. The hound’s tongue is a particular concern because it is widespread in the proposed OHV location and the seeds cling to clothing and animal fur. The weed is not currently found in any of the other proposed OHV locations, but could be spread. Based on the distribution of hound’s tongue over the last several years, the only other proposed OHV location with suitable or similar habitat is Rock Creek.

There are no indirect effects. Direct effects would be weeds establishing in new disturbance from trail construction. Cumulative effects would be the combined disturbance from OHVs, past harvest activities and cattle grazing. Native animals may spread weeds, but they are not considered here. Cattle utilize the easiest travel routes, such as roads, trails and open areas. The hound’s tongue seed clings to their fur in large quantities and is transported by them. They also create bare areas where they congregate or travel frequently. There are no effects from the staging areas.

Based on the assumptions, all the action alternatives would have fewer negative effects regarding noxious weed spread relative to Alternative 1 (No Action), which would not change the existing conditions and use. Among the action alternatives in ascending order based on total miles of trail and new construction, Alternative 4 would have the least negative effect followed by Alternative 2 and the greatest impact would be Alternative 3.

Rock Creek Proposed OHV System

Direct, Indirect and Cumulative Effects to Sensitive Plant Species

No PETS species were found in the proposed OHV location at time of survey. A Region 6 sensitive plant, *Botrychium minganense*, Mingan moonwort, is documented in some seeps within this proposed OHV location. The sites are too densely vegetated to expect OHV impacts and are not close enough to any OHV roads and trails to pose a problem.

Mountain lady slipper orchid is present on the eastern portions of the proposed OHV location, south of the campground. The proposed actions should not increase any risk to the population.

All proposed trails, roads, staging area, day use and new construction were considered. There would be no effects to sensitive plants under any alternative.

Direct, Indirect and Cumulative Effects to Invasive Plants

The most notable weed here is diffuse knapweed which is currently being treated. The plant community and general environment are similar to McCubbins Gulch, which has a serious problem with hound's tongue. There is a clear risk that seeds would or already have been transported to the activity location, but no hound's tongue has been reported here. Since the proposed OHV location is already heavily used by OHVs, there does not seem to be much change in risk of the hound's tongue becoming established. Wasco County treats the weeds here and they are familiar with hound's tongue. The staging area is already disturbed and heavily used, so there would not be a significant difference in effects from existing condition. No effects are expected from the staging area.

There are no indirect effects for travel routes. There would be the direct effect of creating new weed habitat from trail construction. There would be a cumulative effect when the disturbance is combined with the disturbance from past timber harvest and fuels reduction activity. The direct and cumulative effects from the action alternatives are relatively minor with little difference between action alternatives relative to the total of all activities.

The fuel reduction activities like underburns, fuel reduction projects, and thinning have created very open stands where OHV travel is not impeded by brush and dense trees. Under Alternative 1 (No Action), OHVs would be allowed to travel cross-country except where specifically restricted. Currently, there is a great deal of off-road use whether legal or not in the open areas in the Rock Creek OHV location and vicinity. Knapweed and many other weeds are transported by vehicles as seeds or plant fragments that spread the weeds. Under the no action alternative there would be a cumulative and direct effect from off-road travel continuing to increase as a result of the reduction in brush, down fuels, and dense trees that impede off-road travel.

Based on the assumptions, all the action alternatives would reduce direct negative effects regarding noxious weed spread relative to the no action alternative, which would not change the existing conditions and use. Among the action alternatives based on total miles of trail and new construction, Alternative 4 would have the most positive effect followed by Alternative 2 and Alternative 3.

Peavine Proposed OHV System

Direct, Indirect and Cumulative Effects for Sensitive Species.

No PETS species were found in the Peavine proposed OHV location at time of survey. The Region 6 Sensitive Species *Nephroma occultum*, kidney lichen, was documented in the southwest part of this proposed OHV location. It is not close to any route and is an arboreal species not likely to be effected. There are no effects to sensitive plants from staging areas or proposed roads and trails under any of the action alternatives.

Direct, Indirect and Cumulative Effects to Invasive Plants

There are no notable weed issues in this proposed OHV location. There are no effects to invasive plants under any of the alternatives.

Gibson Prairie Proposed OHV System

Direct, Indirect and Cumulative Effects to Sensitive Plant Species

No PETS species were found in this proposed OHV location at the time of survey. The following Region 6 Sensitive plant *Botrychium minganense*, Mingan moonwort, is documented in some seeps within the location. The sites are too dense to expect OHV impacts and are not close enough to any routes to pose a problem. *Arabis sparsiflora var. atrorubens*, sickle pod rockcress is present in several areas especially the ridge on the westside. It is adjacent to a couple of routes, but would not be affected. There are no effects to sensitive plants from either proposed roads and trails or staging areas.

Direct, Indirect and Cumulative Effects to Invasive Plants

The predominate weeds here are diffuse knapweed and meadow knapweed. There is little or no treatment occurring at present. There would be no effects under Alternatives 1 and 4 because no OHV roads and trails would be designated and cross-country travel is prohibited. As such, there would be no legal OHV use.

Under Alternative 2, there would be about four miles of new construction and about one mile under Alternative 3, which would create some disturbance with potential spread of weeds along the roads and trails. The direct effects would be a minor increase in weed habitat and spread of knapweeds. There are no indirect effects. A minor cumulative effect would be an increase in disturbance in addition to the disturbance from grazing and harvest activities.

Bear Creek Proposed OHV System

Direct, Indirect and Cumulative Effects to Sensitive Plant Species

No PETS species were found in the Bear Creek proposed OHV roads and trails or staging areas at time of survey. There are no known PETS species in the proposed location, staging area or vicinity. Since no sensitive plants are present, there is no effect to sensitive plants and no difference in effects between alternatives.

Direct, Indirect and Cumulative Effects to Invasive Plants

There are no effects under Alternatives 1 and 4; therefore, this discussion refers only to Alternatives 2 and 3. Meadow knapweed is the most serious weed in the proposed OHV location and has a spotty distribution with most sites on the 16 and 1630 roads. There has been no treatment in the proposed OHV location and no treatment is proposed at present. The weeds are mostly restricted to sunny disturbed open areas along the road. The issue is that trail construction would create suitable habitat for meadow knapweed and OHVs would transport seeds along the trails. PDC IP-3 states, "No new trail construction would occur in the Bear Creek location until all existing invasive plant sites have been treated. Treatment would follow the Mt. Hood Site Specific Invasive Plant Treatment Environmental Impact Statement Record of Decision and Final Environmental Impact Statement (2005)." This PDC would reduce the spread of noxious weeds into new or existing disturbance areas, such as new trails and staging areas. It would not guarantee that there would be no new invasive plant sites.

Direct effects would be increasing the total area vulnerable to weed infestation and transporting weeds to those sites. There would also be an increased risk of infestation from increased traffic by OHV operators transporting in weeds from off site. This includes introduction of more of the same species that occur here now as well as possible other invasive species not currently documented here. There are no indirect effects. Cumulative effects would be an increase of disturbance area subject to weed infestation from this project added to the existing sites along roads.

Graham Pass Proposed OHV System

Direct, Indirect and Cumulative Effects to Sensitive Plant Species

Rho Ridge trail passes a sensitive plant site for *Eucephalous gormannii* on the far north end. This is an existing use and there would be no change in impacts. The plants in general are in rocky open spaces and are not at risk.

Under Alternatives 1 and 3, the effects would be **May Impact Individuals or Habitat**, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species. Under Alternatives 2 and 4, there could be a beneficial effect with the reduction of possible impact to the sensitive plant site. There are no indirect or cumulative effects.

Direct, Indirect and Cumulative Effects to Invasive Plants

There are no inventoried weed sites along the proposed OHV roads and trails or any current weed issues here. There would be no effects to invasive plants under any alternative.

Mt. Defiance Proposed OHV System

Direct, Indirect and Cumulative Effects to Sensitive Plant Species

There are no known or suspected sensitive plants in the vicinity; therefore there is no effect to sensitive plants at this proposed OHV system.

Direct, Indirect and Cumulative Effects to Invasive Plants

The inventoried invasive plants along the roads here are tansy ragwort, Scotch broom, and knapweeds. Since there would not be any new disturbance and the only difference between alternatives would be the exclusion of non-street legal vehicles, there would no effect.

3.6.3. Incomplete and Unavailable Information

Information about the current user create trails and illegal activity could have provided a better understanding of Alternative 1 (No Action) and would have facilitated a better analysis of cross-country travel by OHVs.

3.7. Aquatic Conservation Strategy

In order for a project to proceed, “a decision maker must find that the proposed management activity is consistent with the Aquatic Conservation Strategy objectives” (NWFP ROD B-10). There are nine objectives, which are listed on page B-11 of the ROD. Key parameters or indicators that make up elements of the nine Aquatic Conservation Strategy objectives help determine if a project would restore, maintain, or degrade the aquatic environment. Once this determination is made, the indicators are examined together to ascertain whether the project is consistent with the objectives. The following table displays the individual indicators and the effect the alternatives have on those indicators at the 5^{th}, 6^{th} and 7^{th} field watershed scale. Fifth field watersheds are generally large in size (40,000 acres to 250,000 acres), while 6^{th} and 7^{th} field watersheds are smaller (5,000 acres to 40,000 acres and 2,000 acres to 5,000 acres, respectively).

Table 3-99. ACS indicators and alternative effects.

	Alternative 1			Alternatives 2, 3 and 4		
Indicators	**Restore**	**Maintain**	**Degrade**	**Restore**	**Maintain**	**Degrade**
Water Quality						
Temperature		X			X	
Sediment		X		X (Improvement might be detected at the 5th field scale while short-term degradation might be detected at the 7th field watershed scale)		
Chemical contamination		X			X	
Habitat Access						
Physical barriers		X			X (slight improvement*)	
Habitat Elements						
Substrate		X			X	
Large woody debris		X			X	
Pool frequency		X			X	
Pool quality		X			X (degrade in the short-term*)	
Off-channel habitat		X			X	
Refugia		X			X	
Channel Conditions and Dynamics						
Width/depth ratio		X			X	
Streambank condition		X			X	
Floodplain connectivity		X			X (slight improvement*)	
Flow/Hydrology						
Peak/base flows		X			X	
Drainage network increase		X			X (slight improvement*)	
Watershed Conditions						
Riparian reserves		X			X (slight improvement*)	

"Restore" means the action(s) would result in acceleration of the recovery rate of that indicator. "Maintain" means that the function of an indicator does not change by implementing the action(s) or recovery would continue at its current rate. "Degrade" means changing the function of an indicator for the worse.
*These changes are very localized and might be detected at the 7th field watershed scale, but not in 5th or 6th fields.

The following summarizes Table 3-99:

- Alternatives 2, 3 and 4 propose to decommission roads which would restore areas to a more natural sediment regime that is less chronic and more episodic in nature, as well as provide some benefits to floodplain connectivity, Riparian Reserves and decreasing the drainage network associated with the roads (see Range of Natural Variability in Appendix H). Removing stream crossings and associated road fill would open up more connectivity while installation of waterbars and other drainage features would hydrologically "disconnect" roads from streams. Benefits may be noticeable at the 7^{th} field sub-watershed scale but unlikely detectable at the 5^{th} and 6^{th} field scale. These alternatives may cause some minor short-term sediment introduction during implementation leading to loss of some pool quality, but would provide long-term benefits as areas revegetate and sediment is moved through the system.

- Alternatives 2, 3 and 4 eliminate potential cross-country OHV travel on approximately 394,886 acres of National Forest land. It is expected that eliminating cross-country travel will restore a more natural sediment regime in areas that have this use around stream channels, wetlands and lakes. Benefits would likely be noticeable at the 5^{th} field watershed scale.

- Indicators other than those described in the bullet above would be maintained as outlined in the effects analysis above.

The following table displays specific Aquatic Conservation Strategy objectives and the indicators from the previous table that comprise each objective. All of the indicators that are checked for a particular objective should be evaluated together to determine whether the action maintains or enhances the specific Aquatic Conservation Strategy objective.

Table 3-100. ACS objectives and indicators that comprise each objective.

	Aquatic Conservation Strategy Objectives								
Indicators	**#1**	**#2**	**#3**	**#4**	**#5**	**#6**	**#7**	**#8**	**#9**
Temperature		X		X				X	X
Sediment				X	X	X		X	X
Chemical Contamination				X				X	X
Physical Barriers	X	X						X	X
Substrate			X		X	X			X
Large Woody Debris			X					X	X
Pool Frequency			X						X
Pool Quality			X						X
Off-Channel Habitat	X	X	X						X
Refugia	X	X						X	X
Width/Depth Ratio			X					X	X
Streambank Condition			X			X		X	X
Floodplain Connectivity	X	X	X				X	X	X
Peak/Base Flows					X	X	X		
Drainage Network Increase					X	X	X		
Riparian Reserves	X	X	X	X	X	X		X	X

The following is a summary the Aquatic Conservation Strategy objectives (NWFP ROD B-10) and how the action alternatives would influence them at the 5th field watershed scale:

1. **Maintain The Distribution, Diversity And Complexity Of Watershed And Landscape-Scale Features.** Implementation of the Aquatic Conservation Strategy, which includes designating Riparian Reserves, is intended to maintain or enhance the development of a diverse, healthy riparian area while protecting it with a variety of mitigation measures and design criteria. No new road crossings of perennial streams or wetlands are proposed and several existing crossings would be removed, which would decrease the current level of aquatic habitat fragmentation. Up to sixteen new trail crossings are proposed but the crossings would be constructed to minimize aquatic habitat fragmentation by utilizing bridges and properly sized culverts where appropriate. These crossings would not result in any long-term aquatic habitat fragmentation.

2. **Maintain Spatial And Temporal Connectivity Within And Between Watersheds.** The project would increase the spatial and temporal connectivity within and between watersheds due to culvert removal and road decommissioning. New major stream crossings associated with the trail construction would be bridges or other crossing types that would be designed to allow unimpeded passage of water and sediment. This would maintain spatial and temporal connectivity.

3. **Maintain The Physical Integrity Of The Aquatic System, Including Streambanks, Side channels (Refugia), And Channel Bottom Configurations.** This project would meet this objective through mitigation measures, design criteria and the protection provided by Riparian Reserves. Mitigation measures and design criteria aimed at reducing soil compaction and erosion, trail and staging area location and construction that would minimize erosion and sedimentation and proper design of stream crossings would greatly reduce risks of sedimentation and resulting bank erosion and channel bed scour. These measures are discussed in detail in the Soil Productivity, Water Quality, and Fisheries sections.

4. **Maintain Water Quality Necessary To Support Healthy Ecosystems.** This project would meet this objective through mitigation measures, design criteria and protection provided by Riparian Reserves. Design criteria aimed at reducing erosion would maintain the reduce sediment levels in the long-term. Other PDC guiding the placement and design of staging areas would substantially reduce the likelihood of chemicals entering adjacent waterways. These measures are discussed in detail in the Soil Productivity, Water Quality, and Fisheries sections.

5. **Maintain Sediment Regimes.** This project would enhance this objective in the long run through culvert removal, road decommissioning and elimination of cross-country OHV travel. In addition, design criteria discussed in detail in the Soil Productivity, Water Quality, and Fisheries sections in Chapter 3 would minimize sediment introduction in the short and long-term.

6. **Maintain In-Stream Flows That Are Closer To Natural Regimes.** This project would meet this objective through mitigation measures, design criteria and protection provided by Riparian Reserves. Road decommissioning would "disconnect" the road system from streams which should move runoff toward a more natural rate.

7. **Maintain The Timing, Variability, And Duration Of Floodplain Inundation.** This project would meet this objective through mitigation measures, design criteria and protection provided by Riparian Reserves. Road decommissioning would "disconnect" the road system from streams which should move runoff toward a more natural rate. Floodplains are extremely limited in this area due to the steep nature of the landscape.

8. **Maintain The Species Composition And Structural Diversity Of Plant Communities In Riparian Areas And Wetlands.** This project would meet this objective through protection provided by Riparian Reserves and elimination of cross-country OHV travel.

9. **Maintain And Restore Habitat To Support Well-Distributed Populations Of Native Plant And Riparian Dependent Species.** The project would meet this objective with design criteria, protection provided by Riparian Reserves, road decommissioning and elimination of cross-country OHV travel.

3.8. Heritage Resources

This analysis is based on the information found in the Heritage Resources Report for this project, which is in the project record located at the Forest Headquarters Office in Sandy, Oregon.

3.8.1. Affected Environment

Archaeological research indicates initial human use and occupation of the Forest during the Early Archaic period ca. 8,500-5,000 BP (Oetting 2004:17, Oetting 2006:69). Cultural/historical models proposed for the area suggest a shift from a broad-spectrum foraging adaptation in the Early Archaic to an intensive semisedentary foraging adaptation by the Late Archaic period, ca. 2,500 BP (Burtchard 1990, Burtchard et al. 1993). Hundreds of pre-contact archaeological sites are found throughout the Forest. These sites are associated with a variety of landform types between 1,000 and 6,500 feet abmsl. Over 50% of the recorded pre-contact sites are found at elevations over 3,500 feet absml (Burtchard and Keeler 1991:112).

In the early 19th century, at the time of contact with Europeans and Americans, a number of different indigenous groups utilized the area. To the north and northwest were various Chinookan or Kiksht-speaking groups such as the Clackamas, Multnomah, and Cascades people. To the southwest were the Northern Molala, a group of Penutian speakers, and to the east the various bands often grouped together as the Tenino, who spoke the Northern Sahaptin language. Descendent families today are affiliated with the Confederated Tribes of Warm Springs, Confederated Tribes of the Grand Ronde, and the Siletz Tribe.

Non-native use of the area accelerated following the opening of the Barlow Road, an emigrant wagon road to the Willamette Valley on the south side of Mt. Hood. The road was completed in 1845, ultimately bringing settlement closer to the flanks of the Cascades during subsequent decades. Federal land management had its beginnings with the creation of the Cascade Range Forest Reserve in 1893. Initially managed by the Department of the Interior, the lands were transferred to the Department of Agriculture in 1905, and administered by the U.S. Forest Service as the Oregon National Forest by 1908. The name was changed to Mt. Hood National Forest in 1924.

Past human use of the landscapes within Forest was shaped to a large extent by resources, topography, land-use patterns, economy, and transportation systems specific to a particular area. The patterns of historic use are significantly different from area to area. These differences have led other researchers to consider the significance of heritage resources from the perspective of well-defined historic/geographic areas, each with distinctive developmental histories (Burtchard and Keeler 1991). Given the spatial distribution of the proposed OHV locations, a separate cultural context was developed for each of the areas. Expanded context statements are incorporated in individual Heritage Resource Survey Reports for specific areas. They are important for developing survey expectations and for the evaluations of heritage site significance.

LaDee Flats Proposed OHV System

The majority of OHV roads, trails, and one area considered within this analysis area are located on LaDee Flat, a plateau separating the North Fork Clackamas and Clackamas Rivers just above their confluence, and approximately 10 miles southeast of the city of Estacada, in Clackamas County. Elevations range from approximately 1,600 feet to 2,400 feet abmsl. This OHV location also includes Forest Road 4610 as a linear extension to the east, from LaDee Flat to the divide separating the Salmon River watershed from the Roaring River watershed. Much of this route follows a ridgeline where elevations exceed 4,000 feet abmsl.

Archaeological sites along the nearby Clackamas River include a number of seasonal use locations and residential base camps occupied throughout the pre-contact period. Several pre-contact archaeological sites have been identified on LaDee Flat and along the ridge system associated with the eastern leg of Forest Road 4610.

Information concerning specific Native American use of the area in the early historic period is generally lacking. Ethnographic and ethnohistoric sources indicate that the area was within the traditional use territory of the Clackamas and Northern Molala peoples. Clackamas villages were reportedly located along the river as far upstream as Estacada, and possibly further (French et al. 1995). Available data are less specific for the Northern Molala, who frequented the uplands of the Clackamas watershed during the summer months. Nineteenth century maps depict an Indian trail traversing LaDee Flat. The trail extended from the Willamette Valley to the Warm Springs Indian Reservation (Burtchard and Keeler 1991:139, Paullin 2007:64).

The earliest non-native historic use of the LaDee Flats OHV location was likely by prospectors and hunters during the late nineteenth century. Several families established homesteads in the Clackamas River valley near present-day Estacada in the 1850s and 1860s, and there were settlers on the North Fork Clackamas River and LaDee Flats by 1890, before the Cascade Range Forest Reserve was established (McClure 2006:11-12; Oetting 2006:27). General Land Office records show multiple land claims on LaDee Flats by 1891, and several homestead cabins in the area, with access by way of the old Indian trail. Much of the area also consisted of Oregon and California Railroad (OCRR) land grant parcels. A 1916 Forest Service map indicates that virtually all of LaDee Flats was alienated land within the Oregon National Forest.

By 1921, the majority of OCRR lands and other private lands on LaDee Flats had been purchased by the Union Lumber Company. Over the next decade most of the area was logged by the Porter Logging Company and LaDee Logging Company under contract to the Union Lumber Company (Paullin 2007). Two logging camps and a system of railroad lines were established in the area. After a major fire led to the failure of the Union Lumber Company in 1931, their lands were conveyed to the federal government and they became part of the Forest. Numerous archaeological sites and features associated with the historic logging operations are found in the LaDee Flats area. Much of the existing road system was initially constructed as part of the logging railroad system. Between 1934 and 1936 the Civilian Conservation Corps (CCC) graded and improved some of the roads in the area and constructed the eastern leg of Forest Road 4610, also known as the Abbott Road.

Table 3-101. Summary of heritage resources for the LaDee Flats proposed OHV system.

Site No.	Type	OHV Road/Trail	Alt 2	Alt 3	Alt 4
665EA13	Historic logging camp	4611	★	★	★
665NA91	Precontact lithic scatter	4610115	★	★	★
665EA134A	Historic logging railroad	multiple	★	★	★
665NA135	Precontact lithic scatter	new construction	★	★	★
665NA145	Precontact lithic scatter	4610	★	★	
665NA146	Precontact lithic scatter	4610	★	★	
665NA169	Precontact lithic artifact	4610015	★	★	★
665NA175	Precontact lithic artifact	4611130	★	★	★
665EA226	Historic road	4610	★	★	

Peavine Proposed OHV System

The proposed Peavine OHV roads and trails are located on the crest of the Cascades near the headwaters of the Clackamas River and the Warm Springs River, approximately 21 miles northeast of Detroit, Oregon, in Clackamas and Wasco Counties. Elevations within the analysis area range from approximately 3,777 to 5,577 feet abmsl. The area takes its name from Peavine Mountain (4,812 feet), a prominent landform in the northwest corner of the proposed OHV location. The Pinhead Buttes, a group of higher mountains, are located at the southern end of the project area.

Several pre-contact archaeological sites have been previously documented in the project area, but the age of the sites is undetermined. Most are low-density lithic scatters associated with hunting activities, food gathering and processing, and tool maintenance (Burtchard and Keeler 1991:84). Excavations at the nearby Posy Ridge sites, across the Collawash River, to the west, have provided evidence of similar upland use of the general area between ca. 4,000 and 1,000 years BP (Burtchard 1994:169).

Ethnographic data and historic sources indicate that during the early post-contact period the project area was within the traditional territory of the Northern Molala people. Winter settlements were in sheltered locations at lower elevations, and consisted of one or more extended family households. The closest settlements to the project area were along the North Fork Molalla River. In the late summer Molala families would travel to higher mountain elevations to collect and process huckleberries (Zenk and Rigsby 1998:444).

Use of the area by non-native Euroamerican people began in the 1880s, when sheep ranchers from the eastern slope of the Cascades began using the high country along the crest as summer range for sheep herds. Forest Service management in the early years of the agency was oriented toward grazing administration and fire protection. The project area was remote with access limited initially to a trail that followed the crest of the Cascade Range south from Clackamas Meadows and known as the Skyline Trail. A ranger station was established at Clackamas Meadows in 1907 and another on Lemiti Creek, south of the present project area, in 1910. The Skyline Trail became an important link for administrative access and patrols by horseback rangers and forest guards.

While the earliest non-native use of the area was primarily associated with administration of the Forest Reserve and National Forest, grazing became important early in the 20th century. Most of the Peavine analysis area was at some time part of the Conroy, or Peavine sheep allotment, under permit to the Forest Service from 1909 to 1943. Tygh Valley stockman John J. Conroy and his employees annually brought herds of sheep to summer range by way of the Skyline Trail. By the 1920s, public recreational use of the area was gaining popularity, and the Skyline Trail was replaced by the Skyline Road. With increased emphasis on timber management in the post World War II period, the road system within this area was expanded to provide access to harvest areas.

Table 3-102. Summary of heritages resources for the Peavine proposed OHV system.

Site No.	Type	OHV Road/Trail	Alt 2	Alt 3	Alt 4
663EA23	Historic fire lookout site	4661205	★	★	
663NA215	Precontact lithic scatter	4200032	★	★	
663EA220	Historic fire lookout site	4230120	★		
663EA222	Historic trail	4230000	★		
663NA319	Precontact lithic scatter	new construction	★		
663EA313	Historic road	4240	★		

Graham Pass Proposed OHV System

This proposed OHV location is at the southern end of the Forest, along Rhododendron Ridge, which separates the Collawash River watershed from the upper Clackamas River watershed. The location is 12 miles northeast of the town of Detroit, in Clackamas and Marion Counties. Elevations range from 4,360 to 5,200 feet abmsl.

The pattern of archaeological site distribution in this area suggests a pattern of pre-contact use of Rhododendron Ridge as a travel route between the upper Clackamas River basin and the upper Santiam River basin. Archaeological sites are typically associated with ridgeline saddles and meadow areas. Artifact types include projectile points typical of the Early and Middle Archaic periods.

During the early 19th century the area was within the traditional territory of the Northern Molala, or possibly shared territory of the Northern Molala and the Upper Santiam Molala subgroup (Zenk and Rigsby 1998:440, 445). A General Land Office (GLO) survey from 1894 indicates an Indian trail ascending Rhododendron Ridge from the west. Another Indian trail traversed the divide in the vicinity of Collawash Mountain, which appears on early maps as Huckleberry Mountain (French et al. 1995).

Non-native use in the early 20th century was primarily for stock grazing under permit to the Forest Service. Sheep were trailed from Wasco County ranches east of the Cascades to summer range in the Rhododendron Ridge Sheep Range. Fire protection was an important management emphasis. Fire lookouts were built on Hawk Mountain and Mt. Lowe in the 1930s, and linked by telephone line. Forest Service land management shifted to intensive timber extraction in the period following World War II. The first road was built to Graham Pass in the late 1950s. Most of the road system within the analysis area was constructed between 1960 and 1966 for Forest Service timber sales.

Table 3-103. Summary of heritage resources for the Graham Pass proposed OHV system.

Site No.	Type	OHV Road/Trail	Alt 2	Alt 3	Alt 4
663EA20	Historic fire lookout site	Trail 564		★	
663NA58	Precontact rock feature	Trail 564		★	
663NA93	Precontact lithic scatter	Trail 564		★	
663NA94	Precontact lithic scatter	6350		★	
663NA104	Precontact lithic scatter	Trail 564		★	
663NA223	Precontact lithic scatter	Trail 564		★	
663NA224	Precontact lithic scatter	Trail 564		★	

McCubbins Gulch Proposed OHV System

Adjacent to the north boundary of the Warm Springs Indian Reservation, the proposed McCubbins Gulch OHV location is situated on the watershed divide between the White River and Beaver Creek, a major tributary of the Warm Springs River. The analysis area is approximately 10 miles west of the community of Wapinitia, in Wasco County. Elevations range from 3,000 feet to 3,559 feet abmsl.

Based on proximity, the pre-contact history of the McCubbins Gulch analysis area is undoubtedly linked to that of the lower Deschutes River basin, including adjacent portions of the Warm Springs Indian Reservation. The distribution of archaeological resources suggests relatively low intensity transient use of the general area throughout the pre-contact period. Artifacts recovered at site 662NA93, within the project area, provide evidence of use during the Early Archaic period.

At the time of Euroamerican contact the general area appears to have been jointly utilized by Northern Molala people, with villages west of the Cascades, and the *tayxłáma,* a Sahaptin-speaking group who had a winter village in Tygh Valley (Hunn and French 1998:393, Zenk and Rigsby 1998:440). Neighboring groups, such as the *tiłxniłáma* at Sherar's Bridge and the *mliłáma* at Simnasho may also have used the area. A trail from Tygh Valley passing through the McCubbins Gulch area provided access to huckleberry fields at the crest of the Cascades. A camp used by people enroute to the berry fields was located in the Camas Prairie vicinity (Abbot 1857).

In 1855, U.S. Army Lt. Henry L. Abbot led a survey party on a reconnaissance trip from Tygh Valley across the Cascades to Oregon City, following an Indian trail through the project area. By the 1860s non-native settlers had established ranches in the Tygh Valley area. To improve access and transportation, the Oak Grove Wagon Road was opened in 1869 from Wapinitia to Oregon City. Portions of Forest Roads 2130, 2640, 4130, Oregon State Highway 26, and Oregon State Route 216 follow or occupy the historic route. Settlement within the McCubbins Gulch analysis area was limited to a single homestead at Camas Prairie in the 1880s. Logging and lumber production began in the 1880s, when a sawmill was in operation west of Camas Prairie. The Clear Creek Ditch system was developed between 1885 and 1920 to divert water from Clear Lake to Juniper Flat for agriculture (Musser 1984).

The Camas Prairie Ranger Station was established in 1908 at the junction of the Oak Grove Wagon Road and the trail to Clackamas Lake. Early federal land management included timber sales and grazing permit administration. The entire area was used for open range cattle grazing in the early 20th century. Records indicate 30 separate permittees and 1033 head of cattle used the area in the spring (U.S. Forest Service 1924). Cattle were driven from the permittees home ranches, scattered between Tygh Valley, Maupin and Wapinitia.

Post-contact, historic period archaeological resources in the general area are largely associated with grazing, timber extraction, lumber production, and water control activities (Burtchard and Keeler 1991:146).

Table 3-104. Summary of heritage resources for the McCubbins Gulch proposed OHV system.

Site No.	Type	OHV Road/Trail	Alt 2	Alt 3	Alt 4
662EA13	Historic wagon road	4310		★	
662NA93	Precontact lithic scatter	existing trail	★	★	★
661EA259	Historic irrigation ditch	existing trail	★	★	★

Rock Creek Proposed OHV System

The proposed Rock Creek OHV roads and trails are located in the White River watershed, Wasco County, approximately 12 miles west of the town of Wamic. In addition to the system of roads and trails located west of Rock Creek Reservoir, the study area includes the Badger Lake road. Elevations in the study area range from 2,320 feet on Gate Creek to 4,472 feet abmsl at Badger Lake.

Archaeological investigations at site 661NA131, within the proposed OHV day use location, provide evidence for occupation of the Rock Creek area during the Early Archaic period (Smith 2001). Site size, artifact density and tool classes suggest possible residential use. Archaeological site 661NA195 at Badger Lake provides evidence of more transient use of higher elevation areas during the Early Archaic. Artifact material from site 661NA100 on Gate Creek indicates possible contact period use of the area by local native people.

As with nearby McCubbins Gulch, this proposed OHV location may have been jointly utilized by the Northern Molala and the *tayxłáma,* a Sahaptin-speaking group who had a winter village in Tygh Valley (Hunn and French 1998:393, Zenk and Rigsby 1998:440). A neighboring group, the *tiłxniłáma* at Sherar's Bridge, may also have used the analysis area.

Non-native use of the general area followed completion of the Barlow Road, an emigrant route to the Willamette Valley. Samuel Barlow operated a toll station on the wagon road at Gate Creek from 1846 to 1852. By the early 1860s several ranchers had settled in Tygh Valley and at Wamic, and by 1872 on Gate Creek. Logging and lumber production began in the area by the 1890s and several small sawmills were established within the project area to cut ponderosa pine (Horn 1987:24-26). Forest Service land management after 1905 included timber sale administration as well as grazing permit administration. During the early 1900s most of the area was a part of the Wamic Horse and Cattle Range. Other historic developments within the project area include the construction of irrigation ditches by the Rock Creek and Gate Creek Ditch Company ditch in the early 1920s and the construction of Rock Creek Dam and Reservoir by the Works Progress Administration (WPA) in 1939-1940.

Table 3-105. Summary of heritage resources for the Rock Creek proposed OHV system.

Site No.	Type	OHV Road/Trail	Alt 2	Alt 3	Alt 4
661IS39	Precontact artifact (isolate)	4860130	★	★	★
661NA131	Precontact residential site	Day Use Area	★	★	
661EA149	Historic telephone line	multiple	★	★	★
661EA334	Historic irrigation ditch	Proposed bridge	★		

Gibson Prairie Proposed OHV System

Gibson Prairie, at the center of this proposed OHV location, is approximately four miles southeast of Parkdale, in Hood River County. Elevations range from 3,200 feet to 4,200 feet abmsl.

Pre-contact use of the general area is indicated by lithic scatters of indeterminate age. Culturally modified cedar trees provide evidence of use by native people in the contact period and historic period. The peeled cedar trees are associated with resource collection and basketry manufacture for huckleberry gathering. Both the Surveyors Ridge Trail (#688) and the North Section Line Trail (#451) probably followed earlier Native American trails.

Historic tribal groups using this area likely included Chinookan (Kiksht) speaking people from the lower Hood River Valley and Columbia River villages near the modern community of Hood River. They are usually referred to as the Hood River (*gigwálat*) or Dog River Indians (French and French 1998:375), and are frequently grouped with the Wasco.

Grazing was an important activity in this area at the time the Forest was established (Burtchard and Keeler 1991:145). Attempts at homesteading followed the Forest Homestead Act of 1906. Cut hay was transported to markets in Mosier and The Dalles from Long Prairie. A Forest Service ranger station was established at Long Prairie for general administration of the area. A fire lookout was later constructed at Rim Rock, overlooking the Upper Hood River Valley.

Table 3-106. Summary of heritage resources for the Gibson Prairie proposed OHV system.

Site No.	Type	OHV Road/Trail	Alt 2	Alt 3	Alt 4
661EA340	Historic Trail		★	★	

Bear Creek Proposed OHV System

The proposed Bear Creek OHV roads and trails are located north of Mt. Hood at the upper reaches of the Middle Fork Hood River watershed. The analysis area is approximately six miles southwest of Parkdale, in Hood River County. Elevations range from 3,280 feet to 4,800 feet absml.

Several pre-contact archaeological sites occur in the general area, including low density lithic scatters and ridgetop rock feature sites. The character and content of the lithic scatters suggests transient seasonal use, but dating of these sites has been inclusive. The Blue Ridge-Red Hill area is noteworthy for its concentration of rock feature sites, including constructed talus pit, trench, cairn, and mound complexes. The majority of these sites share characteristics that suggest ritual/spiritual use as a plausible function (Winthrop et al. 1995:92).

This area was likely used in the early historic period by Chinookan (Kiksht) speaking people from the lower Hood River Valley. Trails from the Columbia River ascended both the West Fork Hood River and Middle Fork Hood River near the project area (French et al. 1995). There are no specific references to traditional native uses for this area.

Following non-native settlement in the upper Hood River Valley, several homesteads were established along the northern and eastern boundaries of the project area in the period 1906-1914 under the authority of the Forest Homestead Act. Sheep grazing in the area began by 1911 (Burtchard and Keeler 1991:144). Early administration of the national forest included the development of a trail system, phone lines, and guard stations. Clear Creek Ranger Station was the primary Forest Service administrative site in the area. A guard station was also constructed on Tony Creek. A network of trails and phone lines connected these stations, and by the late 1930s a road was built into the upper Bear Creek watershed.

Table 3-107. Summary of heritage resources for the Bear Creek proposed OHV system.

Site No.	Type	OHV Road/Trail	Alt 2	Alt 3	Alt 4
666EA30	Historic trail	new construction	★	★	
666EA40	Historic USFS guard station	1631	★	★	

Mt Defiance Proposed OHV System

This small OHV location is approximately eight miles west of Hood River in Hood River County, on the eastern slopes of Mt. Defiance. Elevations range from 3,520 feet to 4,960 feet abmsl at the summit of Mt. Defiance.

Pre-contact archaeological resources in the general area include rock feature sites of undetermined age. These sites are characterized by constructed pits and cairns. Function is probably associated with ritual/spiritual use of Mt. Defiance. During the early historic period, this area was in close proximity to settlements of the Hood River (*gigwálat*) or Dog River Indians, particularly the village of *ninułdidix*, located west of present-day Hood River (French and French 1998:362-363).

Except for Mt. Defiance, much of the analysis area was alienated land within the Forest until the 1930s. The summit of Mt. Defiance was used as a fire lookout station as early as the 1920s, and has been the site of at least three fire lookout structures (Kresek 1984:33).

3.8.2. Effects Analysis

The analysis of alternatives provides a summary of the heritage resources identified in each of the proposed OHV systems, with a consideration of site significance and potential project affects. Site significance is based on the criteria of the National Register of Historic Places (36 CFR 60.6). Potential project affects were assessed using the criteria set forth in 36 CFR 800.

Alternative 1 – No Action

The analysis of potential effects for Alternative 1 was based on cumulative heritage resource inventory data generated from individual project field surveys totaling 695,141 acres within Forest. The area comprises about 65% of the Forest, and approximately 85% of those areas currently open to motorized recreation use. A total of 1,322 archaeological and historic above-ground resources have been identified within the surveyed areas. A review of the existing site records indicates that 154 of these resource locations are currently accessible to OHV use and vulnerable to the direct impacts of motorized recreational use. The majority are pre-contact surface scatters of lithic artifact material, exposed following removal of surface vegetation through timber harvest, road construction, and the establishment of user-created dispersed camping areas. Several historic-period linear resources, including intact segments of the Barlow Road, railroad logging features, and at least one irrigation ditch are included.

Criteria used to assess site vulnerability were based on accessibility. All of the 154 resource locations identified as potentially vulnerable are within old skid trails, undeveloped camping areas, decommissioned native surface roads, or openings that are adjacent to or visible from Forest Service system roads. Of this number, 22 are pre-contact archaeological sites where OHV use damage has been documented and is, in some cases, ongoing. Adverse effects documented as a result of OHV use include denuding of vegetation, soil exposure, rutting, and erosion, horizontal displacement of artifact material, and artifact breakage.

Extensive damage has been documented at several sites, severely compromising the integrity of subsurface archaeological deposits. At site 665NA135, located in the LaDee Flats area, detailed mapping indicated that nearly 40% of the site shows disturbance from "four-wheeler enthusiasts" who have created a mud bog and ruts up to 70 centimeters deep within the site boundaries. Site 661NA131, a significant Early Archaic period residential site near Rock Creek Reservoir, "mud-bogging and dirtbiking" has expanded areas of soil exposure and increased erosion (Smith 2001). In the McCubbins Gulch location, an "extensive network of motorcycle trails" has caused severe erosion problems at site 662NA93, another pre-contact occupation with evidence of Early Archaic use. At Clear Lake, off-road motorized recreation has created ruts and general ground disturbance within six different resource locations. Annual monitoring of these sites has shown an increase in OHV use since 1991.

Under Alternative 1, OHV use would be allowed to continue in all of the areas where damage to archaeological resources has been documented. Continued use would result in adverse effects to a minimum of 22 archaeological sites, and leave a minimum of 127 known resources (archaeological sites and historic linear features) vulnerable to potential damage.

Cumulative Effects

Implementation of the No Whisky Plantation Thinning project (fall 2008) included installation of boulder barriers to restrict OHV use in the proposed LaDee Flats OHV location. This action may halt the ongoing OHV impacts previously documented at three pre-contact archaeological sites. Under Alternative 1, however, unrestricted OHV use and adverse effects would likely continue within 19 other archaeological sites where existing damage has been documented. Many other sites would remain vulnerable. Given the increasing OHV use in some areas of the Forest, it is likely that previously undamaged sites adjacent to system roads would be subject to impacts of new user-created tracks and trails. Over time, the condition of many heritage resources would degrade as a result of motorized recreation.

Alternative 2 – Proposed Action

Inventory data, based on the results of archaeological surveys, indicate 22 heritage resource sites within the project Area of Potential Effects (APE)[5], which includes all OHV decision roads, trails, and staging areas proposed under Alternative 2. The impacts to heritage resources for each proposed OHV system are discussed below.

LaDee Flats Proposed OHV System

Archaeological site 665NA135, a severely damaged pre-contact site, was previously evaluated and determined not eligible to the National Register of Historic Places (NRHP) due to integrity loss.

Sites 663EA164A, 665NA169 and 665NA175 also appear to lack sufficient integrity to meet the NRHP significance criteria, but have not been formally evaluated. Protective measures would not be applied to these sites.

Archaeological site 665EA13 is the location of an historic period logging camp that is likely eligible to the NRHP. While adjacent to a proposed OHV route, relatively dense vegetation provides protective screening of surface features and artifacts. Because the dense vegetation protects this site, no additional protective measures would be necessary.

Archaeological sites 665NA91, 665NA145 and 665NA146 are immediately adjacent to proposed OHV routes. None have been formally evaluated, but these sites may have the potential to meet the NRHP criteria. Field investigations at each site found that subsurface archaeological deposits did not extend into roadbeds proposed for OHV use. Archaeological values would not be impacted provided that OHV use is confined to designated routes.

Site 665EA226, the Abbot Road, is a historic truck trail road built by the Civilian Conservation Corps (CCC). Although the road is unimproved for much of its length, retaining historic integrity, native surfacing is very compact. The road has not been formally evaluated, but is likely eligible to the NRHP because of its association with the New Deal work programs of the Roosevelt Administration. Motorized recreational use would likely have little to no effect to the historic values or integrity of the road, given the compact surfacing evident over most of the route.

Peavine Proposed OHV System

Archaeological sites 663EA23 and 663EA220 are the locations of former fire lookouts and do not appear to be eligible to the NRHP due to loss of integrity. No protective measures would be necessary.

Pre-contact site 663NA215 has not been formally evaluated, but may meet the NRHP significance criteria depending on the character and content of subsurface deposits. A proposed OHV route truncates the site, but field investigations indicate that crushed rock surfacing is of sufficient depth to protect the site deposits.

Site 663EA222 is an historic trail, previously truncated by Forest Service system roads now proposed as OHV routes under Alternative 2. As a historic resource, it has not been formally evaluated for NRHP significance. Motorized recreational use of the adjacent roads would not affect adjacent intact segments of the historic trail, currently obscured by dense roadside vegetation.

5 Title 36, Code of Federal Regulations, Part 800.2, defines APE as "…the geographic area or areas within which an undertaking may cause changes in the character or use of historic properties…"

Segments of the historic Skyline Road, linear site 663EA313, would be utilized as portions of proposed OHV routes. These portions of the historic road have not been formally evaluated for NRHP significance, but have likely lost historic integrity due to realignment and modification in the 1960s. Because of the alterations, motorized recreational use has little to no potential to affect historic values or integrity.

Archaeological site 663NA319 is a large pre-contact site with intact subsurface cultural deposits and evidence of multiple episodes of use through time. Proposed new trail construction under Alternative 2 would result in an adverse effect to the site, primarily from cut and fill necessary to achieve grade from Forest Service Road 48. To mitigate potential adverse effects, archaeological data recovery investigations are proposed for the area of probable direct impacts. Data recovery methods would follow an approved plan developed in consultation with the State Archaeologist and the Confederated Tribes of Warm Springs.

McCubbins Gulch Proposed OHV System

Two heritage resource sites were identified within proposed OHV trails in this analysis area. Both have incurred damage as a result of soil disturbance and erosion from existing OHV use. Pre-contact site 662NA93 is a 3-acre lithic scatter with intact, low density subsurface cultural deposits, located within McCubbins Campground. The site has not been formally evaluated for NRHP significance. Recovered artifacts indicate use in the Early Archaic period. Under the Alternative 2 proposal, a proposed OHV route crosses the site. This is an existing road, but OHV use off the roadway and through the archaeological site has caused severe erosion problems (Caulk 1994). Further assessment of the site is necessary to determine NRHP eligibility status and appropriate application of project design criteria. If determined not eligible to the NRHP, no protective measures would be necessary.

Linear site 661EA259 is the historic Clear Creek irrigation ditch system, associated with post-contact settlement and agricultural development. A previous assessment indicated that the ditch system is likely eligible to the NRHP, but had suffered localized impacts from OHV use (Rampp et al. 1997). Other inspections of the ditch have revealed that the ditch continues to be utilized and maintained, and may not possess any characteristics or features making it eligible for inclusion on the NRHP. Under the Alternative 2 proposal, proposed OHV trails would cross the Clear Creek Ditch in two locations. These are existing OHV trails, not previously assessed for potential effects to the historic resource. Further assessment of the site is necessary to determine NRHP eligibility status and appropriate application of project design criteria. If determined not eligible to the NRHP, no protective measures would be necessary.

Rock Creek Proposed OHV System

Three heritage resource sites were identified within proposed OHV trails, and one, 661NA131, a large Early Archaic site, is within the Day Use Area. The latter has been determined eligible to the NRHP. Much of the site has been damaged by quarrying activity and subsequent recreational OHV use. Intact portions of the site were fenced in 2008 to protect archaeological resources from OHV damage, but site boundaries remain indefinite. Prior to project implementation, additional archaeological sampling would be necessary to establish the boundaries for site 661NA131 and determine if there is a need for additional protective fencing.

None of the other three appear to be eligible to the NRHP, but formal evaluations have not been done. Site 661IS39 is an isolated pre-contact lithic artifact found within a native surface road. Field investigations found no evidence of additional artifacts or cultural deposits at the location. Linear site 661EA149 is an historic Forest Service telephone line that has been truncated multiple times by several Forest Service roads to be proposed as OHV routes. The site is likely not eligible to the NRHP. Motorized recreational use of the existing roads would have no effect to historic values. The third site identified in the analysis area is the historic Gate Creek Irrigation Ditch. Proposed trail bridge construction under Alternative 2 has the potential to adversely affect historic values. However, the ditch system, including headgate features, was substantially modified in the 1950s, resulting in loss of historic integrity. Formal evaluation is needed to clarify significance status. If determined not eligible to the NRHP, no protective measures would be necessary.

Gibson Prairie Proposed OHV System

The historic North Section Line Trail, linear site 661EA340, is the only heritage resource site identified within the APE for the proposed Gibson Prairie OHV location. The trail has not been formally evaluated for historic significance. Proposed widening of the trail for use by Class III OHVs would affect historic values. Research suggests that historic associative values are lacking, and the trail probably does not meet the NRHP eligibility criteria. If demonstrated through formal evaluation, then no protective measures would be necessary.

Bear Creek Proposed OHV System

One post-contact heritage resource was identified within proposed OHV trails under Alternative 2. Linear Forest Service trail site 666EA30 is not likely eligible to the NRHP because historic associative values are lacking. The historic trail has not been formally evaluated. If formally determined not eligible, no protective measures would be necessary. Proposed OHV trails would truncate the trail in only a few locations, affecting only a small portion of the overall length.

Summary of Indirect and Direct Effects for Alternative 2

Implementation of Alternative 2 would involve a Forest Plan Amendment closing all of the Forest to OHV use except the proposed routes, significantly reducing ongoing effects to heritage resources. Under Alternative 2 – Proposed Action, formal NRHP eligibility determinations are required for five sites: 662NA93, 661EA259, the Gate Creek Irrigation Ditch (no site number), 661EA340, and 666EA30. With the exception of site 662NA93, it is likely that the remaining sites would be found ineligible for the NRHP, and no protective measures would be required. Additional investigation of site 662NA93 may also prove this site is also ineligible.

Site 661NA131 has been found to be eligible for inclusion in the NRHP, and would be protected with an exclusion fence (FW-615). Additional archaeological sampling is necessary to establish boundaries and assess the need for additional fencing. Data recovery would be required for site 663NA319 (FW-618, FW-619, FW-620, and FW-621).

Cumulative Effects for Alternative 2

Implementation of the No Whisky Plantation Thinning project included fall 2008 installation of boulder barriers to restrict OHV use in the LaDee OHV System area. This action may halt the ongoing OHV impacts that were previously documented at archaeological site 665NA135. Illegal trail construction in the Bear Creek OHV System area, documented in 2007, has the potential to affect pre-contact archaeological sites outside proposed routes. Other than these situations, there would be no cumulative effects to heritage resources, other than the natural processes that are already occurring.

Alternative 3

Inventory data, based on the results of archaeological surveys, indicate 25 heritage resource sites within OHV roads, trails, and staging areas proposed under Alternative 3.

LaDee Flats Proposed OHV System

The same assessment provided for Alternative 2, above, applies to Alternative 3.

Peavine Proposed OHV System

Two of the sites described under Alternative 2, are within the APE of the Alternative 3 proposal. These include pre-contact site 663NA215 and the post-contact fire lookout site, 663EA23. The pre-contact site is protected from possible disturbance by a sufficient layer of crushed rock surfacing. The fire lookout site does not appear to meet the NRHP significance criteria, and would not require protection once formal evaluation is complete.

Graham Pass Proposed OHV System

A total of seven heritage resource sites were identified within the APE for the proposed Graham Pass OHV location. Six are pre-contact archaeological sites and one is the location of a former Forest Service fire lookout. None of the sites have been formally evaluated for NRHP significance and eligibility. Site 663EA23, the former fire lookout location, is likely not eligible to the NRHP due to overall integrity loss (the structure has been destroyed). Once the site has been formally evaluated, protective measures would not be necessary. The pre-contact sites, however, may be eligible. Additional field investigations are necessary to determine the boundaries of these sites prior to determining the appropriate application of design criteria. The preferred treatment is protection in place using site hardening or armoring methods to prevent further disturbance and erosion of archaeological deposits.

McCubbins Gulch Proposed OHV System

The same assessment provided under Alternative 2, above, applies under Alternative 3, with the addition of post-contact linear resource 662EA13, the Oak Grove Wagon Road. Forest Road 4310 has been built over a portion of the historic wagon road, and would be utilized for motorized recreation as a proposed route. The historic integrity of this portion of the wagon road has been lost, and no protective measures would be necessary. A proposed bridge crossing over the historic Clear Creek ditch 661EA259 would prevent further damage to the ditch, and would not adversely impact the site.

Rock Creek Proposed OHV System

The same assessment provided under Alternative 2, above, applies under Alternative 3, with the exception of the possible effects to the Gate Creek Ditch. No bridge crossing of the historic ditch is proposed under Alternative 3.

Gibson Prairie Proposed OHV System

The same assessment provided for Alternative 2, above, applies to Alternative 3.

Bear Creek Proposed OHV System

The same assessment provided for Alternative 2, above, applies to Alternative 3.

Mt. Defiance Proposed OHV System

No heritage resources were identified within the APE for this proposed OHV location.

Summary of Direct and Indirect Effects for Alternative 3

Implementation of Alternative 3 would involve a Forest Plan Amendment closing all of the Forest to OHV use except the proposed routes, significantly reducing ongoing effects to heritage resources. Under Alternative 3, formal NRHP eligibility determinations are required for sites 663EA23, six pre-contact sites within the Graham Pass OHV area, 662NA93, 661EA259, the Gate Creek Irrigation Ditch (no site number), 661EA340, and 666EA30. With the exception of the six pre-contact sites and site 662NA93, it is likely that the remaining sites would be found ineligible for the NRHP, and no protective measures would be required. Also, additional investigation of site 662NA93 may prove this site to be ineligible. The six pre-contact sites within the Graham Pass OHV area may be found eligible and protective measures would be required (FW-615, FW-616, and FW-617).

Site 661NA131 has been found to be eligible for inclusion in the NRHP, and has been protected by exclosure fencing. Additional archaeological sampling would be necessary to establish boundaries and assess the need for additional fencing.

Cumulative Effects for Alternative 3

Implementation of the No Whisky Plantation Thinning project included fall 2008 installation of boulder barriers to restrict OHV use in the LaDee OHV System area. This action may halt the ongoing OHV impacts that were previously documented at archaeological site 665NA135. As was noted under Alternative 2, illegal trail construction was documented in the Bear Creek OHV System area and has the potential to affect pre-contact archaeological sites outside proposed routes. Aside from these situations, there would be no cumulative effects to heritage resources, other than the natural processes that are already occurring.

Alternative 4

Inventory data, based on the results of archaeological surveys, indicate 10 heritage resource sites within OHV decision roads, trails, and staging areas proposed under Alternative 4.

LaDee Flats Proposed OHV System

Six of the nine heritage resources described under Alternative 2 are within the APE for proposed OHV roads and trails under Alternative 4. These include 665EA13, the historic logging camp, 663EA164A, the historic logging railroad system, and pre-contact archaeological sites 665NA91, 665NA135, 665NA169, and 665NA175. The same assessment provided for these sites under Alternative 2, above, applies to Alternative 4.

McCubbins Gulch Proposed OHV System

The same assessment provided under Alternative 2, above, applies under Alternative 4.

Rock Creek Proposed OHV System

The same assessment provided under Alternative 3, above, applies under Alternative 4.

Summary of Direct and Indirect Effects for Alternative 4

Implementation of Alternative 4 would involve a Forest Plan Amendment closing all of the Forest to OHV use except the designated routes, significantly reducing ongoing effects to heritage resources. Under Alternative 4, formal NRHP eligibility determinations are required for sites 662NA93, 661EA259, the Gate Creek Irrigation Ditch (no site number), and 666EA30. With the exception of site 662NA93, it is likely that the remaining sites would be found ineligible for the NRHP, and no protective measures would be required. Also, additional investigation of site 662NA93 may prove this site to be ineligible. Site 661NA131 has been found to be eligible for inclusion in the NRHP, and has been protected by exclosure fencing.

Cumulative Effects for Alternative 4

Implementation of the No Whisky Plantation Thinning project included fall 2008 installation of boulder barriers to restrict OHV use in the LaDee OHV System area. This action may halt the ongoing OHV impacts that were previously documented at archaeological site 665NA135. Aside from this case, there would be no cumulative effects to heritage resources, other than the natural processes that are already occurring.

3.8.3. Incomplete and Unavailable Information

Heritage Resource Surveys (inventories) were not completed for the previously unsurveyed lands that would remain open to OHV use under Alternative 1. This includes an estimated 30-40,000 acres likely containing many as yet unidentified pre-contact and historic period resources. A survey of this scale would require several years of planning and execution and a very large budget – one well beyond the allocations for the present project. Field surveys for each of the OHV Systems considered under Alternatives 2-4 were largely complete by December 2008. Surveys for some proposed OHV routes in the Rock Creek OHV System are lacking. These consist mainly of short segments connecting existing roads. Analysis relied on previous survey data for several overlapping projects, but there are a few segments proposed under Alternative 3 that will require archaeological survey during 2009. Additionally, subsurface sampling and site boundary definition will be necessary for six pre-contact archaeological sites in the Graham Pass OHV System area. Fieldwork to collect additional data is scheduled for the summer of 2009. Data will be applied to the development of specific protection measures, as indicated by the project design criteria. Heritage Resource Survey Reports for each proposed OHV System will be completed by July 2009 for submission to Tribes and SHPO.

3.9. Law Enforcement

3.9.1. Existing Condition

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 or 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 and other federal crimes and investigations that are more serious in nature. LEOs also gain compliance from offenders through warnings and education. Mt. Hood National 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.

As of calendar year 2008, the Forest had nine FPOs and six LEOs. All but one FPO on the Forest has no direct duties in recreation. They fall under other fields, such as timber, forest products, engineering and fire. Due to the small number of LEOs and recreation technicians with FPO status on the Forest, compliance and enforcement is limited. Out of the six LEOs on the Forest, one is a reserve LEO that has primary duties with regard to fee compliance. In 2009, the number of LEOs would decrease by two, but the Law Enforcement and Investigations (LE&I) staff on the Forest is planning to fill those positions pending budget allocations. The start up time for LEOs hired to fill the two positions would depend on whether the LEOs are experienced natural resource officers or less experienced officers making their initial entry into natural resource law enforcement. Experienced natural resource officers can hit the ground running with minimal training time whereas less experienced officers would require a substantial amount of training, which in turn would delay their start up time.

Although the FPO and LEO presence on the Forest is limited, the Forest does receive help from four surrounding counties which have jurisdictional boundaries within the Forest. Three of the four counties provide one deputy to work on the Forest starting Memorial Day weekend through Labor Day weekend each year. One county provides one full-time deputy and one part-time deputy during the same time frame. Although the counties help augment law enforcement presence on the Forest, they mainly provide response for those violations involving people crimes and personal property crimes. LEOs in turn provide response for those crimes committed against the government.

Currently, both counties on the eastside of the Forest receive state OHV grant funding. These counties now provide OHV patrol resources on the eastside of the Forest. A third county is looking at the same type of funding to provide OHV patrol on the westside of the Forest. This grant funding provides an opportunity for collaboration between the Forest's LE&I staff and the county Sheriff's Offices.

3.9.2. Effects Analysis

Direct, Indirect and Cumulative Effects for Alternative 1 – No Action Alternative

Currently, the Forest has an "Open Unless Posted Closed" implied policy for motor vehicle use on the Forest. This makes approximately 2,463 miles of gravel Forest Service collector, native surface and improved native surface roads available for OHV travel by State law. It also allows for more access to other areas on the Forest for cross-country travel. Because of the many miles and areas for OHVs to travel, the end result is typically resource damage, OHV rider safety concerns and unauthorized OHV trail building and maintenance. The effects also include the damage to government property with regard to road and area signs prohibiting OHV use.

Under the No Action Alternative, LEOs and FPOs are reliant on signs prohibiting off-road use. Because most of the closure areas are written under a Subpart B Forest Order (see Section 1.6 and Table 1.3), they must meet certain posting guidelines and requirements so that they can be readily available for the public to read in the affected areas. It is in these areas that signs are torn down by Forest visitors who do not want to comply with the prohibitions. This in turn leaves LEOs and FPOs unable to enforce closures when they observe someone in a closure area and the prohibition signs have been torn down.

The No Action Alternative also allows for Class I, II and III OHVs to travel cross-country, which incurs collateral damage to the natural resources and the commission of crimes associated with that type of activity. These crimes involve the cutting down of trees, clearing of ground vegetation, and soil disturbance for unauthorized trail building. Because cross-country travel is allowed throughout much of the Forest, this type of activity is increasingly difficult for LEOs and FPOs to address due to the vastness of the affected area and understaffing.

The No Action Alternative would continue to allow for the continued OHV activity known as mudding or mud bogging. Mudding/mud bogging takes place in areas where rain has collected or snow has melted over the winter. Mud holes are then created by OHVs mudding or mud bogging within those holes. Mudding/mud bogging creates a resource concern due to the degradation of soil, wildlife habitat concerns and prevention of new plant growth. The No Action Alternative would continue to allow Class I, II and III OHVs access to those areas of the Forest that cannot rehabilitate due to resource damage caused by OHVs. This again affects the LEO and FPO enforcement and education efforts due the vastness of the affected area that currently lack enforcement presence due to understaffing.

The No Action Alternative would continue to allow access to Class I, II and III OHVs on 2,463 miles of gravel Forest Service collector, native surface and improved native surface roads that are shared with passenger and commercial vehicles Forestwide. This condition would continue to place OHV enthusiasts at risk for collision with passenger and commercial vehicles, which are commonplace on gravel and native surface roads throughout the Forest.

No Action Alternative Summary

The No Action Alternative would continue to propagate the existing OHV related issues facing the Forest today. This alternative could potentially continue to be a compliance and enforcement hardship for LE&I staff and FPOs due to understaffing. Under the No Action Alternative, the Forest would continue to address the current OHV issues that involve resource damage, illegal trail building and conflicts between passenger/commercial vehicles versus Class I, II and III OHVs on a Forestwide basis.

Potential for these issues to increase could also be attributed to an increase in OHV recreation due to the urban growth boundary that grows closer to the Forest. The growth of large cities in neighboring states such as Vancouver, Washington could also increase our OHV visitor use on the Forest. LEOs on the Forest have first-hand knowledge of this based on field contacts with OHV enthusiasts from Washington state.

Ultimately, the No Action Alternative would burden law enforcement compliance efforts Forestwide. At this time the Forest is not fully staffed to address the activity that currently takes place under the No Action Alternative and the management of enforcement would continue to be hindered.

Direct, Indirect and Cumulative Effects for Action Alternatives

Note: The Action Alternatives mentioned in the Direct, Indirect and Cumulative Effects include the Proposed Action and its alternatives pending whatever selection is made by the Forest Supervisor. Also, those Action Alternatives that are not specifically addressed in this section are not by oversight, but due to the lesser degree of enforcement effects on the Forest.

The All Action Alternatives include the following: Graham Pass Alternative 3, Bear Creek Alternatives 2 and 3, Gibson Prairie Alternatives 2 and 3, McCubbins Alternatives 2, 3 and 4, Peavine Alternatives 2 and 3, LaDee Alternatives 2, 3 and 4, Mt. Defiance Alternative 3, and Rock Creek Alternatives 2, 3 and 4.

The Action Alternatives would offer proposed OHV roads and trails and one small OHV area throughout the Forest. These alternatives would amend the Forest Plan and change the current "Open unless Posted Closed" implied policy to "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 area are closed to OHV use without the need of posting area closures. This in itself helps address the current property damage that the Forest incurs when posting area closures. The fact that only open roads, trails, and area would be posted could potentially make Forest visitors less inclined to tear down signs.

Under the Action Alternatives the majority of 2,463 miles of gravel Forest Service collector, native surface and improved native surface roads would be closed outside of the proposed OHV roads, trails, and area. This change would dramatically lessen the potential for accidents between passenger/commercial vehicles versus Class I, II and III OHVs (see the Transportation section for more discussion on motor vehicle mixed-use). The open areas that are currently affected by OHV cross-country travel should also lessen. There could be a drop in resource damage, soil disturbance, and unauthorized trail building in the foreseeable future due to the prohibited access opportunities. 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.

Although the Action Alternatives would create several proposed OHV systems, it is still more manageable for enforcement purposes as opposed to currently providing Forestwide law enforcement presence under the No Action Alternative. This idea relies heavily on the public taking advantage of the diverse OHV opportunities that would be afforded to them under the Action Alternatives. It would also rely on the public having some time to become aware and accustomed to a "Closed unless Posted Open" policy. The public would also gain knowledge of the new OHV rules and opportunities through information provided to them by LEOs, FPOs, Cooperating Sheriff's Office Deputies and OHV volunteers during field contacts.

Bear Creek Alternatives 2 and 3 would provide single track riding experience for those OHV enthusiasts that operate Class III OHVs. Currently, LE&I on the Forest do not possess Class III OHVs to provide any trail patrol presence for a single track OHV trail. Additionally, Forest Service policy requires employees to possess a state motorcycle endorsement in order to operate Class III OHVs for work purposes. The lack of Class III OHVs can be resolved by requesting the needed patrol equipment through the budget allocation process or OHV grant programs. This equipment can then be used by LEOs and FPOs to provide patrol presence on trails. This would allow more field presence for LEOs and FPOs to address violations such as shortcuts on trail switchbacks, helmet law violations and other related Class III OHV enforcement and safety concerns. The required state motorcycle endorsement would be addressed by each department that has a need for employees to perform that type of patrol work.

Rock Creek Alternative 3 provides for a mixed-use road that allows Class I and III OHVs into Badger Lake, which is surrounded by the Badger Creek Wilderness area. A portion of Forest Road 4860 runs along the westside of the Badger Creek Wilderness boundary and Forest Road 4860-140 spur is a keyhole road within the Badger Creek Wilderness leading into Badger Lake. Currently, there are signs of OHV use into the Badger Creek Wilderness boundary from both roads. Designating these roads for OHV use could continue OHV trespass into the wilderness area. FPOs cannot follow or pursue those trespassing beyond the wilderness boundary in their patrol vehicle or patrol OHV without prior approval from the Forest Supervisor. Following or pursuing OHVs beyond the wilderness boundary would have to be done on foot by FPOs, which in turn creates safety concerns. LEOs would pursue those individuals utilizing their Federal Officer Arrest Authority granted by the State of Oregon which FPOs do not have. The same action would be taken on any proposed OHV roads and trails that border other wilderness areas. These areas include Mt. Defiance Alternative 3 and LaDee Alternatives 2 and 3.

Rock Creek Alternative 3 does not provide access to Class II OHVs on mixed-use roads identified in the alternative as gravel Forest Service collector roads and native surface roads. These roads are considered wide enough that the effect a Class II OHV would cause on road degeneration is no more than the passenger vehicles currently allowed. The exclusion of Class II OHVs on gravel Forest Service collector roads and native surface roads in this alternative would make it hard for LEOs and FPOs to explain the prohibition considering that they would have minimal affect on the road. Unless there is a legitimate reason for excluding Class II OHVs from this alternative, management through enforcement and compliance would be difficult to implement.

Staging Area Impacts for Law Enforcement

The staging areas for those Action Alternatives that afford this service could pose a compliance issue as they are only for day use and exclude overnight use. Since staging areas are first come first serve, OHV systems that offer staging could experience visitors roping off sections of the staging area to reserve a spot. The Forest currently experiences this activity in and around the dispersed areas of the McCubbins Gulch and Rock Creek OHV areas. Reserving spots like this have taken place days prior to popular holiday weekends. This type of behavior would undoubtedly create a compliance issue that usually involves large groups of visitors that are frustrated and angry. Dealing with large groups, especially angered groups, is the type of contact that would be deemed unsafe for an FPO to handle and would require the assistance of an LEO.

Staging areas have the potential to create party spots due to their remoteness and amenities such as tables, trash cans and restroom facilities that may be offered. Historically, popular party spots in other parts of the Forest have experienced litter and vandalism. Existing popular party spots are typically located in gravel pits. The proposed list of staging areas includes gravel pits, log landings, quarries and gravel storage areas. This may create attention to a staging area as a new party spot depending on what facilities are proposed for implementation. Although any new recreation facility has a potential for misuse, this potential should not discourage the Forest from developing a facility that would help manage and facilitate the OHV program. The probability of party spots is only mentioned here to bring to light the potential for problems in these areas.

Staging areas could also offer a centralized area for LEOs and Forest FPOs to provide enforcement and compliance emphasis with regard to CFRs and state laws. They also provide a centralized area where equipment checks could be conducted during events.

Action Alternatives Summary

Depending on what Action Alternative is chosen, the Action Alternatives afford a more sustainable OHV program, which allows for a better managed OHV law enforcement program on the Forest. Engineering, education and enforcement is more manageable with the Action Alternatives since it does not allow for Forestwide OHV travel. It also addresses the Class I, II and III OHVs versus passenger/commercial vehicle conflicts on current mixed-use roads.

The development of sustainable OHV roads and trails that are designed for the particular use of an OHV should help reduce the impacts of resource damage and illegal trail building. The OHV systems would concentrate OHV use in locations that are developed for that purpose and theoretically make patrol operations more focused in those areas.

Although the potential for continued OHV proliferation outside the proposed OHV roads, trails, and area would still be an enforcement issue, the detection and enforcement of the violation would be easier and clearer. This is because all areas outside the proposed OHV roads, trails, and area would be closed to OHV travel. Overall, the Action Alternatives offer law enforcement the opportunity to make better cases against willful perpetrators operating OHVs in closed areas and building/maintaining illegal OHV trails as stated in paragraph three of the “Direct, Indirect and Cumulative Effects for All Action Alternatives”.

3.10. Fire Suppression

This analysis is based on the information found in the Fuels Specialist Report for this project, which is in the project record located at the Forest Headquarters Office in Sandy, Oregon.

3.10.1. Affected Environment

Currently, the Mt. Hood National Forest is using the past 28 years of collected data as the historical basis for its current fire management planning. This process, known as Fire Planning Analysis (FPA), uses weather and fire starts (location, cause, and size) to determine the best funding and utilization of resources. The FPA program uses Fire Management Units (FMU) to designate specific types of fires, fuels, and conditions for the fire planning process. For this analysis, the Forest Service used the FMUs rather than the traditional district boundaries; this also matches the current Forest fire dispatch blocks, currently in use for Initial Attack (IA) resource allocation. The proposed OHV systems have been further defined to analyze the fire starts within the smaller areas of the OHV roads and trails.

The primary issue for fire suppression operations is the closure of roads, or the change of road sizes to create trails. The suppression modules (Engines) used for IA, over the years, has become larger to accommodate larger crews, equipment, or both. As such, closing of roads or smaller access trails limits the ability of the IA resources to respond efficiently. The Forest does not have the use of mechanized equipment (e.g., dozers, skidders, and excavators) on a day to day basis for IA, and would have to order up this equipment to open roads or widen access to a fire start. As can be seen from the Fire Behavior table below (Table 3-108), most of the 97th percentile weather conditions (and part of the 90th percentile), preclude the use of handcrews in making direct attack on an established fire. Direct attack by handcrews is a suppression tactic used when flame lengths are less than four feet, as greater than this height, the radiant heat increases the distance that crews have to work away from the flames to be safe. Typically, only a mechanized, direct attack occurs between flame lengths of four to eight feet, and only indirect attack strategies are employed when flame lengths exceed eight feet. The only exception to this is in the treated areas of the eastside FMU, in the fuel model 9 areas, which are typical of the Ponderosa Pine/White Oak vegetation types (especially those areas either previously treated, currently being treated, or will be treated in the near future by various hazardous fuels treatment projects).

Table 3-108. Fire behavior for each representative weather station and OHV system. Fuel Model 10 was used for all the OHV systems; included Fuel Model 9 for lower Pine/Oak locations of the Rock Creek and McCubbins Gulch proposed OHV Systems for comparison. Information in bold font denotes Flame Length significantly exceeding 4 ft in height; only the Fuel Model 9 keeps Flame Length at or below 4 ft, even in the worse case scenario.

Station Name (Number)	Redbox (350718)		Wanderer's Peak (350726)		Blue Ridge (350811)		Wamic Mill (350913)		Wamic Mill (350913)		Pollywog (350912)	
OHV System	**Peavine**		**LaDee Flats**		**Bear Creek**		**McCubbins Gulch and Rock Creek**		**McCubbins Gulch and Rock Creek**		**Gibson Prairie**	
Percentile Range	**90th**	**97th**	**90th**	**97th**	**90th**	**97th**	**90th**	**97th**	**90th**	**97th**	**90th**	**97th**
Windspeed, 20'	8	9	8	14	20	24	9	12	9	12	13	18
Eye Level wind, Adjusted by .3	2.4	2.7	2.4	4.2	6	7.2	2.7	3.6	2.7	3.6	3.9	5.4
Ave. Slope used	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%
Outputs												
Effective Windspeed, Eyelevel	3.4	3.7	3.4	5	6.7	7.9	4.7	6.1	4.6	5.9	3.7	4.5
Rate of Spread, Ch/Hr.	5.6	7.2	5.4	11.0	14.4	20.7	11.5	17.9	9.2	15.6	8.1	11.8
Flame Length, Feet	4.4	**5.1**	4.2	**6.2**	**6.7**	**8.1**	**6.2**	**7.9**	3.2	4.2	**5.3**	**6.5**
Size in Acres												
Size after 1 hour	1.6	2.5	1.5	4.7	6.5	12.0	5.3	10.8	3.6	8.4	3.1	5.9
Size after 2 hours	6.3	10.0	5.9	18.7	26.1	48.0	21.2	43.2	14.1	33.5	12.4	23.4
Size after 3 hours	14.3	22.5	13.3	42.0	58.8	108.0	47.7	97.2	31.6	75.3	27.9	52.7
Size after 4 hours	25.4	40.0	23.6	74.4	104.5	192.0	84.7	172.7	56.3	133.9	49.7	93.6
Fuel Model Used - NFFL	10		10		10		10		9		10	

Delays in suppression operations increase fire size, which has a corresponding increase in fire cost. Small fires in remote locations, or logistically difficult areas to support, have increased fire costs when access is limited. A recent example is the Badger Fire (2008) on the Barlow Ranger District. Final size was only 29 acres, but the entire fire was within the Badger Creek Wilderness (southern arm), with a nearby Wildland Urban Interface (as defined in the Wasco County Wildfire Protection Plan). There was no option to manage for resource benefit (limited suppression, monitoring, confine strategy), due to the proximity of the Sportsman's Park WUI within a half mile of the fire. In the small area of wilderness the fire could be contained within, the possible escape from the wilderness boundary could threaten managed areas of the Forest (such as big game winter range and calving habitat and recreation sites) and state protected lands to the east. Suppression costs were approximately $182,000 (or $6,275/acre). Larger fires (over 100 acres), can cost up to $1,000,000 in the first four plus hours depending on location, resources requested, and values at risk.

If an Incident Management Team is requested, these costs significantly increase (depending on team type) to anywhere from $500,000 to $1,000,000 per day. Recent examples are the Blister Fire (2006) which cost $5.5 million for 790 acres, Blue Grass Fire (part of the Mt. Hood Complex, 2006) at over $10 million for 1850 acres, and the Ball Point Fire (2007) at $2.8 million for 1237 acres. All three fires were either in wilderness or areas where road systems had been decommissioned and or removed.

Fire History on Mt. Hood National Forest – 1980 through 2007

The Forest averages about 57 fires per year, of which 17 (30%) are lightning caused and 40 (70%) are human caused. The total acres from these starts are almost the opposite, with lightning fires accounting for 4952 (62%) acres, and the human caused fires accounting for 2979 (38%) acres. Since 2006, there have been several large fires on the Forest that were managed by Incident Management Teams, and most of these fires have been in either wilderness or areas where road access has been limited. All of these Class E or larger fires (see Table 3-106 for the acres of Fire Size Class), such as the Mt. Hood Complex (2006), Blister (2006), Ball Point (2007), Lake Lenore (2008), and Gnarl (2008) Fires, have been lightning caused. The most recent large human caused fire was the 25 acre Clackamas Lake Fire (2006). The 2008 fires have not been added into the fire occurrence data base at this time, and thus are not accounted for in this fire history analysis.

Table 3-109. Fire size class and corresponding acres.

Fire Size Class	Size Class Acres
A	> .25 acres
B	.26 to 9.9 acres
C	10 to 99.9 acres
D	100 to 299.9 acres
E	300 to 999.9 acres
F	1000 to 4999.9 acres
G	5000+ acres

There is no specific category for OHV as a fire occurrence category. Most of the human caused fires fall into two main categories: smoking and campfire. There is another category that makes up about 12% of the human caused starts, but they are undetermined as to a specific cause. These are listed under the miscellaneous category, and are generally listed in this category when no specific cause can be determined (but are definitely of human origin) from an investigation of the fire origin area. The equipment category typically refers to fire starts from mechanical operations of some form (e.g., vegetation removal or treatment, and road construction). This category does not include OHV starts; currently there are no recorded fire starts in the FireStat Database specifically related to an OHV caused ignition. There are no statistical categories for OHVs in the Forest Service Handbook 5109.14, Individual Wildland Fire Report, filed for each statistical fire start on the Forest, which is the official document used to report each start. Table 3-110 shows the ignition and statistical causes of fires on the Forest for the past 28 years.

Table 3-110. Ignition and statistical causes on the Mt. Hood NF from 1980 to 2007.

FMU ID	Lightning	Equipment	Smoking	Campfire	Debris Burn	Railroad	Incendiary	Children	Miscellaneous	Grand Total
Eastside	115 (27%)	12 (3%)	70 (16%)	145 (34%)	14 (3%)	0 (0%)	11 (3%)	4 (1%)	57 (13%)	428
Clackamas River	223 (30%)	15 (2%)	98 (13%)	268 (36%)	16 (2%)	0 (0%)	30 (4%)	5 (1%)	85 (12%)	740
Hwy 26	20 (15%)	1 (1%)	15 (11%)	52 (38%)	2 (2%)	1 (1%)	12 (9%)	0 (0%)	33 (24%)	136
Hood River	35 (26%)	5 (4%)	22 (16%)	51 (38%)	5 (4%)	0 (0%)	2 (2%)	0 (0%)	16 (12%)	136
Wilderness	83 (54%)	0 (0%)	10 (7%)	52 (34%)	0 (0%)	0 (0%)	1 (1%)	0 (0%)	8 (5%)	154
Total	476 (30%)	33 (2%)	215 (14%)	568 (36%)	37 (2%)	1 (0.1%)	56 (4%)	9 (0.6%)	199 (13%)	1594

Ignitions from OHVs

As per state regulations, all OHVs and other small engine powered vehicles or equipment are required to have and maintain spark arrestors, or they are in violation of State law, and the operator can be fined or held liable for damage caused by the OHV. As stated above, the Forest does not maintain a specific category of ignition starts from OHVs.

From a recent study in Albert, Canada (2002), the three causes of all-terrain vehicles (ATVs) (study was specific to ATVs only and not OHVs in general) caused fires were solenoids on winches, hot exhaust systems and parts, and sparks from the exhaust system. The first was usually right after operation of the winch, and the third cause was mitigated by properly installed and working spark arrestors. The study also had a similar issue with lack of specific causes, either from the solenoids, material combusting on the exhaust, or sparks from the exhaust (Advantage, Vol. 3, No. 44, October 2002). A follow up study on fire ignition potential in 2004 concluded that the exhaust systems of ATVs had the potential to be susceptible to certain types of fuels accumulating on them (in the study this was grass and a muskeg "muck"), drying out the fuel, and igniting accumulated material. The potential then rested on whether the fuel bed was receptive to the ignition source (the dried, smoldering fine fuels) falling to the ground, and then igniting wildland surface fuels. Due to the variability in the areas of the study, and the conditions of the fuels, there were no definitive answers to the number of potential starts, just that they could occur (Advantage, Vol. 5, No. 8, February, 2004).

Clackamas FMU (Peavine, LaDee Flats, and Graham Pass Proposed OHV Systems)

The Clackamas FMU has a higher number of human caused starts than the other FMUs, but there is about an even split on the acres (46% lightning, 52% human). The land base of the FMU is about 39% of the Mt. Hood NF, and has some of the larger recreation draws during the normal fire season. In the past 28 years, there have been 223 lightning and 512 human caused fires; most of the human caused fires resulted from campfire and smoking cause class of fire start (almost 50% of the human caused fires are in these two categories).

On a per acre basis, the Clackamas FMU has about 1.8 fires per every 1000 acres within the FMU over the past 28 years. The proposed OHV routes and fire starts within each analysis area are described below.

Peavine Proposed OHV System

The area analyzed for fire ignitions is defined by the Forest boundary with the Warm Springs Reservation (WSR) to the east, the bottom of Range 7S to the south; the west edge of Range 8E, and to the north in Township 6S, sections 13-18, does not include the small area north of Township 7S and east into Range 8.5E. This is the only proposed OHV system under consideration that has higher lightning (62%) caused fires than human caused fires (38%). Of the human caused fires, the highest percentage is from campfires, with the second highest cause being smoking. Equipment only accounts for 2.9% of the human caused fires in the past 28 years. This also correlates with the fire sizes as well; 73% (161 acres) of the fire acres in the OHV analysis area are from lightning caused fires, and 27% (57 acres) are from human caused ignitions.

LaDee Flats Proposed OHV System

The area analyzed for fire ignitions is defined by the forest boundary to the west and northwest (range 5E), north to the township 4S line break with township 3S in range 6E, to the south at the bottom of township 4S with the 5S line break in range 6E, then east along the Salmon-Huckleberry Wilderness in range 7E. The LaDee analysis area has had only five (11%) lightning fires in the past 28 years, compared to 42 (89%) human caused fires in the same period. The major source of the human caused fire starts is from campfires (16 starts, 34%), smoking (5 starts, 11%), and incendiary (e.g., arson, fireworks, and shooting) (8 starts, 17%). There were also 11 starts (23%) that are undetermined, other than human caused. Equipment caused fires only account for 4.3% of the fires in the analysis area (twp starts in 28 years). Within this timeframe, the human caused fires also account for 99% of the acres (120 acres), as compared to the 0.9 acres from lightning.

Graham Pass Proposed OHV System

The area analyzed for fire ignitions is defined by the area in Townships 7S, 8S, and 9S, and Range 7E to the Forest boundary in Township 9S. The Graham Pass analysis area has had 27 (46%) lightning fires in the past 28 years, compared to 32 (54%) human caused fires in the same period. The major source of the human caused fire starts is from campfires (10 starts, 17%), smoking (6 starts, 10%), and equipment and incendiary tied at (4 starts each, or 7% in each category). There were also five starts (9%) that are undetermined, other than human caused. Within this timeframe, the human caused fires also account for 53% of the acres (131 acres), as compared to the 47% of the acres (115 acres) from lightning.

The Graham Pass location has many roads for access, but is typically inaccessible for a good portion of the year due to snow or other conditions. The large human caused fires have been all under 100 acres (in fact the four Class C fires account for 120 of the 130 acres), and they all occurred prior to 1991. The last human caused fire was in 2007 for 0.1 acres. Lightning has occurred sporadically since 1980, with the last lightning caused fires in 2003. The largest is a 101 acre fire in 1992, accounting for 88% of the acres caused by lightning fires. This analysis area has a higher moisture content than the other proposed locations, which has most likely contributed to the lower ignitions overall and a reduced acreage in both human and lightning caused fires.

Eastside FMU (McCubbins, Rock Creek, Gibson Prairie OHV Systems)

The Eastside FMU has three of the proposed OHV systems within the FMU designation, and one of the systems (McCubbins Gulch) already has designated OHV routes. The Eastside FMU is approximately 19% of the acres on the Forest, being the second largest FMU in acres. The FMU has a slightly higher fire occurrence per acre than the Clackamas FMU with almost half the acres. Within the Eastside FMU, the past 28 years have seen 115 lightning and 313 human caused fires; most of the human caused fires are in the campfire and smoking cause class (215 of 313 of the human caused fires fall into these two categories or almost 69% of the human caused fires are in these two categories).

On a per acre basis, the Eastside FMU has about 2.1 fires per every 1000 acres within the FMU over the past 28 years. Below, the specific OHV analysis areas are analyzed for fire starts within the boundaries described below.

McCubbins Proposed OHV System

The area analyzed for fire ignitions is defined by the boundary with the Warm Springs Indian Reservation to the south, private land to the east at the Forest boundary, west at Forest Service Road 43 to Oregon State Highway 26 to the Warm Springs Reservation boundary, and north at the Township 4S-5S line, only to the White River (not including ignitions north of the White River in Ranges 10E and 11E, but does include Ranges 9E, 10E, and 11E south of the White River).

The McCubbins Gulch existing and proposed OHV system is already a heavily used OHV location (currently the only designated OHV site on the Forest), and as such, is a fairly good local example of fire starts from an OHV designated site. Other activities also occur in the area, such as camping, hunting, and other outdoor activities. Over the past 28 years, there have been 34 fires within the analysis area, of which only four (12%) have been from lightning and 30 (88%) from human caused ignitions. The major source of the human caused fires is from campfires (14 start, 41%) and smoking (8 starts, 24%). There are also five miscellaneous caused fires (15%) that were determined to be human, but no specific cause of ignition could be identified. One fire in 2005, was most likely an OHV caused fire (point of origin was along a designated OHV route), but a fire investigation with Law Enforcement and Investigation personnel was unable to determine the exact cause so no specific link to an OHV was determined. Currently, 98% of the acres from fires are human caused (24.6 acres), compared to the 0.4 acres from lightning fires.

Rock Creek Proposed OHV System

The area analyzed for fire ignitions is defined by the Forest boundary to the east of the 48 Road, the Boulder Creek drainage to the west, and the Township 4S line, north at the 3S line break and 5S for the south line break. This analysis area includes the current OHV use area (not officially designated as an OHV area), the new proposed location to the west of the 4811 Road, and to the edge of the Badger Creek Wilderness.

The Rock Creek site is already a heavily used OHV location and dispersed camping area, generally in the proposed day use only area. Many years of use in this location have created OHV trails, and there are older Forest Service roads that cross the day use area due to past and current harvest activities, fuels treatments (past and present), and various dispersed camping for recreation, hunting, or other forest uses. The day use area is within the Sportsman Park Wildland Urban Interface (WUI) as identified in the Wasco County Wildfire Protection Plan and collaboration with the Sportsman Park Homeowners association (and others) on the Sportsman Park Fuels Reduction Project (2005). The fire analysis (over a smaller area) for the fuels treatment projects in 2005 showed that there had only been 14 fires over a 19 year period, within the proposed treatment area for the Sportsman Park Fuels Reduction (currently the proposed day use area), for less than 14 acres of damage to Forest Service managed lands (Sportsman Park Fuels Reduction, Categorical Exclusion, Fuels Report, 2005).

Over the past 28 years, there have been 60 fires, of which 28 (32%) have been lightning caused and 60 (68%) have been human caused. The major source of the human caused fires is from campfires (18 start, 21%), smoking (14 starts, 16%), and miscellaneous (19 starts, 22%). Human caused fires account for 94% of the fire acres (over 115 acres) within the analysis area, but most of those acres occurred prior to 2000, and in areas that have not been treated for fuels reduction. Many of the miscellaneous starts were recorded as such, as an exact determination of cause could not be established, either due to lack of investigation, private citizen help prior to arrival of initial attack resources, or local fire agencies suppression operations. One such incident occurred in 2006, a late evening discovery near the Rock Creek Campground; campers at the campsite attempted suppression operations, obliterating any fire cause evidence in the process before Forest Service initial attack resources arrived on scene.

Gibson Prairie Proposed OHV System

The area analyzed for fire ignitions is defined by the Forest boundary to the north at the Township 1N/1S line, east and west to the Forest boundary, and along The Dalles Watershed boundary to the south. The Gibson Prairie analysis area has had only two (14%) lightning fires in the past 28 years, compared to 14 (86%) human caused fires in the same period. The major source of the human caused fire starts is from incendiary (such as arson, fireworks, or shooting, (4 starts, 29%)), smoking (2 starts, 14%), and campfires (2 starts, 14%). There are also three starts (21%) that are undetermined, other than human caused. Equipment caused fires account for no fire starts in the analysis area. Over the past 28 years, human caused fires have accounted for almost 97% of the acres burned (almost 21 acres), compared to lightning caused fires at 0.3 acres within the same time frame.

Hood River FMU (Bear Creek and Mt Defiance Proposed OHV Systems)

The Hood River FMU has one of the proposed OHV systems within the FMU designation. The Hood River FMU is approximately 9% of the acres on the Forest, being the smallest FMU in acres. The FMU has a third highest fire occurrence per acre of the five FMUs with almost a quarter of the acres compared to the Clackamas FMU. Within the Hood River FMU, the past 28 years have seen 35 lightning and 101 human caused fires; most of the human caused fires are in the campfire and smoking cause class (73 of 101 (72%) of the human caused fires fall into these two categories).

On a per acre basis, the Hood River FMU has about 1.44 fires per every 1000 acres within the FMU over the past 28 years. Below, the specific OHV systems are analyzed for fire starts within the boundaries described below.

Bear Creek Proposed OHV System

The area analyzed for fire ignitions is defined by the boundary of Township 1S and Range 9E, excluding the private land the east and north, and the wilderness area south of the proposed OHV system. This analysis area includes Laurance Lake and the associated campground, where potential increased camping could occur due to public use of the proposed Bear Creek OHV system.

In the Bear Creek proposed OHV system there have been 60 fires within the analysis area, of which 15 (25%) have been from lightning and 45 (75%) from human caused ignitions. The major source of the human caused fires is from campfires (28 starts, 47%), smoking (6 starts, 10%), and miscellaneous (7 starts, 12%). This particular area, known as Red Hill, has the highest equipment caused starts (percentage wise) than any others, mainly due to more harvest activities in the past, as well as private land harvest operations interspersed adjacent to the area.

Over the past 28 years, the human caused fires have accounted for 82% (9.8 acres) of the fire acres, while lightning accounts for 18% or 2.2 acres. The last fire within the analysis area was in 2005 (lightning caused), and the last human caused fire was in 2002.

Mt Defiance Proposed OHV System

The area analyzed for fire ignitions is defined by the boundary of Township 2N and Range 9E, excluding the wilderness area to the west and north, and the lands outside the Forest boundary to the east and south of the proposed OHV system.

In the Mt. Defiance analysis area, there have been ten fires, of which two (20%) have been from lightning, and eight (80%) from human caused ignitions. The major source of the human caused fires is from campfires (five starts, 50%), incendiary (one start, 10%), debris burn (one start, 10%) and miscellaneous (one start, 10%).

Over the past 28 years, the human caused fires have accounted for 41% (1.1 acres) of the fire acres, while lightning accounts for 59% or 1.6 acres. The last lightning fire within the analysis area was in 2006 (one fire, for 0.6 acres), and the last human caused fire was in 2006 (two fires, for 0.4 acres total).

Summary of Existing Conditions for the Proposed OHV Systems

Current conditions show a general higher human caused fire start for all FMUs and the specific proposed OHV routes. However, larger fire acreage is generally, across the Forest, caused by lightning ignited fires. Human caused fires have been smaller, as the ignition points are closer to accessible areas for initial attack resources, thereby catching the ignitions when smaller, and thus having general lower cost. Over 70 percent of fires on the Forest are human caused, but account for only 38% of the acres each, whereas the lightning caused fires are only 30% of the ignitions, but account for 62% of the acres (a number which seems to be increasing if the past few years are any indicator of potential future events) (Table 3-111).

Many of the proposed OHV systems follow the ignition percentages, but within these proposed systems, the human caused fires do account for more of the acres affected by fire, as well as a higher ignition percentage in the human caused fires. The only location not showing the same trend is the Peavine proposed OHV system, which has a higher lightning caused occurrence than human.

Table 3-111. Total of Forestwide lightning and human caused fires from 1980 to 2007.

	Percentage of starts	Number of starts	Total Acres	Percent of total Acres
Forestwide Total Lightning Fires	30%	476	4952	62%
Forestwide Total Human Caused Fires	70%	1118	2979	38%
	100%	1594	7932	100%
	Average Starts/Yr.		**Average Acres/Yr.**	
Lightning Caused	17		177	
Human Caused	40		106	
Total Starts	57		283	

Table 3-112. Total of ignition causes and acres for each OHV system from 1980 to 2007.

Peavine OHV System		**Acres**	**% Acres**	**% Cause**
Total Lightning Fires	42	161	74%	63%
Total Human Caused Fires	26	57	26%	38%
Total Fires	68	218		
LaDee Flats OHV System		**Acres**	**% Acres**	**% Cause**
Total Lightning Fires	5	1	0.7%	11%
Total Human Caused Fires	42	120	99%	89%
Total Fires	47	121		
Graham Pass OHV System		**Acres**	**% Acres**	**% Cause**
Total Lightning Fires	27	115	47%	46%
Total Human Caused Fires	32	131	53%	54%
Total Fires	59	246		
McCubbins Gulch OHV System		**Acres**	**% Acres**	**% Cause**
Total Lightning Fires	4	0.4	2%	12%
Total Human Caused Fires	30	25	98%	88%
Total Fires	34	25		
Rock Creek OHV System		**Acres**	**% Acres**	**% Cause**
Total Lightning Fires	28	8	7%	32%
Total Human Caused Fires	60	116	94%	68%
Total Fires	88	124		
Gibson Prairie OHV System		**Acres**	**% Acres**	**% Cause**
Total Lightning Fires	2	0.30	1%	14%
Total Human Caused Fires	12	21	99%	86%
Total Fires	14	21		
Bear Creek OHV System		**Acres**	**% Acres**	**% Cause**
Total Lightning Fires	15	2	18%	25%
Total Human Caused Fires	45	10	82%	75%
Total Fires	60	12		
Mt. Defiance OHV System		**Acres**	**% Acres**	**% Cause**
Total Lightning Fires	2	2	59%	20%
Total Human Caused Fires	8	1	41%	80%
Total Fires	10	3		

3.10.2. Effects Analysis

Alternative 1 – No Action

Since it is difficult to accurately determine fire ignition locations and fire size for any given year, Alternative 1 would not increase or decrease fire starts, sizes, or potentials based on the historical fire data. Percentages for each area would not drastically change unless there was an increase or decrease of human use in a given area, or a change in local weather patterns occurred to increase or decrease lightning occurrence. Potential fire growth would remain the same, based on ignition location, access, available initial attack resources, and weather conditions. Weather and fuel conditions change yearly, but whether an ignition occurs or not depends entirely on an available ignition source (lightning or human), available fuel bed, fuel moistures low enough to support combustion, weather conditions conducive to sustaining an ignition, and other fire behavior factors dependent on location of any potential ignition (e.g., slope, aspect, elevation, and fuel type).

Action Alternatives

The effects of each of the proposed OHV systems are discussed below.

Peavine Proposed OHV System

The Peavine analysis area is not as heavily used for recreation as some of the other proposed OHV systems. However, decommissioning some of the roads (mainly near the south end of the Snive Creek area) could impact suppression response times, thereby increasing acres involved in a fire and a corresponding increase in suppression costs. Most of the other locations within the Peavine analysis area have roads or trails as mixed-use for OHVs of Class I, II, and III, which would allow some smaller suppression modules to access these roads and trails for suppression operations. Heavy equipment could be ordered to open roads or trails for access, but this would also increase suppression resource response, increasing fire size and cost of suppression.

Places such as LaDee Flats and McCubbins Gulch OHV systems show a higher human caused fire occurrence over the past 28 years, mostly in the smoking and campfire cause categories. Thus, fire starts could increase in the Peavine proposed OHV system, as a result of any increased camping dispersed and organized locations) associated with OHV use.

LaDee Flats Proposed OHV System

The LaDee Flats analysis area is heavily used by the public currently for a variety of activities, including OHV use. Human caused fires already account for almost 90% of the starts in the analysis area, so any increase would arise from potential increased dispersed camping.

With the exception of a few short spur roads that would be decommissioned, access for fire suppression operation would not be significantly hindered. Most of the areas in the proposed LaDee Flats OHV system have the roads or trails as mixed-use for OHVs of Class I, II, and III, which would allow some smaller suppression modules to access these roads and trails for suppression operations. Heavy equipment could be ordered to open roads or trails for access, but this would also increase suppression resource response, increasing fire size and cost of suppression. The one area in the LaDee analysis area that is currently a concern and would be during suppression operations is the 4610 Road along the Salmon-Huckleberry Wilderness. If an ignition began along this corridor, either lightning or human caused, the condition of the road would limit access by suppression resources. If OHVs (in this case Class II) are encountered during initial attack, this could increase suppression response time, increasing cost and acres lost to an ignition (See the project records for Size and Cost Comparisons for suppression operations and time to IA).

Graham Pass Proposed OHV System

Access into the Graham Pass proposed OHV system, per the map is fairly good, but many roads have been washed out or reclaimed by vegetation due to reduced road maintenance funding, as was discovered by fire suppression resources in 2008 when responding to lightning caused fires in the area. There would most likely be an increase in human caused ignitions from increased dispersed camping, trail use, and other recreational activities associated with designating this OHV system. Sizes of fires may not increase overall, due to the limited time of access and the higher moisture content of the fuels in this location, but suppression resources would still have increased response time due to distance and road conditions in the proposed location. Heavy equipment could be ordered to open roads or trails for access, but this would also increase suppression resource response, increasing fire size and cost of suppression.

McCubbins Gulch Proposed OHV System

As almost 90% of the fires within the analysis area are currently human caused, and most of those are related to either camping or smoking. A general increase of fire occurrence would occur related to any increased camping activities (and the associated human activities). Thirty human caused fires over 28 years is 1.07 human caused fires per year, for less than an acre per year of fire damage. With the exception of a one short spur road that would be decommissioned, access for fire suppression operations would not be significantly hindered (although the Camas Fire in 2005 did increase some in size, as the spur road into the fire had been blocked for wildlife purposes, and there was a two hour delay in lining and mop-up of the fire until a dozer could arrive and open the road for suppression resources).

Many of the routes in the McCubbins Gulch OHV system have roads or trails proposed as mixed-use for OHVs of Class I, II, and III, which would allow some smaller suppression modules to access these roads and trails for suppression operations. Heavy equipment could be ordered to open roads or trails for access, but this would also increase suppression resource response, increasing fire size and cost of suppression. The 240 spur road is a current access road through the middle of the McCubbins Gulch analysis area that is slated to be converted to a trail, which may slow response time, but there are other roads surrounding this area, so the impact to suppression operations would be minimal. Increased OHV use could also impact suppression operations on the mixed-use roads, especially during Initial Attack.

Rock Creek Proposed OHV System

The proposed OHV system would extend trails from the existing use area near Sportsman Park, upslope to the 4811 – 4860 road systems, converting one existing spur road (the 4820-150 road and spurs) into a connecting trail. The Rock Creek OHV System has roads or trail as mixed-use for OHVs of Class I, II, and III, which would allow some smaller suppression modules to access these roads and trails for suppression operations. Heavy equipment could be ordered to open roads or trails for access, but this would also increase suppression resource response, increasing fire size and cost of suppression. Near some of the proposed conversion of roads to trails along the 4811 and 4812 road systems is the point of origin for the 1973 Rocky Burn. This is a human caused fire, started by equipment used in timber harvesting, which consumed 7500 acres, and threatened the community of Sportsman Park and Wamic. A large fire in this area is a concern, as prevailing westerly winds could move any fire start originating from the proposed OHV location towards the WUI, and limiting access or delaying initial attack response due to heavy equipment needs to open up access could increase this potential.

The proposed Rock Creek OHV system in Alternative 3 proposes to use the road into Badger Lake as part of the route (Forest Service Road 4860-140), but as this route is located fairly far away from the main proposed OHV routes, there most likely would not be a significant increase in human caused fires beyond what currently occurs from the camping at the lake now (accessible by motorized vehicles). Most human caused ignitions in any of the wilderness' account for a small number of the overall acres from fires.

Gibson Prairie Proposed OHV System

Human caused fire starts would likely increase as use from OHVs increases (mainly from increased dispersed camping), but the percentage is currently fairly high compared to lightning caused fires, so the increase would not be significant. There is also a concern with a major wildfire threatening the Mill Creek area and the city of The Dalles. This type of fire occurred in 2002 (Sheldon Ridge Fire, 12,600 acres), which started by lightning northeast of the Gibson Prairie location on Oregon Department of Forestry protected lands and was wind driven in an easterly direction.

The Gibson Prairie analysis area has been used locally by OHVs, but not to the same extent that McCubbins Gulch, Rock Creek, or LaDee have been. The Gibson Prairie analysis area has a horse camp and the Surveyors Ridge trail runs along the western edge, and as such has a higher non-motorized use. The Gibson Prairie proposed OHV system has roads or trails as mixed-use for OHVs of Class I, II, and III, which would allow some smaller suppression modules to access these roads and trails for suppression operations. Heavy equipment could be ordered to open roads or trails for access, but this would also increase suppression resource response, thereby increasing fire size and cost of suppression.

Most the proposed routes are on existing roads and trails, or are in areas that are currently being treated through fuels reduction projects (such as the North Fork Mill Creek Restoration EA and The Dalles Watershed Fuel Break EA). One major area of concern would be the North Section Line trail along the northern boundary of The Dalles Watershed. Increased activity along this trail could increase the potential for a fire that could threaten the municipal watershed of the city of The Dalles. Currently, this area is being treated to create a fuel break, which does follow the North Section Line trail, which should reduce the potential for a fire start to increase rapidly and threaten the watershed significantly. Other trails and routes within the proposed North Fork Mill Restoration project area would have various fuels treatments applied that would also minimize the impacts for an ignition.

Bear Creek Proposed OHV System

There could be an anticipated increase in human caused fires, as this proposed location has the lowest human caused fire starts of all the OHV systems being analyzed. Part of this reduction of fire occurrence could be from a lack of direct access to the area, from the loss of the bridge across the Middle Fork of the Hood River in 2006, on Forest Service Road 16. With a return of access to the area, as well as an emphasis to use as a designated OHV system, an increase of 10% in human caused fires could occur (based on the other locations that have a higher recreational use, such as McCubbins and Rock Creek). This is about five fires over the same time frame (28 years).

The proposed OHV system would create new trails for Class III OHVs only, with no road to trails conversions. In the proposed Bear Creek OHV system, most of the roads would remain, which would still allow heavier suppression units to access the area for suppression operations. The trails would require hand crews or OHVs to access for suppression operations, although many of the trails are currently in or have access through closed roads from harvest activities. Heavy equipment could be ordered to open roads or trails for access, but this would also increase suppression resource response, increasing fire size and cost of suppression.

Mt. Defiance Proposed OHV System

There could be an anticipated increase in human caused fires, as access would increase to Forest lands from the adjacent county roads. The area has been previously harvested, so acreage from fires caused by humans and lightning should stay similar in size.

In the proposed Mt Defiance OHV system, most of the roads would remain, which would still allow heavier suppression units to access the area for suppression operations. Heavy equipment could be ordered to open roads or trails for access as needed, but this would also increase suppression resource response, thereby increasing fire size and cost of suppression.

Summary of Effects for Action Alternatives

Across the OHV systems proposed, some roads are converted to trails, while other roads are blocked off/ removed from the Forest Service road system. While many of these trails and roads can be opened/widened to allow suppression resources access to an area with an ignition, delays while this operation is occurring can limit suppression capabilities, increase fire size, which increases cost, and exposes firefighters to greater safety concerns (see Table 3-113 below for fire size to cost based on elapsed time of an established fire). Current initial attack response on the Forest depends on access for heavy engine modules (3-5 personnel, 500-1000 gallons of water), and efficient initial attack by these modules relies on the use of water in conjunction with direct attack methods. Without the use of water in the suppression efforts, the line production capability of initial attack units is reduced.

Many of the proposed OHV systems already have a high human caused fire percentage due to their current uses for recreation, OHVs, hunting, camping, and other outdoor activities. The proposed Peavine system is in an area that has a higher lightning caused fire percentage than human. In this location, there would likely be an increase in human caused fires over time, as dispersed camping increases with use of the proposed system. As campfires are the leading cause of human ignitions across the Forest, followed by smoking, and the miscellaneous categories, this would be a direction that fire occurrence would move towards (an increase of human caused ignitions), for all locations, as there would be an associated increase in the potential for more ignitions in these categories. As these types of ignitions tend to be in areas that are generally accessible for initial attack resources (e.g., campgrounds and dispersed campsites), it is likely that larger fires would still result from lightning caused ignitions.

Table 3-113. Suppression costs based on fire behavior and size of IA fires (through the first four hours).

Station Name (Number)	Redbox (350718)		Wanderer's Peak (350726)		Blue Ridge (350811)		Wamic Mill (350913)		Wamic Mill (350913)		Pollywog (350912)	
OHV System	Peavine and Graham Pass		LaDee Flats		Bear Creek and Mt. Defiance		McCubbins Gulch and Rock Creek		McCubbins Gulch and Rock Creek		Gibson Prairie	
Percentile Range	90th	97th	90th	97th	90th	97th	90th	97th	90th	97th	90th	97th
Size in Acres; Cost in Dollars												
Size - 1 hr	1.6	2.5	1.5	4.7	6.5	12.0	5.3	10.8	3.6	8.4	3.1	5.9
Cost	4,818	7,528	4,517	14,152	19,572	38,040	15,958	34,236	10,840	25,292	9,334	17,765
Size - 2 hrs	6.3	10.0	5.9	18.7	26.1	48.0	21.2	43.2	14.1	33.5	12.4	23.4
Cost	18,969	31,700	17,765	59,279	82,737	152,160	67,204	136,944	44,697	106,195	39,308	74,178
Size - 3 hrs	14.3	22.5	13.3	42.0	58.8	108.0	47.7	97.2	31.6	75.3	27.9	52.7
Cost	45,331	71,325	42,161	133,140	186,396	545,292	151,209	308,124	100,172	238,701	88,443	167,059
Size – 4 hrs	25.4	40.0	23.6	74.4	104.5	192.0	84.7	172.7	56.3	133.9	49.7	93.6
Cost	80,518	126,800	74,812	235,848	527,621	969,408	268,499	871,962	178,471	676,061	157,549	296,712
Fuel Model, NFFL	10		10		10		10		9		10	
Note:	Costs are based on the average cost, per 2008 data, on the fire size class of a given fire. Costs for fires in difficult to reach locations generally have higher costs than those easily accessible by Initial Attack resources. Suppression costs assume that a fire is contained at the end of the four hours or earlier. Longer fire growth times would incur a much larger cost to attain a final suppression strategy.											

3.10.3. Incomplete and Unavailable Information

As noted above, the current fire start/cause database does not include a specific category for human caused fires where ignition occurs specifically from an OHV.

3.11. Transportation and Safety

This analysis is based on the information found in the Transportation and Mixed-Use Analysis Reports for this project, which is in the project record located at the Forest Headquarters Office in Sandy, Oregon.

3.11.1. Existing Condition

The total miles of roads on the Mt. Hood National Forest peaked between 1988 and 1991 with approximately 3,850 miles. Forest roads were primarily constructed to access timber production lands and were paid for largely through timber sale receipts. Road maintenance was funded largely by timber sales and congressional appropriations. However, since 1990, timber harvest has declined, which drastically has reduced road maintenance accomplished by timber purchasers and the deposits they made for road maintenance. In order to respond to the Forest's deteriorating transportation system, a special emphasis program for road decommissioning began in the 1990s, which reduced the total miles to the current inventory of 3,383 miles. Currently, Oregon State Law allows OHVs to travel on single-lane, gravel and native-surfaced roads, which is approximately 2,463 miles of roads on the Forest.

Road Maintenance

Road maintenance is defined as the upkeep of the entire forest transportation facility including surface and shoulders parking and side areas, structures, and such traffic control devises as are necessary for its safe and efficient utilization. Road maintenance excludes activities that would increase its capacity or upgrading it to serve a different purpose from originally intended. Maintenance includes work needed to meet laws, regulations, codes and other legal policies as long as the original intent or purpose of the road is not changed. A road is considered to be fully maintained when the maintenance activities are completed that leaves the road in a condition that meets the criteria as stated by its Road Management Objectives (RMO).

All Forest system roads are assigned maintenance levels, which describe in general terms the type of traffic that uses each road and the level of maintenance intended for the road. Maintenance levels 1 through 5 are defined in the Forest Service Handbook 7709.59 chapter 62 (Transportation System Maintenance). Road maintenance costs associated with roads are grouped into four cost categories:

1. Surfacing costs: All costs associated with repairing the road surface;
2. Road prism costs: All costs associated with repairing damage such as slides, slumps and shoulder cracking;
3. Safety costs: Items such as sign repair, brushing, improving turnouts and road widening.
4. Drainage costs: Items such as repairing or adding culverts, cleaning plugged culverts and cleaning plugged ditches.

These four categories help determine the type of maintenance needed for a specific road identified for maintenance. There are different costs involved in each category; one or all four categories may be used on any specific road identified for maintenance needs. The cost that should be performed on maintenance level 1 and 2 roads on the Forest is approximately $1,231,500 annually and the Forest only receives a portion of that amount each year for road maintenance. There is a cost to maintain closure devises on level 1 roads when the closure devise has been compromised. Currently, the average cost of brushing (opening the site distance of a road prism by trimming back the vegetation) roads is $1,000 per mile.

The OHV project may aid the Forest's Roads and Engineering Department in decreasing the amount of miles of level 1 and 2 Forest Service roads needing maintenance by converting the proposed roads to OHV trails. These roads would no longer be managed as level 1 and 2 roads. After the roads are converted to trail, they would be removed from the roads inventory and become the Recreation Department's trail to manage for maintenance and safety. This would lower the total miles of level 1 and 2 roads Forestwide that are in need of maintenance, one of the management objectives stated in the Forest Plan. This plan includes all the standards and guidelines the Roads and Engineering Department uses to direct the management of the Forest's transportation system within the Forest.

The eight locations proposed for this project were chosen because of their current attraction to OHV users. The proposed OHV locations have suffered road damage to the prism of the road, which includes the ditches, fill slopes and intersections of roads, due to OHV use. The current amount of funding the Roads and Engineering Department receives for repairing this type of damage is usually used on higher service level roads, such as maintenance level 3, 4, 5 roads (these roads are maintained for two wheel drive, lower clearance vehicles). Funding is available for OHV repair if there are proposed OHV roads or areas established. The Forest Service would be able to maintain OHV damage more effectively once the OHV systems are established and the funding has become available to do so. Some of these funding sources could come from the State and County.

Road Management

The objective of managing the Forest's transportation system, as highlighted in the *Mt. Hood Road Analysis* (US Forest Service 2003), is to provide user safety, convenience, and efficiency of operations in an environmentally responsible manner and to achieve road related ecosystem restoration with the limits of current or likely funding levels. Responsible officials have been directed to use a roads analysis process to ensure that road management decisions are based on identification and consideration of social and ecological effects (Forest Service Manual 7700). Therefore, the forest-wide *Mt. Hood Roads Analysis* addressed both the access benefits and ecological costs of road-associated effects, gave priority to reconstructing and maintaining needed roads and decommissioning unneeded roads, or, where appropriate, converting them to less costly and more environmentally beneficial other uses.

The *Mt. Hood Roads Analysis* assessed the arterial, collector and local routes that were part of the Forest transportation system at that time. The analysis did not analyze unauthorized roads. The arterial and collector roads were, for the most part, maintenance level 3, 4 and 5 roads. A list of decision roads was formed from this analysis most being maintenance level 1-2 roads. Decision roads are roads decided upon by forest leadership team and Forest Supervisor on their purpose and need on the Forest in the future. If the roads were not seen as needed, then they were put on the decision road list. For this OHV project, the level 1-2 roads chosen to become OHV trails were checked with the list of decision roads and 97% of them were on the decision list. These roads listed on the decision list also aides the Roads and Engineering Department in decreasing the amount of miles of roads Forestwide. Roads that were not identified on the roads decision list have been assessed as a "motorize mixed use" road.

Mixed-Use Analysis

The Oregon Vehicle Code (OVC) defines a "highway" as "every public way, road, street, thoroughfare and place, including bridges, viaducts and other structures within the boundaries of this state, open, used or intended for use of the general public for vehicles or vehicular traffic as a matter of right" (OVC 801.305). The state term "highway" does not apply to Forest Service maintenance level 1 and 2 roads, nor does it apply to motorized trails. Under the OVC, un-licensed and unregistered OHVs may not be operated on "highways". The Forest Service can pre-empt state law if it is found that the maintenance level 3, 4 or 5 road is designed and constructed so as to permit the use by regular vehicular traffic along with the operation of OHVs on that road. The process the Forest Service uses to make the determination that regular vehicular traffic and OHVs can be operated on the same road is called "Mixed Use Analysis".

The process the Forest Service uses to make the determination that regular vehicular traffic and OHVs can be operated on the same road is called "Mixed-Use Analysis". Motorized mixed-use is defined as designation of a National Forest System (NFS) road for use by both highway-legal and non-highway-legal motor vehicles (FSM Engineering 7700-30). The policy for the Forest Service is to conduct a motorized "Mixed-use Analysis" on all maintenance level 2 roads as well as any maintenance level 3, 4, or 5 road where mixed-use is proposed. All roads proposed for mixed-use in this project were reviewed in the field and have a report.

Designating NFS roads for motorized mixed-use involves safety and engineering considerations. A qualified engineer[6] determines how detailed the analysis is to be and may choose to do an evaluation based on factors in the Forest Service Manual (Engineering) 7700-30, or other factors. The qualified engineer determines the factors to be considered for the specific road, road segment, or road system being analyzed in consultation with recreation managers or others familiar with operation of non-highway legal vehicles and with travel management cooperators. The level of analysis is based on personal knowledge, expertise, and experience.

Based on the analysis conducted, the qualified engineer identifies risks and prepares recommendations for the appropriate responsible official. The recommendations may include mitigation measures that would reduce the risk associated with designating the road for motorized mixed-use. A summary of the probability and severity of crashes for each road or road segment proposed for mixed-use under the proposed alternatives is presented below. Please refer to the Mixed-Use Analysis Report found in the project file at the Forest Headquarters Office in Sandy, Oregon for the entire report.

6 A "qualified engineer" is defined as "An engineer who by experience, certification, education, or license is technically trained and experienced to perform the engineering tasks specified and is designated by the Director of Engineering, Regional Office" (FSM 7705)).

3.11.2. Effects Analysis

Alternative 1 – No Action

With Alternative 1, road maintenance costs would continue to cost $1,231,500 to maintain all level 1 and 2 roads. Also, these roads would continue to receive limited funding and therefore, maintenance needs may not be adequately met.

With the exception of the existing OHV use in McCubbins Gulch, there are no signs alerting all operators of OHV use on a road. Currently, there are no signs to share available road width, especially on curves. Although the entire road system was not reviewed in the field, given the current amount of use by full-sized and OHV vehicles, the sight distance on the roads, the speeds which all vehicles are operated, and the behavior of many operators across the entire road system, it is estimated that there is a moderate to high probability of crashes. The speeds at which all vehicles are operated indicate moderate to high severity of crashes.

Alternative 2 – Proposed Action

With this alternative, approximately 48 miles of NFS roads would be converted to OHV trails and subsequently removed from the NFS roads inventory[7]. This would decrease the road mileage for level 1 and 2 roads from 2,463 miles to 2,415 miles, which is approximately 1% of the Forest's total mileage. Maintenance costs on level 1 and level 2 roads would also decrease by $24,000 annually.

With Alternative 2, approximately 4.6 miles of maintenance level 1 roads would be reopened and converted to maintenance level 2 OHV mixed use roads. This would cost the Engineering Department approximately $8,611 to reopen and convert the road prism to the standards of a level 2 mixed-use OHV road. Due to the conversion of 7.1 miles of level 1 roads to OHV trails, there would still be 2.5 miles of level 1 roads removed from Engineering's road logs and database resulting in less level 1 roads to maintain. Under this alternative, the brushing maintenance of the road prism on mixed-use portions of OHV roads would cost approximately $72,150 annually (traditionally brushing of NFS roads occurs on a three to five year rotation and does not occur on all maintenance level 2 roads). Currently, level 1 roads do not receive brushing maintenance because they are considered in 'storage" (i.e., closed for use). Due to public safety, brushing may need to occur on a shorter rotation cycle on mixed-use portions of proposed OHV roads.

Under Alternative 2, 13 miles of Forest roads are proposed to be decommissioned, which would reduce the overall maintenance costs for the Forest's transportation system.

Timber sale areas may coincide within proposed OHV roads. The Forest would restrict OHV access and/or commercial use on mixed-use routes to reduce risks during commercial haul, or special events.

Any staging areas that are proposed within quarries have been field verified and confirmed to exist on previously disturb soils and not impose upon the administrative use of the quarries proposed. Measures would be taken to prevent mixing administrative road use with OHV use at the same time in any proposed quarries staging areas.

Alternative 2 has approximately 72.7 miles proposed for mixed-use (see Table 3-114). Estimated probability and severity of crashes *without* PDC range from low to high. Estimated probability and severity of crashes *with* PDC range from low to medium.

7 The roads converted to trails would now become part of the Forest's recreational trail system.

Table 3-114. Miles of mixed-use by proposed OHV system for Alternative 2.

OHV System	Miles of Mixed-Use
Bear Creek	0.0
Gibson Prairie	5.4
Graham Pass	0.0
LaDee Flats	26.3
McCubbins Gulch	8.7
Mt. Defiance	0.0
Peavine	15.8
Rock Creek	16.5
Total	**72.7**

Alternative 3

Under Alternative 3 approximately 93.8 miles of NFS roads would be converted to OHV trail, and subsequently removed from the NFS roads inventory. This would decrease the road mileage of level 1 and 2 roads from 2,463 miles to 2,369 miles, which is approximately 1.03% of the Forest's total mileage. Maintenance costs on level 1 and level 2 roads would also decrease by $47,000 annually.

Under this alternative the brushing maintenance of the road prism on mixed-use portions of roads would cost approximately $74,700 annually (traditionally brushing of NFS roads occurs on a three to five year rotation and does not occur on all maintenance level 2 roads). Currently, level 1 roads do not receive brushing maintenance since they are considered in 'storage'. Due to public safety, brushing may need to occur on a shorter rotation cycle on mixed-use portions of proposed OHV roads.

Under Alternative 3, 35 miles of Forest roads are proposed to be decommissioned, which would reduce the overall maintenance costs for the Forest's transportation system.

There is no significant change to the maintenance level of mixed-use roads proposed in this alternative; therefore, there are no changes to the maintenance costs compared to the existing situation.

Timber sale areas may coincide within proposed OHV roads. The Forest would restrict OHV access and/or commercial use on mixed-use routes to reduce risks during commercial haul, or special events.

Any staging areas that are proposed within quarries have been field verified and confirmed to exist on previously disturb soils and not impose upon the administrative use of the quarries proposed. Measures would be taken to prevent mixing administrative road use with OHV use at the same time in any proposed quarries staging areas.

Alternative 3 has approximately133 miles proposed for mixed-use (see Table 3-115). Estimated probability and severity of crashes *without* PDC range from low to high. Estimated probability and severity of crashes *with* PDC range from low to medium.

Table 3-115. Miles of mixed-use by proposed OHV system for Alternative 3.

OHV System	Miles of Mixed-Use
Bear Creek	7.6
Gibson Prairie	4.1
Graham Pass	53.5
LaDee Flats	18.4
McCubbins Gulch	3.2
Mt. Defiance	6.0
Peavine	11.7
Rock Creek	28.4
Total	**132.9**

Alternative 4

Under Alternative 4 approximately 33.3 miles of NFS roads would be converted to OHV trail, and subsequently removed from the NFS roads inventory. This would decrease the road mileage of level 1 and 2 roads from 2,463 miles to 2,430 miles, which is approximately 1% of the Forest's total mileage. Maintenance costs on level 1 and level 2 roads would also decrease by $16,500 annually. Under this alternative the brushing maintenance of the road prism on mixed-use portions of routes would cost approximately $26,060 annually (traditionally brushing of NFS occurs on a three to five year rotation and does not occur on all maintenance level 2 roads). Currently, level 1 roads do not receive brushing maintenance since they are considered in 'storage'. Due to public safety, brushing may need to occur on a shorter rotation cycle on mixed-use portions of proposed OHV roads.

Under Alternative 4, 12 miles of NFS roads are proposed to be decommissioned, which would reduce the overall maintenance costs for the Forest's transportation system.

There is no significant change to the maintenance level of mixed-use roads proposed in this alternative; therefore, there are no changes to the maintenance costs compared to the existing situation.

Timber sale areas may coincide within proposed OHV roads. The Forest would restrict OHV access and/or commercial use on mixed-use routes to reduce risks during commercial haul, or special events.

Any staging areas that are proposed within quarries have been field verified and confirmed to exist on previously disturb soils and not impose upon the administrative use of the quarries proposed. Measures would be taken to prevent mixing administrative road use with OHV use at the same time in any proposed quarries designated as staging areas.

Alternative 4 has approximately 26.9 miles proposed for mixed-use (see Table 3-116). Estimated probability and severity of crashes *without* PDC range from low to high. Estimated probability and severity of crashed *with* PDC range from low to medium.

Table 3-116. Miles of mixed-use by proposed OHV system for Alternative 4.

OHV System	Miles of Mixed-Use
Bear Creek	0.0
Gibson Prairie	0.0
Graham Pass	0.0
LaDee Flats	9.5
McCubbins Gulch	0.0
Mt. Defiance	0.0
Peavine	0.0
Rock Creek	17.4
Total	**26.9**

Summary

Table 3-117 summarizes the miles of roads to be converted as an OHV trail by alternative. These roads would no longer be managed as part of the Forest's transportation system, and therefore, would no longer require "road maintenance".

Table 3-117. Miles of road to be converted to OHV trail by alternative.

	ML 1	ML 2
Alternative 1	0.0	0.0
Alternative 2	4.56	43.44
Alternative 3	31.27	62.43
Alternative 4	11.67	21.59

The following table compares the total costs on a routine basis (approximately five year rotations) to maintain level 1 and level 2 roads for each alternative. For level 1 and 2 roads, maintenance costs are greatest in Alternative 1 (No Action) and least in Alternative 3. Table 3-118 displays the costs associated with each alternative for both maintenance level 1 and 2 roads.

Table 3-118. Total costs to maintain ML 1 and 2 roads by alternative.

Alternative	Total Miles Open	Total Cost
Alternative 1	2,463	$1,231,500
Alternative 2	2,415	$1,207,500
Alternative 3	2,369	$1,184,500
Alternative 4	2,430	$1,215,000

The following table compares the total miles of mixed-use proposed by alternative. Using the number of miles of road open to mixed-use as an overall indicator of probability of crashes to compare alternatives, Alternative 1 has the highest probability of crashes. Alternatives 3 and 2 follow, and Alternative 4 has the least probability of crashes.

Table 3-119. Total miles of mixed-use proposed by alternative.

Alternative	Miles of Mixed-Use
1	2,463
2	73
3	130
4	26

Alternative 1 does not include special signing to advise operators of all vehicles that there may be mixed-use on the road. Alternatives 2, 3 and 4 include PDC which are designed to reduce crash probability and severity.

Alternative 1 has the highest potential severity because there would be no brushing in specific areas other than the normal brushing cycle. Most maintenance level 2 roads would only be brushed when there is timber haul. Alternatives 2, 3 and 4 have specific routes that may receive concentrated maintenance. The potential for high severity is most influenced by speed and operator behavior, and therefore can occur on any road open to mixed use.

3.11.3. Incomplete and Unavailable Information

Road mileage and costs per mile data was gathered via the Forest Service I-Web database. The most updated information on road miles and costs within the database is September 2007. Maintenance costs may have increased and road mileages per service level may have change slightly. GIS data on road mileage may vary with I-Web information due to the process of collecting mileage through the creation of the GIS roads database file.

3.12. Air Quality and Climate Change

This analysis is based on the information found in the Air Quality Report for this project, which is in the project record located at the Forest Headquarters Office in Sandy, Oregon.

3.12.1. Affected Environment – Air Quality

Fugitive dust (mostly composed of small soil particles) created by OHV traffic has the potential to contribute to air quality problems. Forman and others (2003) found that fugitive dust suspended in the air may impact more total area than any other impact from roads. Dust is created as OHVs disturb soil crusts and generate wind currents. Once soil surfaces are disturbed, wind erosion may increase the amount of material in the air (Lovich and Bainbridge 1999).

Additionally, 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 (NOx), sulfur dioxide (SO2), carbon monoxide (NO), and ozone (O3). Research has shown that a small two-stroke engine (e.g., a 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 a variety of impacts on vegetation.

In accordance with the Clean Air Act (CAA) and its amendments, National Ambient Air Quality Standards (NAAQS) have been established by the U.S. Environmental Protection Agency (EPA) for pollutants including lead (Pb), ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), Total Suspended Particulates (TSP), and particulates with aerodynamic diameters of less than 10 microns (PM10) and less than 2.5 microns (PM2.5). State and federal air quality standards are shown in Table 3-122. Primary standards are designed to protect human health with a margin of safety while secondary standards are established to protect the public welfare from any known or anticipated adverse effects such as soiling, corrosion, or damage to vegetation.

Table 3-120. State and Federal air quality standards.

Pollutant	Federal Standards		Oregon Standards
	Primary	Secondary	
Total Suspended Particulates			
Annual Geometric Meana	no standard	no standard	no standard
24-hour Average	no standard	no standard	no standard
Lead (Pb)			
Quarterly Average	1.5 µg/m3	1.5 µg/m3	1.5 µg/m3
Particulates			
PM10			
Annual Arithmetic Mean	50 µg/m3	50 µg/m3	50 µg/m3
24-hour Average	150 µg/m3	150 µg/m3	150 µg/m3
PM2.5			
Annual Arithmetic Mean	15 µg/m3	15 µg/m3	15 µg/m3
24-hour Average	65 µg/m3	65 µg/m3	65 µg/m3
Sulfur Dioxide (SO2)			
Annual Average	0.03 ppm	no standard	0.02 ppm

Table 3-120. (continued)

Pollutant	Federal Standards		Oregon Standards
	Primary	Secondary	
24-hour Average	0.14 ppm	no standard	0.10 ppm
3-hour Average	no standard	0.50 ppm	0.50 ppm
1-hour Average	no standard	no standard	no standard
Carbon Monoxide (CO)			
8-hour Average	35ppm	35ppm	35 ppm
1-hour Average	9ppm	9ppm	9 ppm
Ozone (O3)			
1-hour Averageb	0.12 ppm	0.12 ppm	0.12 ppm
8-hour Average	0.08 ppm	0.08 ppm	0.08 ppm
Nitrogen Dioxide (NO2)			
Annual Average	0.053 ppm	0.053 ppm	0.053 ppm

Source: ODEQ, 2002.
Notes: Primary standards are listed in this table as they appear in the federal regulations; ambient concentrations are rounded using the next higher decimal place to determine whether a standard has been exceeded. The data in this report are shown with these unrounded numbers.
aAnnual standards never to be exceeded, short-term standards not to be exceeded more than once per year unless noted.
bNot to be exceeded on more than 1.0 days per calendar year. ppm = parts per million µg/m3 = micrograms per cubic meter.

The EPA retains oversight authority, but has delegated enforcement to the states. In this case, the State of Oregon is required to develop and administer air pollution prevention and control programs. In Oregon, the state has adopted most of the federal ambient air quality standards as reflected in the CAA.

The Mt. Hood Wilderness is designated as a Class I Area under the Clean Air Act amendments of 1977. National wilderness areas, national parks, and national wildlife refuges in existence at the time the amendment was passed are classified as Class I. This class provides the most protection to pristine lands by severely limiting the amount of additional human derived air pollution which can be added to these areas. All other areas are designated as Class II. Class II airsheds allow a greater amount of human derived air pollution added to the area compared to Class I airsheds.

Air quality monitoring is currently being conducted on the Mt. Hood National Forest and adjacent areas by the Forest Service and the Oregon Department of Environmental Quality (ODEQ). The Forest Service maintains an air quality station on Mt. Hood to monitor ozone and particulates and a station at Wishram, Washington which monitors visibility of Mt. Hood and adjacent areas. ODEQ also maintains an air quality monitoring site at the top of the Mt. Hood Ski Bowl chairlift on Multorpor Mountain. The purpose of the three stations is to monitor visibility in the Mt. Hood Wilderness' Class I airshed. In general, visibility is good, with most impairment in the "perceptible" category. In the nine years of available data (1994 through 2002), the Mt. Hood Wilderness visibility typically has been better than at Crater Lake National Park and comparable to the central Cascades area—the two other visibility impairment monitoring sites in Oregon (ODEQ, 2002).

3.12.2. Effects Analysis – Air Quality

Alternative 1 – No Action

Direct and Indirect Effects

Under Alternative 1, both the National and State Ambient Air Quality Standards would continue to be met. No changes to current use patterns are expected so this would not result in any changes to the current air quality situation.

Cumulative Effects

OHV use overlaps in space and time with other activities on the Forest. The primary potential cumulative effect would be mixing of fugitive dust on existing road systems with other vehicles and equipment. This is expected to be a fairly infrequent event and very localized in nature.

The table below provides a qualitative summary of potential cumulative air quality effects for Alternative 1. It shows existing and potential projects, effects from those projects that may result in cumulative effects with this OHV project, whether these projects overlap in time and space and an assessment if a measurable cumulative effect is expected.

Table 3-121. Potential air quality cumulative effects for Alternative 1.

Project	Potential Effects	Overlap in		Measurable Cumulative Effect?	Extent, Detectable?
		Time	Space		
Forest Service Vegetation Treatment Activities Planned or Underway (The Dalles Watershed Fuelbreak, North Fork Mill Restoration Project, Sportsman's Park Hazardous Fuels Reduction, No Whisky Plantation Thinning, Upper Clackamas Plantation Thinning, Cascade Crest Fuel Break Project, Pre-commercial treatments)	Air Quality	Yes	Yes	Not Measurable	Fugitive dust and exhaust emissions from OHV use have a chance of mixing with dust and emissions from equipment associated with vegetation treatments. The most likely effect is mixing of dust on existing road systems from equipment using these roads. The cumulative effect is not expected to be measurable.
Ongoing road and trail maintenance	Air Quality	Yes	Yes	Not Measurable	Fugitive dust and exhaust emissions from OHV use have a chance of mixing with dust and emissions from road maintenance equipment. The most likely effect is mixing of dust on existing road systems. The cumulative effect is not expected to be measurable.
Clackamas Road Decommissioning	Air Quality	Yes	Yes	Not Measurable	Fugitive dust and exhaust emissions from OHV use have a chance of mixing with dust and emissions from road decommissioning equipment. The most likely effect is mixing of dust on existing road systems. The cumulative effect is not expected to be measurable.

Alternatives 2, 3, and 4

Direct and Indirect Effects

Under all action alternatives, short-term impacts to air quality would occur during construction. Impacts include fugitive dust, construction vehicle exhaust, and emissions from slash burning. Slash would be piled and then burned according to Oregon Smoke Management Plan Standards. These impacts would only occur during construction of the proposed project. No exceedences of Federal or State AAQS are expected from the operation of construction vehicles (including exhaust and fugitive dust generation) or slash burning due to compliance with state requirements and PDC.

OHV use can also create fugitive dust and vehicle exhaust emissions. Effects from dust and emissions are expected to be very small, localized and immeasureable at larger scales. This is due to a number of factors including the use of cleaner gasoline (lead-free), new EPA emission standards for OHVs and moderate expected use levels. On November 8, 2002, EPA issued new emission standards for recreational vehicles beginning in model year 2006. These regulations will result in cleaner emissions from new OHVs which will improve air quality through time. http://www.epa.gov/otaq/recveh.htm#regulations.

Cumulative Effects

OHV use overlaps in space and time with other activities on the Forest. The primary potential cumulative effect would be mixing of fugitive dust on existing road systems with other vehicles and equipment. This is expected to be a fairly infrequent event and very localized in nature.

The table below provides a qualitative summary of potential cumulative air quality effects for Alternatives 2, 3, and 4. It shows existing and potential projects, effects from those projects that may result in cumulative effects with this OHV project, whether these projects overlap in time and space and an assessment if a measurable cumulative effect is expected.

Table 3-122. Potential air quality cumulative effects for Alternatives 2, 3 and 4.

Project	Potential Effects	Overlap in		Measurable Cumulative Effect?	Extent, Detectable?
		Time	Space		
Forest Service Vegetation Treatment Activities Planned or Underway (The Dalles Watershed Fuelbreak, North Fork Mill Restoration Project, Sportsman's Park Hazardous Fuels Reduction, No Whisky Plantation Thinning, Upper Clackamas Plantation Thinning, Cascade Crest Fuel Break Project, Pre-commercial treatments)	Air Quality	Yes	Yes	Not Measurable	Fugitive dust and exhaust emissions from OHV use have a chance of mixing with dust and emissions from equipment associated with vegetation treatments. The most likely effect is mixing of dust on existing road systems from equipment using these roads. The cumulative effect is not expected to be measurable.
Ongoing road and trail maintenance	Air Quality	Yes	Yes	Not Measurable	Fugitive dust and exhaust emissions from OHV use have a chance of mixing with dust and emissions from road maintenance equipment. The most likely effect is mixing of dust on existing road systems. The cumulative effect is not expected to be measurable.
Clackamas Road Decommissioning	Air Quality	Yes	Yes	No	Fugitive dust and exhaust emissions from OHV use have a chance of mixing with dust and emissions from road decommissioning equipment. The most likely effect is mixing of dust on existing road systems. The cumulative effect is not expected to be measurable.

3.12.3. Background – Climate Change

On January 13, 2009, the Washington Office of the Forest Service released guidance to Forest Service units regarding the incorporation of climate change science into project-level NEPA documents. This guidance document provides that units should consider two kinds of climate change effects. First, units may, where appropriate, consider the effect of a proposed project on climate change. Second, units may, where appropriate, consider the effect of climate change on a proposed project. This latter category may include the effect of changed snowfall regimes on special use permit issuance for ski areas or the effect of rainfall changes on reforestation following a timber sale. Because potential changes in climate will have no effect on the designation of motorized routes, this second category of effects will not be considered further.

3.12.4. Effect of OHV Route Designation on Climate Change Effects Analysis

Agency direction defines the emission of greenhouse gases (GHG) as the direct climate change effect of a project. Further, the interaction of emissions with atmospheric concentrations of GHG such that they impact the climate is defined as the potential indirect climate change effect.
Under this definition, there 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 Forest are not directly affected by the designation of routes.

On the other hand, route designation may have a slight beneficial effect on climate change by restricting OHVs to designated routes and protecting forest resources from damaging traffic. Forest Service direction on climate change consideration notes, "[i]t is possible, and in some projects likely, that proposals may meet the Agency's mission while also enhancing the resilience or adaptive capacity of resources to the potential impacts of climate change. For example, projects designed to restore the health, resilience, and productivity of forested ecosystems may also improve the capability of the stands or landscape to withstand climate change stresses" (USDA 2009). While this project is not specifically designed to reduce the emission of GHG, it may have a slight benefit associated with enhancing the resilience and productivity of forested ecosystems.

Regarding indirect effects, Agency direction states, "[b]ecause greenhouse gases mix readily into the global pool of greenhouse gases, it is not currently possible to ascertain the indirect effects of emissions from single or multiple sources (projects). Also, because the large majority of Forest Service projects are extremely small in the global atmospheric CO2 context, it is not presently possible to conduct quantitative analysis of actual climate change effects based on individual projects" (USDA 2009). Again, designating OHV routes on the Forest would not have a measurable indirect effect as compared with the no action alternative.

Because the designation of motorized routes has no quantifiable direct or indirect effect on climate change, it cannot have a cumulative effect.

3.12.5. Incomplete and Unavailable Information

Total current OHV use is not complete and well documented.

3.13. Congressionally Designated Areas

3.13.1. Existing Condition

Congressionally Designated Areas

When the Forest Plan was approved, there were five rivers in the Forest (encompassing 36,096 acres) that are part of the Wild and Scenic Rivers System: Clackamas, Roaring, Salmon, Sandy and White Rivers. The 1968 Wild and Scenic Rivers Act calls for maintaining the free-flowing character of the designated rivers and protecting their "outstandingly remarkable values." Outstandingly remarkable values are values or opportunities in a river corridor that are directly related to the river and which are rare, unique or exemplary from a regional or national perspective. Detailed descriptions of the rivers and their outstandingly remarkable values are documented in river management plans posted on the Forest website (http://www.fs.fed.us/r6/mthood/publications/).

The Omnibus Public Land Management Act of 2009 (Public Law 111-11) added 81 miles to the Wild and Scenic River System, including portions of the South Fork Clackamas River, Eagle Creek, Middle Fork Hood River, South Fork Roaring River, Zigzag River, Fifteenmile Creek, East Fork Hood River, Collawash River and Fish Creek. The legal descriptions and acreage for each of these rivers that will be managed as part of the System have not yet been determined.

There are seven wilderness areas that are entirely within the Forest (Badger Creek, Bull of the Woods, Clackamas, Mark O. Hatfield, Mt. Hood, Roaring River, and Salmon-Huckleberry) and portions of two other wilderness area within the administrative boundary of the Forest (Lower White River and Mt. Jefferson). Although the entire Mark O. Hatfield Wilderness is within the proclaimed boundary of the Forest, the portion that is administered by the Columbia River Gorge National Scenic Area is not considered in this analysis. Table 3-123 shows the number of acres of each of the wilderness areas that are administered by the Forest. Since trails are the primary travel-way in wilderness, and a point of possible user conflict, the miles of trail (in the Forest) for each wilderness are also listed.

The 1964 Wilderness Act established the National Wilderness Preservation System to ensure that parts of the United States would be preserved and protected in their natural condition. A wilderness area is defined, in part, as an area that generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable. The Wilderness Act places responsibility upon the administering agency for preserving the wilderness character of the area. The Act specifically prohibits motor vehicles, motorized equipment and mechanical transport in all wilderness areas (Public Law 88-577, Sec. 4 (c) Prohibitions of Certain Uses).
The Mt. Hood and Mt. Jefferson Wildernesses was designated with the passage of the 1964 Wilderness Act. The Badger Creek, Bull of the Woods, Mark O. Hatfield and Salmon-Huckleberry Wilderness areas were designated with the passage of the Oregon Wilderness Act of 1984 (Public Law 98-328). The Omnibus Public Land Management Act of 2009 (Public Law 111-11) created the Clackamas, Lower White River and Roaring River Wilderness areas, and it enlarged the Badger Creek, Bull of the Woods, Mark O. Hatfield, Mt. Hood and Salmon-Huckleberry Wilderness areas. Both the Oregon Wilderness Act of 1984 and the Omnibus Public Land Management Act of 2009 preclude the management of lands adjacent to wilderness areas in the State of Oregon as buffer zone. Section 6 of the 1984 Act states:

> *"Congress does not intend that designation of wilderness areas in the State of Oregon lead to the creation of protective perimeters or buffer zones around each wilderness area. The fact that non-wilderness activities or uses can be seen or heard from the areas within the wilderness shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area."*

Table 3-123. Land area and miles of trail in the nine wilderness areas that are entirely or partially in the Mt. Hood National Forest. Miles of trail are those that are within the boundaries of the wilderness in the Forest. Note: The entire Mark O. Hatfield Wilderness is within the proclaimed boundary of the Mt. Hood National Forest; however the portion of the wilderness managed by the Columbia River Gorge National Scenic Area is not considered in this analysis (and is not shown in this table).

Wilderness	Total Acres	Forest Acres	Miles of Trail
Badger Creek	28,140	28,140	64
Bull of the Woods	37,607	37,607	58
Clackamas	9,470	9,470	6
Lower White River	2,870	1,750	0
Mark O. Hatfield	64,960	39,000	90
Mt. Hood	65,610	65,610	138
Mt. Jefferson	107,008	5,021	3
Roaring River	36,550	36,550	35
Salmon-Huckleberry	61,220	61,220	74
Total	**289,195**	**187,208**	**468**

Inventoried Roadless Areas

Inventoried roadless areas (IRAs) possess social and ecological values and characteristics that are becoming scarce in our nation's increasingly developed landscape. Protecting air and water quality, biodiversity and opportunities for personal renewal are highly valued qualities of roadless areas. Conserving IRAs leaves a legacy of natural areas for future generations.

The Forest Plan directs the Forest to maintain the roadless character of approximately 52,170 acres of IRAs described as the Bull of the Woods, Lake, Mt. Hood Additions, Olallie, Roaring River, Salmon-Huckleberry, Twin Lakes, and Wind Creek areas. None of the Badger Creek IRA is included in the Forest Plan for long-term management as a roadless area (US Forest Service, FEIS, Appendix p. C-6). The Omnibus Public Land Management Act of 2009 (Public Law 111-11) designated 124,240 acres as part of the National Wilderness Preservation System, and identified an additional 900 acres as potential wilderness with a process to become part of the system. Not all of the IRAs identified in the Forest Plan were designated as wilderness in 2009. Roughly 11,160 acres outside of wilderness will continue to be managed for their roadless character. Most of this acreage is in the Olallie Scenic Area.

3.13.2. Effects Analysis

Congressionally Designated Areas and Inventoried Roadless Areas

None of the proposed OHV routes in Alternatives 2, 3, and 4 are within designated wilderness areas or inventoried roadless areas. Approximately 0.4 miles of existing trail in the McCubbins Gulch OHV system are in Segment C (Scenic) of the White Wild and Scenic River. This trail segment is included in Alternatives 2, 3, and 4.

Several routes coincide with boundaries of wilderness areas, wild and scenic rivers and inventoried roadless areas (Table 3-124). In Alternatives 2, 3 and 4, approximately 17.7, 25.3 and 1.0 miles of proposed OHV routes, respectively, coincide with a specially designated area boundary.

The potential effect of OHV noise on non-motorized trails and wilderness areas is described in the "Noise Effects" section. Topography and vegetation would inhibit OHV trespass into the specially designated areas along most (but not all) of these routes.

Table 3-124. Miles of proposed OHV route by alternative and proposed system that coincide with the boundary of a congressionally designated area or inventoried roadless area in the Mt. Hood National Forest. Route miles were estimated with a map measure.

Alternative	Proposed OHV System	Route Identifier	Area Name: Wilderness (W), Wild & Scenic River (WSR), Inventoried Roadless Area (IRA)	Miles of Route Co-incident with Area Boundary
2	Bear Creek	New trail	Mt. Hood (W)	2.2
2	LaDee	Road 4610	Salmon-Huckleberry (W)	8.2*
2	LaDee	Road 4610	Roaring River (W)	12.3*
2	LaDee	Road 4610116	Clackamas (WSR)	0.5
2	McCubbins	Road 2110260	Lower White River	0.5
2	Rock Creek	Road 4812	Badger Creek (IRA)	1.2
2	Rock Creek	Road 4860	Badger Creek (IRA)	0.2
2	Rock Creek	Trail 475	Badger Creek (IRA)	0.5
2	Rock Creek	New trail	Badger Creek (IRA)	0.3
3	Bear Creek	New trail	Mt. Hood	2.2
3	LaDee	Road 4610	Salmon-Huckleberry (W)	8.2*
3	LaDee	Road 4610	Roaring River (W)	12.0*
3	LaDee	Road 4610116	Clackamas (WSR)	0.5
3	McCubbins	Road 2110260	Lower White River	0.5
3	McCubbins	Road 2110270	Lower White River	0.3
3	Rock Creek	Road 4860	Badger Creek (W)	1.2
3	Rock Creek	Road 4860160	Badger Creek (W)	5.8
3	Rock Creek	Road 4812	Badger Creek (IRA)	1.2
3	Rock Creek	Road 4860	Badger Creek (IRA)	0.8
3	Rock Creek	Trail 475	Badger Creek (IRA)	0.5
3	Rock Creek	New Trail	Badger Creek (IRA)	0.3
4	LaDee	Road 4610116	Clackamas (WSR)	0.5
4	McCubbins	Road 2110260	Lower White River	0.5

*Note: The 8.2 mile section of Road 4610 that is coincident with the Salmon-Huckleberry Wilderness is also coincident with the proposed Roaring River Wilderness.

3.14. Socio-Economic, Civil Rights, and Environmental Justice

This analysis is based on the information found in the Social and Economic Specialist Report for this project, which is in the project record located at the Forest Headquarters Office in Sandy, Oregon.

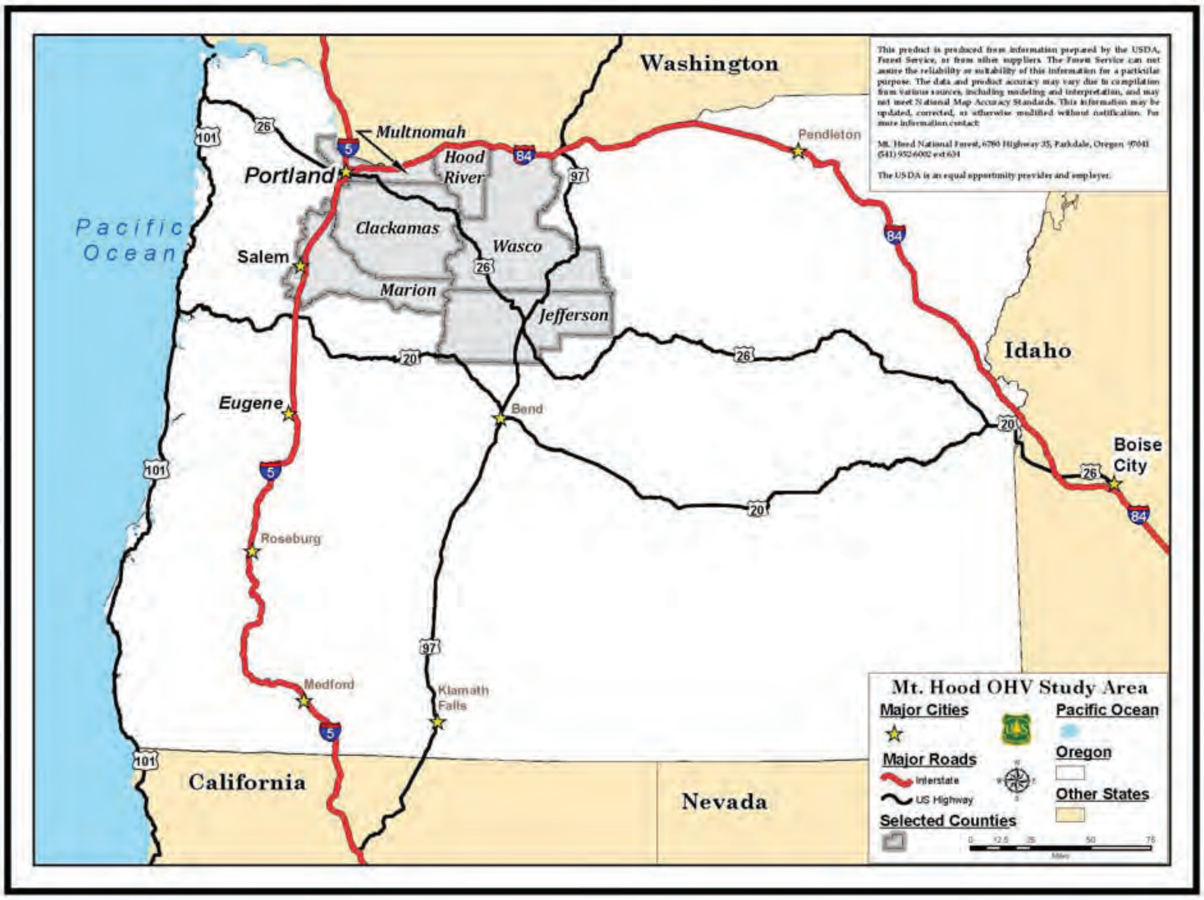
3.14.1. Affected Environment

The primary impact area covers six counties: Clackamas, Hood River, Jefferson, Marion, Multnomah, and Wasco counties (Figure 3-12). Four of the six counties -- Hood River, Jefferson, Marion, and Wasco -- are primarily rural. The economies of all these counties are based on agriculture and timber among other sectors. Other sectors in the study area are: manufacturing, commerce, recreation, hydroelectric, food processing, education, and government. Only 5% of Clackamas County's total area is urban, however, the urban area is home to 80% of the population and 90% of the job base.8 The economy of Multnomah County is different than the other four counties because it is

8 Clackamas County Economic Landscape (www.clackamas.us/docs/business/economiclandscape.pdf) p. 9. Accessed 6/30/2009.

home to Portland, a city of half million people. Manufacturing, transportation, whole sale, retail, and tourism are all important sectors in Multnomah County. (The source for the following county profiles is the Oregon Blue Book http://arcweb.sos.state.or.us/county/cpmultnomahhome.html). For more information on study area, including population and demographics, please refer to the Social and Economic Specialist Report in the project record.

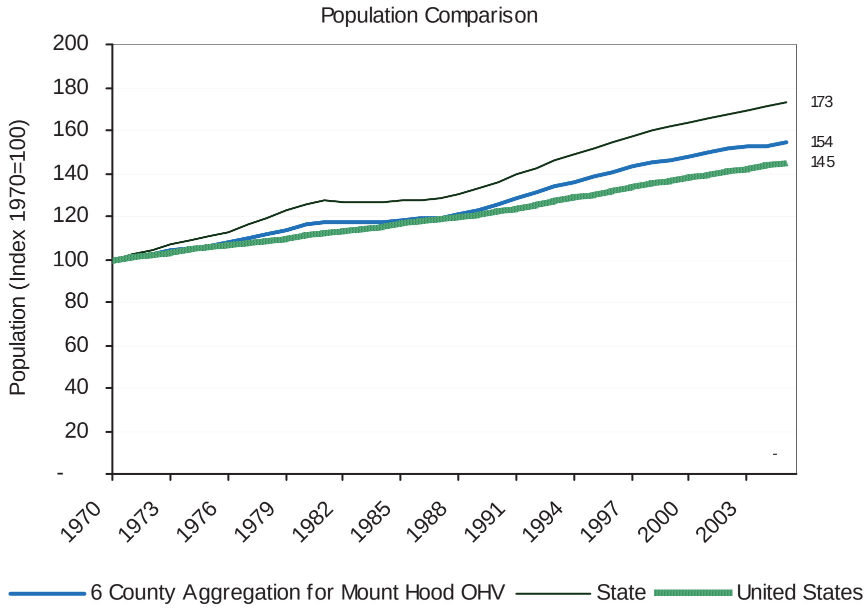
Figure 3-12. Map of Clackamas, Hood River, Jefferson, Marion, Multnomah, and Wasco counties. See Appendix I.



Population Trends

Increases in population can increase user demands on existing travel routes, access and recreation opportunities (Cordell and Overdevest 2001). According the US Census 2006 estimate, the population of the six county study area is 1.4 million. From 1970 to 2005, the population grew by 496,715 people, a 54% increase in population. At an annual rate, this represents an increase of 1.2%. Over the last 35 years, population growth in the study area has been slower than the state, but it has been faster than the nation (see Figure 3-13).

Figure 3-13. Population in the study area.



Age Distribution, Gender, Racial Composition and Poverty Levels

Components of population structure such as gender, age, and race are often predictors of attitudes, beliefs, and values about travel management, forest management, and forest use. For example, people in different age categories often belong to different generations. They often have different values that influence their attitudes and beliefs.

There is significant discussion in the literature about the aging population in the United States and the potential impacts that this change may have on patterns of forest use as well as attitudes, beliefs, and values toward forest use. Research indicates that areas that are popular retirement communities include natural amenities, such as scenic beauty and recreational opportunities, and are often in proximity to National Forests and National Parks (Cordell and Overdevest 2001). The impact of retirement aged people on their community is often complex; it includes bringing in other sources of income and the desire for different types of recreation and modes of access. An aging population also brings with it a change in the type of recreation activities.

Table 3-125 shows the age distribution for the study area. From 1990 to 2000, the number of Baby Boomers (aged 40 to 54 years old) in the area increased by 47%. Baby Boomers shared of the total population increased from 18% to 23%. The number of people under age 20 increased by 17%, but their share of the total population remained the same. From 1990 to 2000, the population density for the study area increased by 18% per square mile.

Table 3-125. Age distribution for the study area in 1990 and 2000.

	Total	Under 20 years		40 - 54 (Baby Boom in 2000)		65 years and over		Median Age	Density (Pop. per sq. mi.)
	Number	Number	Share	Number	Share	Number	Share		
Total Population									
2000	1,346,922	368,002	27%	309,530	23%	155,192	12%	35.4	165
1990	1,143,482	314,271	27%	210,891	18%	151,994	13%	34.3	140
10 Yr. Change	203,440	53,731	0%	98,639	5%	3,198	-2%	1.1	25
10 Yr. % Change	18%	17%		47%		2%		3%	18%
2000 Sex Breakout									
Male	668,679	188,590	28%	154,730	23%	63,306	9%	34.3	n/a
Female	678,243	179,412	26%	154,800	23%	91,886	14%	36.6	n/a
Male/Female Split	50% / 50%	51% / 49%		50% / 50%		41% / 59%		n/a	n/a

Demographics of OHV Use by Race, Ethnicity, and Income in the Pacific Region

The information on the age, race, and ethnicity of OHV users in Oregon is drawn from an extensive 2008 report entitled, "Off-Highway Vehicle Recreation in the United States and its Regions and States: An Update National Report" The report comes from the National Survey on Recreation and the Environment (NSRE), Internet Research Information Series (IRIS).

In the Pacific Region (i.e., California, Hawaii, Oregon, Washington, and Alaska), the rate of OHV participation (18.7%) is nearly the same as the national rate. The 6.9 million OHV users living in the Pacific region are about 16% of the national total. Similar to other regions, participation declines with age. People under age 30 are about three times more likely to participate as those over 50. Males are also significantly more likely to be OHV users than females. American Indians have the highest participation rate (31%) among racial and ethnic groups, just as they do in every other region. Thought the Hispanic rate (14%) is next to the lowest, the number of Pacific Hispanic OHV users (about 1.3 million) is second only to Whites. This is due to the large Hispanic population, especially in California.

People with family incomes over $50,000 all participated at similar rates (23 to 27 percent). Only 12% of the lowest income class participated. Similar to every other region, the highest educated strata participated at the lowest rates. Just 13% of people with post-graduate degrees were OHV users compared with 21% of high school graduates and those attending some college or technical school. Also similar to every other region, the participation rate for non-metropolitan residents (32%) was much higher than for metro-area dwellers (18%), however, since the population in the Pacific region is more than 90% metropolitan, this population group dominated the OHV users, accounting for about 89 percent of the 6.9 million participants.

Table 3-126. Percent of population and number of people age 16 and older participating in off-highway vehicle recreation, by demographic category, 1999-2007, Pacific Region (Cordell et al.).

Demographic	Strata	Population (1000s)	Sample Size	Percent participating	Participants
All Groups	All people age 16+	37,006.1	9,684	18.7	6909.2
Age	Under 30	9,742.9	2267	29.7	2898.1
	30-50	14,736.9	3999	19.0	2805.1
	51 & older	12,525.2	3230	9.7	1206.0
Gender	Male	18,360.0	4461	23.5	4303.7
	Female	18,646.0	5196	13.9	2605.6
Race/Ethnicity	White	19,901.1	6874	23.2	4613.6
	Black	1,925.2	343	16.1	310.3
	American Indian	324.8	187	30.6	99.5
	Asian/Pacific Islander	4,598.0	602	11.2	515.1
	Hispanic	9517.7	1334	13.9	1323.8
Annual Income	$25,000 or less	5,607.3	1132	12.0	673.5
	$25,000 to $49,999	7,498.1	1778	19.4	1455.3
	$50,000 to $74,999	5,932.0	1439	23.0	1364.4
	$75,000 to $99,999	3,683.5	813	23.3	859.5
	$100,000 to $149,999	3,232.6	686	24.1	779.3
	$150,000 or more	2,052.0	446	27.2	557.6
Education	Less than high school	7,171.7	938	17.9	1286.6
	High school graduate	7,396.1	1,974	20.9	1,545.7
	Some college/ tech school	10,501.4	3,076	21.5	2,259.6
	Bachelor's degree	5,191.5	2,128	15.4	800.1
	Post-graduate degree	2,704.6	1,404	12.5	338.2
Place of residence	Non-metropolitan	2,357.1	1,874	32.0	753.9
	Metropolitan	34,649.0	7,810	17.7	6,155.3

Table 3-127. Percent of population and number of people age 16 and older participating in off-highway vehicle recreation, by demographic category, 1999-2007, Oregon (Cordell et al.).

Demographic	Strata	Population (1000s)	Sample Size	Percent participating	Participants
All Groups	All people age 16+	2,905.5	1,037	22.2	644.7
Age	Under 30	706.3	210	26.3	185.4
	30-50	1,078.4	413	23.8	256.2
	51 & older	1,120.8	397	18.1	203.1
Gender	Male	1,433.6	478	26.4	378.0
	Female	1,471.9	556	18.2	266.7
Race/Ethnicity	White	2424.0	925	23.1	559.7
	Black	45.1	9	.	.
	American Indian	32.2	14	.	.
	Asian/Pacific Islander	109.4	17	.	.
	Hispanic	245.8	52	23.9	58.8
Annual Income	$25,000 or less	423.4	175	16.0	67.7
	$25,000 to $49,999	671.6	215	25.6	171.8
	$50,000 to $74,999	504.2	167	27.3	137.6
	$75,000 to $99,999	257.4	80	36.0	92.7
	$100,000 to $149,000	176.9	48	25.9	45.9
	$150,000 or more	95.2	22	.	.
Education	Less than high school	418.9	102	20.3	85.0
	High school graduate	687.3	227	24.5	168.7
	Some college/ tech school	883.7	329	26	234.3
	Bachelor's degree	390.3	218	19.5	76.2
	Post-graduate degree	196.9	142	13.3	26.1
Place of residence	Non-metropolitan	665.2	349	29.5	196.3
	Metropolitan	2,240.4	688	20.0	448.4

The data show that Oregon has a slightly higher percentage of OHV users than the Pacific region as a whole.

3.14.2. Effects Analysis

Estimated Economic Effects

Detailed information on the employment and labor income effects stemming from current recreational activities occurring on the Forest are estimated based on the expenditure of users engaged in the recreational activities on the Forest. The NVUM survey collected information regarding user spending within 50 miles of the National Forest boundary. Users reported expenditures for various activities such as groceries, restaurants, gas and lodging. The specific spending profiles and expenditures are documented in Stynes and White (2004). These expenditures are used to identify the contribution of recreation use on the Forest to the economy of the study area.

Response coefficients that identify employment and labor income effects per 1,000 recreation visits indicate the difference in various management options that could affect the amount of activity use. Therefore, the estimated employment and labor income response coefficients (employment and labor income per 1,000 party-trips) resulting from the IMPLAN input-output model for the project area was determined. The response coefficients indicate the number of full and part-time jobs and dollars of labor income per thousand visits by activity type. The response coefficients along with the visits are used to estimate the economic contribution for local and nonlocal use by activity type.

Showing employment and income response coefficients per 1000 party trips indicate that employment and income from trips in which the primary purpose was OHV use are relatively low in comparison to other activities. All of the employment and labor response coefficients for all OHV use including local day, local overnight, non-local day, non-local overnight, and non-primary are low. Non-local overnight is slightly higher than the others because people who are not local to the area and who stay overnight tend to spend more money. These tables show that OHV use has only a small effect on employment and labor income in the study area.

The table below displays the estimated employment and labor income effects for current use levels reported by NVUM for the categories of nonmotorized, motorized, nature related and all other activities by local and non-local users. These broader categories are used instead of individual activities because at the individual activity level the estimates are not statistically reliable.

The estimated economic contributions are a function of the number of visits and the dollars spent by the visitors. Nonlocal users typically spend more money per visit than local users. Activities that draw a lot of users can be responsible for more economic activity in comparison to activities that draw few users even when less money is spent per trip.

Table 3-128. Economic contribution of Mt. Hood National Forest recreation use. Employment and labor income effects by activity type (NRIS HD-NVUM 1.2 Estimates): non-motorized, motorized, nature related, and all other.

Non-Motorized		Employment Effects (full and part time jobs)			Labor Income (2008 dollars)		
		Direct	Total Secondary	Total	Direct	Total Secondary	Total
Non-Motorized	Local	136	60	196	3,312,076	2,561,598	5,688,156
	Non-local	321	135	456	7,966,169	5,712,643	13,363,814
Total Non-Motorized 1/		463	198	661	11,423,015	8,386,120	19,300,662
Motorized		**Employment Effects (full and part time jobs)**			**Labor Income (2008 dollars)**		
		Direct	**Total Secondary**	**Total**	**Direct**	**Total Secondary**	**Total**
Motorized	Local	14	6	19	333,633	252,759	570,008
	Non-local	12	5	16	272,771	203,736	463,120
Total Motorized 1/		26	11	38	638,519	480,896	1,088,079

Nature Related		Employment Effects (full and part time jobs)			Labor Income (2008 dollars)		
		Direct	Total Secondary	Total	Direct	Total Secondary	Total
Nature Related	Local	49	21	71	1,200,197	918,766	2,054,980
	Non-local	145	61	206	3,491,556	2,573,699	5,904,403
Total Nature Related 1/		202	86	288	4,888,945	3,639,832	8,295,122
All Other		**Employment Effects (full and part time jobs)**			**Labor Income (2008 dollars)**		
		Direct	**Total Secondary**	**Total**	**Direct**	**Total Secondary**	**Total**
All Other	Local	309	135	444	7,426,775	5,783,688	12,775,783
	Non-local	529	221	749	12,785,175	9,328,500	21,558,392
Total All Other 1/		849	361	1,210	20,495,672	15,331,498	34,821,595
Grand Total: All Categories		1,541	656	2,197	37,446,151	27,838,345	63,505,458

1/ Percent calculations for Totals included Non-Primary, NP.

The total direct employment from motorized use is 26 full and part-time jobs. According to the data, 14 jobs are generated by local visitors and 12 jobs are generated by non-local visitors. The total number of 2008 dollars of labor income generated from motorized use is about $1.09 million.

Individual activity categories are not discussed in detail due to the low sample size, which render the estimates not statistically reliable. Even though the results are not statistically reliable, OHV use is broken out below to give an idea of the employment and labor effects of primary purpose OHV use in the study area. The table shows that few jobs are supported by primary purpose OHV use in the study area. Expenditures associated with other primary purpose activities such as hunting and developed camping that include participation in OHV use as secondary activities are not included in these estimates. It is not possible to estimate the percentage of those expenditures associated with OHV use.

Table 3-129. Motorized use broken into OHV and other motorized categories.

Motorized		Employment Effects (full and part time jobs)			Labor Income (2008 dollars)		
		Direct	Total Secondary	Total	Direct	Total Secondary	Total
OHV Use	Local	1	0	1	18,403	14,680	31,909
	Non-local	1	0	1	21,136	17,007	36,713
Motorized	Local	13	6	18	315,230	238,079	538,098
	Non-local	11	4	15	251,635	186,730	426,407
Total Motorized 1/		26	11	38	638,519	480,896	1,088,079

1/ Percent calculations for Totals included Non-Primary, NP.

OHV Trip-Related Expenditures in Oregon

According to the *Oregon Trails 2005-2014: Motorized Trails Plan*, OHV trip-related expenditures in the state of Oregon during 1999 were estimated at $46.4 million. Oregonians made $29 million in trip expenditures, while non-resident visitors made $17.4 million in trip expenditures during the year. Nearly $27.8 million was spent in the South Coast Region. This is more than 6 times the amount of expenditures made in any other region (Oregon Trails 2005-2014: Motorized Trails Plan, p. 47 and p. 49).

OHV trip-related expenditures include: gas and oil, restaurants and taverns, food and beverages from grocery stores, hotels/motels/bed and breakfasts, camping/RV, amusements, ATV rentals, Repairs/maintenance, first aid, and other retail. These OHV trip expenditures created an additional 831 jobs and $14.6 million in personal income in Oregon (Oregon Trails 2005-2014: Motorized Trails Plan, p. 48).

In the Central Oregon region, which includes Multnomah, Clackamas, and Marion, OHV trip expenditures in 1999 were almost $3.2 million. In the Willamette Valley region, OHV trip expenditures were $3.5 million. In the table below the expenditures are divided into In-State and Out-of-State expenditures (Oregon Trails 2005-2014: Motorized Trails Plan, p. 23).

Table 3-130. OHV expenditures for in-State and out-of-state visitor contributions.

Region	In-State Expenditures	Out-of-State Expenditures	Combined Expenditures
Central Oregon	$2,537,294	$644,293	$3,181,588
Willamette Valley	$2,803,597	$711,911	$3,515,508

For all regions, about 25% of trip expenditures went toward lodging (hotels, motels, bed and breakfasts, and camping). About 18% each was spent on gas and oil restaurants, and at grocery stores. See Table: Total OHV Trip Expenditures: By Type of Purchase (Oregon Trails 2005-2014: Motorized Trails Plan, p. 48).

Table 3-131. Total OHV trip expenditures by type of purchase.

Type of Purchase	In-State	Out-of-State	Total
Gas and Oil	$5,683,405	$2,959,925	$8,643,330
Restaurants and taverns	$4,915,214	$3,446,160	$8,361,374
Food and beverages from grocery stores	$5,235,247	$2,958,407	$8,193,654
Hotels/motels/bed & break-fasts	$3,349,230	$2,046,545	$5,395,775
Camping/RV	$3,572,311	$2,510,448	$6,082,759
Amusements	$891,806	$630,858	$1,552,664
ATV rentals	$383,119	$367,521	$750,640
Repairs/maintenance	$2,481,558	$1,009,799	$3,491,357
First aid	$182,937	$113,060	$295,997
Other retail	$2,344,813	$1,330,000	$3,674,813
Total All Regions	$29,039,640	$17,372,722	$46,412,363

Annual OHV-related Expenditures in Oregon

The *Oregon Trails 2005-2014: Motorized Trails Plan* reports that Oregonians made an estimated $74 million in annual expenditures related to OHV recreation during 1999. These expenditures include OHV vehicles, OHV trailers, insurance, storage, maintenance, high performance parts, accessories, and specialty clothing. Of these annual expenditures, nearly $42.4 million was spent in the Willamette Valley region, which includes three of the study area counties as well as other several other counties. The expenditures in the Willamette Valley region were more than 5 times the amount of expenditures in any other region (Oregon Trails 2005-2014, p. 50).

Table 3-132. Total annual expenditures: by region in Oregon.

Region	Expenditures
Central Oregon	$4,231,087
Willamette Valley	$42,438,022

For all the regions, about 48% of annual expenditures went toward purchasing vehicles. About 12% were spent on maintenance, high-performance parts and trailers. These annual expenditures created an additional 978 jobs and $23.9 million in personal income in Oregon. The Willamette Valley region accounts for most of this, with 586 jobs and $15.2 million in personal income. Eastern Oregon was the least affected with 8 jobs and $167,000 in personal income (Oregon Trails 2005-2014, p. 26).

Table 3-133. Annual expenditures: income and jobs by region in Oregon.

Region	Income	Jobs
Central Oregon	$1,386,292	61
Willamette Valley	$15,216,407	586

The Oregon Trails 2005-2014: Motorized Trails Plan concludes that OHV recreation contributed an estimated $120.4 million and 1,809 jobs into Oregon's economy in 1999. OHV recreation has economic significance in both the origin and destination areas. The South Coast region is by far the most impacted with 539 jobs generated by trip expenditures. The greater proportion of overnight and out-of-state visitors to the South Coast accounts for much of this impact. OHV recreation also has a substantial economic significance in the region where people live. The Willamette Valley is where the majority of OHV riders reside. Annual expenditures on items like vehicles, parts, and maintenance take place in OHV users' home regions, accounting for 586 jobs in the Willamette Valley (Oregon Trails 2005-2014: Motorized Trails Plan p.26).

Estimated Non-Motorized Recreation Effects

Non-motorized recreational trails are stimulating tourism and recreation-related spending. Local trail users, vacationers and conference attendees provide direct economic benefits to hotels, restaurants and other businesses from increases in tourist activity and increased spending on durable goods, such as bikes, and soft goods such as gasoline, food, and drinks. This, in turn, attracts and revitalizes businesses, creates jobs, and increases public revenue (Oregon Trails 2005-2014: A Statewide Action Plan, p. 117).

Several studies have demonstrated the economic importance of non-motorized recreation on trails. For example, event associated with the Oregon Trail Sesquicentennial celebration in 1993 (coordinated by the nonprofit Oregon Trail Coordinating Council) including the "Official Oregon Trail Sesquicentennial Wagon Trail," the "Oregon Trail Fest," "Company's Coming," and "Trail's End Finale." In conjunction with these events, considerable commemorative merchandise was sold. The Council raised over 4.5 million in federal, state, and private funds estimated to have leveraged another $19.8 million in additional revenues in the form of contributions. Preliminary estimates of visitor spending generated by the Oregon Trail Center near Baker City OR recorded 672,555 visitors from May 23, 1992 through July 1994 (Oregon Trails 2005-2014: A Statewide Action Plan, p. 117).

The NVUM/IMPLAN data also show the economic importance of non-motorized recreation in the area. According to the estimated employment and labor income effects for all current recreation use reported by NVUM, together local and non-local direct full and part-time employment represents at total of 661 jobs and more than $19 million in labor income.

Non-motorized trails are also important to many communities want to attract new, expanding, or relocating businesses to their area in order to increase their employment and tax bases. The importance of quality of life is increasingly cited a major factor in corporate and business location decisions. Non-motorized trails are becoming more and more attractive to businesses and their employees, because these trail amenities play roles in increasing a community's quality of life. These improvements in quality of life may have additional employment and labor income benefits by attracting new businesses (Oregon Trails 2005-2014: A Statewide Action Plan, p. 106).

Summary of Estimated Economic Effects of OHV Use and Non-Motorized Recreation on Local Economies

Due to the small sample size in NVUM, the jobs and income estimates for OHV use, separated from other motorized use, are not statistically reliable. Therefore, it is not possible to rank the alternatives in terms of their potential economic effects on jobs and income. The available data does show that the differences in the alternatives would probably be small. Not only is it difficult to quantify differences in jobs and income from greater or fewer miles of trails, a decrease in motorized forms of recreations would likely be balanced by a commensurate increase in non-motorized forms of recreation. However, decreases or increases in estimated economic contributions to local economies are difficult to predict.

Economic Impacts of Changes in Supply and Demand

Regardless of the above economic trends, the current use for OHV participation on the Forest is about 37,547 per year. Supply outstrips current and projected participation in OHV activities for all of the action alternatives[9]. Therefore, none of the alternatives (Alternative 1 – No Action Alternative, Alternative 2 – Proposed Action, Alternative 3, and Alternative 4) is likely to cause a decline in the number of yearly OHV visits. Because the number of visitors would not change, there are no direct, indirect, or cumulative economic impacts caused by changes in supply for any of the alternatives.

Budget Trends for Road and Trail Maintenance

The final budget allocation for CMRD (construction, maintenance, and roads) and CMTL (construction, maintenance, and trails) is shown in Table 3-134. The amounts shown do not include dedicated funds, which are designated for specific projects, or the amount of each allocation that covers common costs. The amount shown was actually available for use in construction and maintenance for roads and trails.

Table 3-134. Final CMTL and CMRD budget.*

Year	Final CMTL Budget	Final CMRD
1995	Information not available	$1,783,000
1996	Information not available	$2,350,000
1997	Information not available	$4,600,000
1998	Information not available	$2,045,000
1999	Information not available	$1,806,000
2000	Information not available	$1,891,000
2001	Information not available	$2,266,000
2002	Information not available	$1,749,000
2003	$393,500	$3,169,000
2004	$289,000	$1,456,000
2005	$342,000	$1,938,000
2006	$323,000	$613,574
2007	$389,300	$1,449,500
2008	$469,900	$1,332,036
2009**	$384,000	$1,153,000

*Historical data suggests that approximately 40% of road appropriations are available for road maintenance.
**2009 budget is initial projection.

As shown in Table 3-134 above, road funding has varied from year to year. The budget is inadequate for both routine and deferred road maintenance. The result of current funding levels is the slow deterioration of the road system. In some cases, pavements would deteriorate to the point that reconstruction or routine maintenance would be more expensive. Some roads may need to be reduced to lower maintenance levels including closed.

9 Please refer to the Recreation section for a more complete discussion on Supply and Demand.

Table 3-134 does not take into account trail maintenance completed by volunteer organizations, such as the Mt. Scott Motorcycle Group, which maintains trails around McCubbins Gulch. Other volunteer groups are interested in assisting with trail maintenance if other designated locations are created. These groups include the Northern Oregon Motorcycle and ATV Club (NOMAC). Volunteer groups have the capacity to do work on trails that extends the reach of the Forest's allocated trail funds. There are no volunteer groups who do road maintenance. The Forest Service does, however, have cooperative road maintenance agreements with various counties and local road agencies. Under these agreements, the Forest can do maintenance on cooperating agencies' roads and the cooperating agencies may perform maintenance on the Forest Service road system. These trades allow the agencies to more efficiently complete their work, but they do not add miles of maintenance the way in which the volunteer trail maintenance organizations do.

Costs of Building and Maintaining Roads and Trails

The cost of implementation of each alternative was calculated for both roads and for trails by multiplying the number of miles by the cost of maintenance or the cost of conversion to trails. The costs for roads and trails are conceptual estimates. They include: ditch lining, brushing, signing, grading, routing, and mobilization. These costs were determined by Forest Service Regional Recreation Managers and Engineering Specialists.

Table 3-135. Costs of maintaining roads and building and maintaining trails for Alternative 1.

Alternative 1	Motorized Mixed Use (miles)	Roads Converted to Trails	New Trail Construction	Existing Motorized Trails	Motorized Trail Maintenance*
Miles	2,463	--	--	49	49
$ per mile	500	235	1200	850	850
Total cost per road/ trail type	1,231,500	0	0	41,650	41,650

*This number represents the total cost of maintaining roads converted to trail, new trails, and existing trails.

The cost of OHV road and trail maintenance and construction costs under Alternative 1 would be the highest with a total of $**1,273,150**.

Alternative 2 – Proposed Action

Table 3-136. Costs of maintaining roads and building and maintaining trails for Alternative 2.

Alternative 1	Motorized Mixed Use (miles)	Roads Converted to Trails	New Trail Construction	Existing Motorized Trails	Motorized Trail Maintenance*
Miles	73.2	50.5	59.3	38.1	147.9
$ per mile	500	235	1150	850	850
Total cost per road/ trail type	36,600	11,867.5	68,195	32,385	125,715

*This number represents the total cost of maintaining roads converted to trail, new trails, and existing trails.

The cost of OHV road and trail maintenance and construction costs under Alternative 2 would be the second lowest with a total of **$242,378**.

Alternative 3

Table 3-137. Costs of maintaining roads and building and maintaining trails for Alternative 3.

Alternative 1	Motorized Mixed Use (miles)	Roads Converted to Trails	New Trail Construction	Existing Motorized Trails	Motorized Trail Maintenance*
Miles	130	94	64	38	196
$ per mile	500	235	1200	850	850
Total cost per road/ trail type	64,800	22,020	76,560	32,555	166,430

*This number represents the total cost of maintaining roads converted to trail, new trails, and existing trails.

The cost of OHV road and trail maintenance under Alternative 3 would be the second highest with a total of **$329,810**.

Alternative 4

Table 3-138. Costs of maintaining roads and building and maintaining trails for Alternative 4.

Alternative 1	Motorized Mixed Use (miles)	Roads Converted to Trails	New Trail Construction	Existing Motorized Trails	Motorized Trail Maintenance*
Miles	26	33	9	28	70
$ per mile	500	235	1200	850	850
Total cost per road/ trail type	13,050	7,826	10,680	23,545	59,415

*This number represents the total cost of maintaining roads converted to trail, new trails, and existing trails.

The cost of OHV road and trail construction and maintenance under Alternative 4 would be the lowest with a total of **$90,971**.

Summary of the Costs of Building and Maintaining Roads and Trails for Alternatives

In terms of road and trail maintenance for all alternatives, the most expensive is Alternative 1 (No Action Alternative). Even with the costs of converting roads to trails and the costs of new trail construction associated with Alternatives 2,3, and 4, they all provide costs savings over Alternative 1. The second most expensive is Alternative 3, which provides a cost savings of $901,691. The second least expensive is Alternative 2, which provides a cost savings of $989,123 over the No Action Alternative. The least expensive is Alternative 4, which provides a cost savings of $1,140,530 over the No Action Alternative.

Balancing Motorized and Non-Motorized Uses

The Final Rule [Federal Register Vol. 70, No. 216 (2005)] for OHV use states that we "must strike an appropriate balance in managing all types of recreational activities." Achieving balance is an important goal of this project. The purpose of this section is to frame the concept of balance. Designating new OHV routes has the potential to alter the delicate balance between motorized and non-motorized recreation uses, thereby increasing user conflicts as designation of new OHV routes (Alternative 2-Proposed Action Alternative as well as Alternatives 3 and 4) has the potential to alter the balance between motorized and non-motorized recreation interests and uses. Motorized and non-motorized users both have concerns about their potential loss of access and loss of opportunities for desired experiences.

All of the elements discussed below are important to balancing motorized and non-motorized uses. The elements discussed in Recreation section – Adequacy of Experience, System Layout, Loop Opportunities, Diversity in Trail Difficulty, Access to Rock Creek Routes, and Safety – are also important to balancing motorized and non-motorized uses. Balance is an amalgam of all of the above elements, however, it is more than the sum of it parts. The complexity in balancing motorized and non-motorized recreation uses is a reflection of the deeply held values that contribute to attitudes and beliefs related to motorized and non-motorized recreation.

Recreation researchers often define the verb "conflict" alongside its opposite, the verb "to share." The verb "share" is generally defined as "to distribute parts of something among others, to retain part of something and give the rest or port of the rest to another or other; to take or to use a part of something with someone or something; to do or to experience something with others; to join with others; to join with others in doing or experiencing something." On the other hand, the verb "conflict" is defined by the New Webster's Dictionary as "to be at variance, clash, to struggle, or contend." Conflict can cause serious impacts to recreational experiences, to the point of causing some users to end their use and be displaced by other preemptive users. For example, when trail users fail to achieve the experiences desired from the trip and determines that it is due to someone else's behavior, conflict results, satisfaction suffers, and use patterns may change (Moore 1994).

According to recreation researchers, recreation-related conflict is asymmetrical. Many times feelings of conflict are one-way. For example, cross-country skiers dislike encountering snowmobiles, but snowmobiles are not as unhappy about encountering cross-country skiers. Likewise, hikers generally dislike encountering OHV users, but OHV users are not as unhappy about encountering hikers (Moore 1994). One OHV user comment makes this point, "There is no legitimate reason why the single-track trails in the multiple–use areas of the project should not be shared between motorized and non-motorized recreationists to a much greater extent (Comment 39.42)."

Another major source of conflict in recreation in general, and between motorized and non-motorized recreators in particular, is the difference in attitudes toward and perceptions of the environment. Users in conflict have been found to have different attitudes toward the environment (Moore 1994) and may perceive the environment differently. Some view the natural environment as an integral part of their experience. Others view the natural environment as just a setting for their activity. People who view the environment as an integral part of their recreation experience are more susceptible to conflict than those who see the environment as just a setting for their activity.

In other words, there are those OHV users who use their OHVs to enjoy the environment and there are others who use the environment to enjoy their motorized vehicles. Anecdotal evidence suggests that more OHV users fall into the latter category; they often use the environment to enjoy their OHVs. Most people who chose non-motorized forms of recreations, recreate to enjoy the environment. For example, the hikers climb to enjoy the natural environment, therefore they are more susceptible to conflict than most OHV users. An example of the relative tolerance of motorized comes from the following comment on this OHV project. "I don't see why people can't have their cake and eat it too… This area is a great escape for my family and I, and it's close enough that we don't have to spend hundreds of dollars on fuel to get there and ride (Comment 97.1).

The conflict between motorized users and non-motorized users relates to norms. Individuals and groups with different standards of behavior, social and individual norms that define what behavior is appropriate) often conflict with one another. Norms appear to be more useful than goals for predicting conflict. For example, a hiker and an OHV user may share the same goals of experiencing nature and escaping from the city but may cause conflict for one another due to different modes of acceptable behavior (Moore 1994). Many who favor non-motorized recreation voice comments similar to this one: "Motorized use is largely not compatible with traditional recreation activities, such as horse-back riding, hunting, backcountry hiking, and non-forest product collecting, and camping. People have enjoyed these traditional activities for many generations and these uses deserve respect (Comment 134.7).

There are several comments by proponents of non-motorized use about the incompatibility of motorized and non-motorized uses. One respondent wrote about: "how opportunities for quiet recreationists are profoundly affected by agency efforts to designate off-highway vehicle (OHV) routes and areas" (Comment 40.1). Another respondent wrote about his or her belief that "Motorized use is very dangerous, not just to the riders, but to other forest users (Comment 134.9)."

Motorized and non-motorized users both have expressed concerns about their potential loss of access and loss of opportunities for desired experiences. Concerns about this OHV project, however, are more complex than just the potential loss of access and loss of opportunities for desired experiences. These concerns about potential loss of access and loss of opportunity are sources of conflict. They are also the factors that make achieving balance difficult. In order to understand the conflict and the solutions to it that would assist in achieving balance, it is important to know more about the attitudes, beliefs, and values discussed above.

Attitudes toward OHV use and the designation of specific OHV use trails on National Forests reflect people's core values related to the natural environment. Understanding what values are and the differences in people's attitudes, beliefs, and values, helps explain why people have such strong support or opposition for the alternatives.

The term value has different meanings in different contexts. In general, value refers to the equivalence or worth of a thing in terms of money or goods. Or a value refers to a belief about what ought to be. Values are relatively difficult to express in words, but getting a handle on a person's values is important because it is frequently these values that influence long-term goals and decisions.

One definition of value is an enduring belief that a specific mode of conduct is socially preferable to an opposite mode of conduct. A value system is also defined as an enduring organization of beliefs concerning preferable modes of conduct or end states of existence along a continuum of relative importance. A third way of describing a value is a belief about what ought to be, what ought not to be, what is right, what is wrong. Values are relatively enduring traits that influence our thoughts (Chelladurai 2006).

Attitude is a term that is often used in conjunction with values. An attitude refers to an organization of several beliefs around a specific object or situation. A value on the other hand, refers to a single belief of a very specific kind. A value concerns a desirable mode of behavior or end-state that has transcendental quality to it, guiding actions, attitudes, judgments, and comparisons across specific objects and situations and beyond immediate goals to more ultimate goals.

There is also an important distinction between values and norms. A value refers to both end states and the means to them. And, a norm refers to only the means, which is the mode of behavior. A value is not limited to a specific situation, but a norm specifies a specific code of conduct in a specific situation. Moreover, a value is something personal and internal to the individual. A norm is a code of conduct reflecting a common understanding by the people involved in the situation (Chelladurai 2006).

In the public scoping comments, people made many comments supporting or opposing OHV use on National Forests. Some of these comments were statements reflective of deeply held values. One person wrote, "OHVs don't belong on our national forest." This person also expressed specific beliefs about OHVs. "OHVs scare wildlife, cause erosion, bring invasive weeds into native ecosystems, cause fire risk, and generally preclude the enjoyment of the forest by other users; hikers, bikers, anglers and hunters alike (Comment 90.1). This respondent believes that there should not be any OHV use on the national forests. He or she is unilaterally opposed it.

On the other hand, a proponent of OHV use wrote in a public comment: "Closing travel on our forest [is] flat wrong! The forest belongs to all of us" (Comment 137.1). This comment, like the opposite one above, "OHVs don't belong on our national forest," is a statement of belief that is reflective of different values.

Another comment that reflects an underlying value refers to the "morality of sports." The values of the person commenting are points in opposition to motorized recreation on national forests (Comment 101.1). Yet another comment refers to the belief that ATV use is "a destructive and dangerous hobby" (Comment 16.1). One respondent writes: "I find OHVs to be loud and obnoxious. They tear up the landscape and form deep scars in the land" (Comment 66.1). There are several comments expressing beliefs about the environmental effects of motorized recreation, such as, "The loss and damage of vegetation attributable to the direct and indirect impacts of OHVs, in turn, adversely affects the food and cover needs of wildlife resulting in decreasing populations" (Comment 347.46). Another belief that is in opposition to OHV use on National Forests related to the benefits of quiet recreation supporting personal renewal and health. One proponent of non-motorized expresses the following: "People need the emotional, mental and spiritual restorative qualities of wild lands. It's good medicine. The negative impacts of non-motorized activities are negligible compared to motorized recreation. Having experience on snow machines as a youth and orv's for work as an adult I don't believe these bring about the same kind of depth renewal and inspiration as non-motorized activities" (Comment #309.2).

Proponents of motorized recreation express support for the sport saying, “My family and I have experienced the privilege of motor-sport touring for many years now, and we would like to see as many opportunities remain available as possible” (Comment 23.1). Proponents of OHV use refer to it as a family sport. “There are already too little things for families to do together. If this happens, it will just have our future generations just sitting or worse yet getting into trouble because yet another right has been taken away from the people” (Comment 56.4). Another comment in support of OHV use: “please expand the OHV travel on all NF’s. Closing travel on our forests is flat wrong! The forest belongs to all of us, not just a few that have an agenda” (Comment 137.1). Others express concern over what they believe is “the continued loss of motorized recreational opportunities” (Comments 39.1 and 39.2).

This discussion of the conflicting attitudes, beliefs, values and norms related to motorized and non-motorized recreation use demonstrates the difficulty in achieving balance between motorized and non-motorized recreation activities. Both motorized and non-motorized users have concerns about their potential loss of access and loss of opportunities for desired experiences. The elements discussed in Recreation section – Adequacy of Experience, System Layout, Loop Opportunities, Diversity in Trail Difficulty, Access to Rock Creek Routes, and Safety – are all important to balancing motorized and non-motorized uses. In addition, the elements discussed below, including Supply and Demand, Noise, Irrigation Ditch Maintenance, and Emergency Services are important to balancing motorized and non-motorized uses. Achieving balance necessitates consideration of all the elements. Balance, however, it is more than the sum of these elements. The complexity in balancing motorized and non-motorized recreation uses is a reflection of the deeply held values that contribute to attitudes and beliefs about motorized and non-motorized recreation.

Effects of OHV Use Adjacent to Irrigation Ditch

The flat, open terrain adjacent to Gate Creek ditch, a quarter mile south of Sportsman’s Park, is a popular OHV riding area. Many OHV users ride along the maintenance road on the south side of the ditch. The only bridges across the ditch are on Roads 4820 and 4820140. Some OHV users drive through the ditch to access cross-country riding opportunities on the north side. The condition of the ditch at the intersection of Road 4800130 indicates that OHV users repeatedly use this point to cross. Wheel tracks lead to several other user-created trails crossing the ditch. These actions disturb the integrity of the ditch structure and accelerate the delivery of sediment into the ditch. The ditch company is concerned about increased ditch maintenance costs.

Alternative 1 – No Action

In Alternative 1, the roads and areas adjacent to Gate Creek ditch would continue to be popular OHV riding terrain. OHV use in the Forest is predicted to increase in Alternative 1, and the Gate Creek area would likely be an epicenter of increased use because of its accessibility (open pine forest with sparse understory vegetation), long riding season (relatively low elevation) and opportunities for dispersed camping near the ditch. Ditch crossing by OHVs would continue. Among the alternatives, Alternative 1 would have the highest negative effects on Gate Creek ditch.

Alternative 2 – Proposed Action

Alternative 2 proposes designating two miles of the road on the south side of Gate Creek Ditch as an OHV route. Two new bridge crossings are also proposed, one at the west end of Road 4820120 and one at the point where Road 4800130 intersects the ditch. The road bridge on 4820140 is also a proposed designated route. These three bridges and the prohibition on cross-country riding in Alternative 2 would discourage most riders from creating their own fords. Because the ditch is still exposed to OHV use, however, potential negative effects to Gate Creek ditch in Alternative 2 would be higher than in either Alternative 3 or Alternative 4, but lower than Alternative 1.

Alternative 3

In Alternative 3, the closest proposed route to Gate Creek ditch would be a third of a mile away, on the south side of Souva Creek. Cross-country riding would also be prohibited in this alternative, so OHV use would no longer be allowed in the flat, open pine stands adjacent to the ditch. These conditions would substantially reduce the risk of OHV-related damage to the ditch. Potential negative effects to Gate Creek ditch in Alternative 3 would be lower than in Alternatives 1 or 2, and similar to the effects in Alternative 4.

Alternative 4

The closest proposed designated route to Gate Creek ditch in Alternative 4 would be three miles to the west. Cross-country riding would also be prohibited in this alternative, so OHV use would no longer be allowed in the flat, open pine stands adjacent to the ditch. These conditions would substantially reduce the risk of OHV-related damage to the ditch. Potential negative effects to Gate Creek ditch in Alternative 4 would be similar to Alternative 3, lower than the effects in Alternatives 1 or 2.

Summary of Effects of OHV Use Adjacent to Irrigation Ditch

Alternative 1 is likely to cause the most damage to the irrigation ditch at Gate Creek. Under Alternative 2 the ditch would be bridged and armored to protect its structural integrity. Under Alternatives 3, there may be some unintended damage to the ditch. There is likely to be little damage to the ditch under Alternative 4.

Effects of OHV use on the Availability and Performance of Emergency Services

The public expressed concern about designating routes in the Rock Creek area and the use of emergency services. Specifically, it was stated that if routes were designated in the area and if the route designations increased the number of OHV users recreating in the area, then the volunteer service could be stretched beyond capacity. Also, concern was expressed about OHV users having accidents in areas that are difficult to reach by Type 3 ambulances, which are the only type of ambulances that the service has.[10]

Alternative 1 – No Action

In Alternative 1, all routes in the vicinity of Sportsman's Park and other private parcels near Rock Creek Reservoir would continue to be used by OHVs. Use of the Rock Creek area would likely increase under Alternative 1. Under this alternative, there may be an increase in accidents and a heavier burden on the emergency services in Wasco County.

Alternative 2 – Proposed Action

OHV use would include the lower elevation routes near Sportsman's Park, but would not provide direct access from private property to designated OHV routes. With fewer designated route miles than currently exist (39.6 miles of designated roads and trails in Alternative 2), no off-road riding, no direct access from Sportsman's Park, and no overnight use permitted around Gate Creek Ditch, OHV use of the area is predicted to decline slightly in the short term and grow less rapidly than in Alternative 1 or 3 in the long run. Therefore, there would likely be a lighter burden on the emergency services than in Alternatives 1 or 3.

Alternative 3

Alternative 3 would not permit OHV use on most of the lower elevation routes near Sportsman's Park that would be designated in Alternative 2. Alternative 3 would provide direct access from Sportsman's Park to proposed OHV routes. OHV owners (who reside in Sportsman's Park) would be permitted to enter the route system from one designated trail constructed on the boundary of the subdivision.

With one-third more designated route miles (61.2 miles in Alternative 3; 39.6 miles in Alternative 2), and with direct access from Sportsman's, Rock Creek routes would likely be more popular in Alternative 3 than in Alternative 2. However, with no off-road riding, and no overnight use permitted around gate Creek Ditch, OHV use of the area is predicted to remain level in the short term and grow less rapidly than in Alternative 1. Therefore, Alternative 3 would put a greater burden on the Wasco County Emergency Services than Alternative 2.

10 Sherry, Southern Wasco County Volunteer Ambulance Service, personal communication with Kevin Slagle on 6/1/2005 and personal communication with Elisabeth Grinspoon on 11/24/2008.

Alternative 4

Alternative 4 would not designate any OHV routes in the lower elevation area. All designated routes would be more than 3 miles west of all private parcels in the Rock Creek Area. With roughly the same number of designated route miles (37.2 miles in Alternative 4; 39.6 miles in Alternative 2), but with no direct access from Sportsman's park, no permitted use of lower elevation routes and no night riding allowed, Rock Creek routes would likely be less popular in Alternative 2 or 3. OHV use of the area is predicted to decline in the short term and grow less rapidly than the other alternatives. Therefore, this alternative would put the least burden on the Wasco County Emergency Services.

Summary of Effects of OHV use on the Availability and Performance of Emergency Services

Alternative 1 would put the greatest burden on the availability and performance of emergency services. Alternative 3 would put a greater burden on the Wasco County Emergency Services than Alternative 2. Alternative 4 would put the least burden on the Wasco County Emergency Services.

3.14.3. Environmental Justice Analysis and Civil Rights Impact Analysis

Environmental Justice

Executive Order 12898 of February 11, 1994 requires that each federal agency "shall make achieving environmental justice part of its mission by identifying and addressing… disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations."

In order to identify and address environmental justice concerns, the Executive Order 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.

In the study area for this project, several of the counties have minority populations that are greater than the state of Oregon. In Oregon, 13.6% of the population is non-white. Hood River, Jefferson, Marion, and Multnomah counties all have rates that are higher than that of the state. Four of the counties also have higher percentages of Hispanic and Latino people than the overall percentage for Oregon, which is 8% Hispanic or Latino. These counties are Hood River, Jefferson, Marion, and Wasco.

Several of the counties also have poverty rates which are higher than 12%, which is the rate for Oregon. Hood River, Jefferson, Marion, Multnomah, and Wasco all have poverty rates higher than the state. In the study area, Clackamas is the only county which has a poverty rate lower than that of the state.

The study area's disproportionately high numbers of minorities, Hispanic and Latino people, and people living in poverty, trigger an environmental justice analysis. A review of the alternatives, however, demonstrates that the economic effects are negligible for the entire population. There are no effects to jobs and income in the impact area studied and OHV use generates a small portion of the overall jobs and income, less than 1%. Therefore, the impacts are similar for the groups identified by the Environmental Justice Executive Order. In terms of social effects, none of the alternatives would have a disproportionate affect on any minority or low-income community as the travel management decisions are spread throughout the forest and do not cause any adverse environmental effect to any particular community.

Potentially affected tribes have been consulted and effects considered on their rights and concerns within the analysis of alternatives. American Indian populations would not be disproportionately impacted under any alternative with avoidance of heritage resources, consideration of traditional values, and reasonable access allowed through agreements, permits and recognition of their sovereignty and legal rights.

Several of the public comments relate to environmental justice. One respondent writes, "We believe that federal environmental justice compliance requirements as initiated by the Executive Order 12898 should be applied immediately to correct the disproportionately significant and adverse impacts that the motorized recreationists have been subject to. In order to accomplish this we request that this proposed action comply with U.S. Forest service Departmental Regulation 5600-2 (http://www.usda.gov/da/5600-2.pdf) including the DEFINITION of environmental justice provided therein" (Comment 39.52). As explained above, this EIS does comply with

Executive Order 12898. The order specifically aims to protect women, minorities, and people living in poverty. The demographic research presented the Affected Environment section of this report demonstrates that OHV users as a group do not have disproportionately high percentages of women, minorities, and people living in poverty. Therefore, OHV users do not fall into the protected category.

Civil Rights Impacts Analysis (CRIA)

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 programs.

While at least one person, who is paralyzed, commented that an OHV is the only means for him to access the Forest, this does not constitute a CRIA issue. Also, opportunities for OHV use exist under all alternatives.

3.14.4. Incomplete or Unavailable Information

Explaining the discrepancy between the data from NVUM/IMPLAN and the data presented in the Oregon Trails 2005-2014: Motorized Trails Plan is important. According to the NVUM/IMPLAN data, the total direct employment from motorized use is 26 full and part-time jobs. Of that total, 14 jobs are generated by local visitors and 12 jobs are generated by non-local visitors. The total number of 2008 dollars of labor income generated from motorized use is about $1.09 million. As noted previously, individual categories are not used above due to the low reported activity levels, which render the estimates not statistically reliable. When OHV use is broken out, however, to give an idea of the employment and labor effects of OHV use in the study area, approximately two full and part-time jobs are supported by OHV use in the study area.

On the other hand, according to the Oregon Trails 2005-2014: Motorized Trails Plan, about 586 jobs in the Willamette Valley are supported by annual expenditures on items like vehicles, parts, and maintenance. There are several explanations for this large discrepancy between the NVUM/IMPLAN expenditure data and the data reported in the Oregon Trails 2005-2014. First, the Forest Service NVUM expenditure data does not include durable goods purchases. The expenditure data only identifies purchases made for the single trip associated with the interview.[11] Second, OHV expenditure data is identified only for trips where OHV use is identified as the primary purpose. Finally, the assessment areas and the sampling of visitors are not comparable.

In addition to the expenditure and use information collected by the NVUM survey, which are important elements in the economic analysis and the bridges to the appropriate industry within the IMPLAN model by the USDA Forest Service Planning Analysis Group, more information on the economic contribution of OHV use in Oregon comes from The Oregon Trails 2005-2014: Motorized Trails Plan. Most of the economic information in the Oregon Trails 2005-2014 comes from the "1999 Oregon Off-Highway Vehicle User Survey." The data presented below from the survey present a picture of the contribution of OHV use to the Oregon economy that is quite different from the picture that comes from the Forest Service NVUM and IMPLAN data. The analysis from the survey estimates that OHV recreation contributed an estimated $120 million and 1,809 jobs to Oregon's economy in 1999 (Oregon Trails 2005-2014: Motorized Trails Plan, p.46).

The Oregon Trails 2005-2014: Motorized Trails Plan divides Oregon into eight regions. They are: South Coast, Central Oregon, North Coast, Willamette Valley, Eastern Oregon, Northeastern Oregon, Southern Oregon, and Central Coast. The six counties of the Mt. Hood study area fall into two different regions: Willamette Valley and Central Oregon. The Willamette Valley region includes Multnomah, Clackamas, and Marion, which are part of the study area. The Willamette Valley region also includes Linn, and parts of Lane and Douglas, which are not part of the study area. The other counties in the study area are located in the region that the Oregon Trails Report calls the Central Oregon region. It includes Hood River, Wasco, and Jefferson counties. There are five other counties that are not part of the study area that are also part of the Central Oregon region: Sherman, Gilliam, Wheeler, Deschutes, and Crook.

11 The Forest Service is careful not to include durable goods purchases, but only the annual costs or retail margins. Including the entire value of the machines and other durable good inflates the values, because the goods depreciate over time. In addition, the manufacturing process often takes place elsewhere. Only the retail sale takes place in the study area.

Because the two regions, Central Oregon and Willamette Valley, include counties that are in the study area, as well as counties that are outside of the study area, determining the exact value of the trip expenditures in the study area from the Oregon Trails Report is difficult. The Report does, however, give a general idea of the value of OHV related recreation in the study area (Oregon Trails 2005-2014: Motorized Trails Plan, p. 46).

3.15. Other Required Disclosures

3.15.1. Adverse Environmental Effects that Cannot be Avoided

Implementation of any action alternative would cause some adverse environmental effects that cannot be effectively mitigated or avoided. Unavoidable adverse effects often result from managing the land for one resource at the expense of the use or condition of other resources. Most adverse effects can be reduced, mitigated or avoided by limiting the extent or duration of effects. The application of Forest Plan standards and guidelines, Best Management Practices, PDC, and monitoring are all intended to further limit the extent, severity, and duration of potential effects. Such measures are discussed throughout Chapter 3 and the purpose of this section is to fully disclose these effects.

Table 3-139 below summarizes the unavoidable potential adverse effects to the environment associated with the action alternatives considered in this EIS.

Table 3-139. Adverse effects that cannot be avoided for proposed OHV systems for Alternatives 2, 3 and 4.

Unavoidable Adverse Effect	Reference	Descriptions of Effects	Forest Service Intended Response and Rationale
Noise (also see disturbance to wildlife)	Section 3.1 and 3.14	The sound of OHVs in a wildland setting is one of the most common and virulent complaints voiced by those who visit the forest for a "quiet" recreation experience. For some, the sound of motorized vehicles is an irreconcilable factor that makes sharing the same space with OHVs unacceptable. These conflicting attitudes are most acutely felt on trails constructed and maintained for non-motorized use, in developed recreation sites, and in wilderness areas.	Alternative design and PDC (Section 2.3) aimed at focusing use to particular areas and eliminating cross-country travel would reduce the amount of noise from OHVs as well as reduce the conflict between non-motorized and motorized recreational users.
Sedimentation	Section 3.3	Currently, there are some specific locations where sedimentation is occurring. These locations are substantially lower in any of the action alternatives compared to the No Action Alternative, even without the PDC in place. Although sedimentation is lower, it would continue to occur with OHV use on native surface roads and trails.	Alternative design and PDC (Section 2.3) aimed at focusing use to particular areas and eliminating cross-country travel would reduce the amount of sedimentation.
Fugitive Dust	Section 3.12	OHV use on native surface roads and trails will create dust during the dry months of the year (June – September).	Alternative design and PDC (Section 2.3) aimed at focusing use to particular areas and eliminating cross-country travel would reduce the amount of dust and the widespread occurrence of the dust.

Table 3-141. (continued)

Unavoidable Adverse Effect	Reference	Descriptions of Effects	Forest Service Intended Response and Rationale
Disturbance to wildlife, including noise	Section 3.5	Wildlife, including deer, elk, and nesting birds, can be harassed by human presence and noise from vehicles. This can result in reduced survival and reproduction or loss of young when the adult animal flees the disturbance. The critical period for wintering animals is December 1 to March 31. The critical period for elk calving is May 15 to June 21. The critical period for deer fawning is May 25 to July 15. There could be some loss of fawns, calves and fledgling birds from OHV use in the route vicinities.	The incorporation of seasonal closures for the different alternatives focuses on known key areas for wintering and rearing areas. The seasonal closures would protect 90% of the elk calving and 70% of the deer fawning in these areas. It would also protect areas where deer and elk are known to winter. These closures would benefit many nesting birds. Some losses from harassment would still occur. Seasonal closures offer a compromise between recreational opportunities and wildlife production.
Effects to heritage resources	Section 3.8	Proposed new trail construction would require excavation and grading resulting in disturbance (adverse effect) to pre-contact archaeological site 663NA319.	PDC (Section 2.3) include archaeological data recovery as a mitigation measure to lessen adverse effect. Data recovery effort would be focused on area of construction impact.
Increase in potential accident probability and severity due to mixed use.	Section 3.11	Crash probability and severity would be medium to high on most proposed OHV routes. Crash probability and severity are most affected by vehicle(s) speed, visibility, and operator behavior.	PDC (Section 2.3) are proposed to lower crash probability and severity. On most routes it is estimated that crash probability and severity may be lowered from high to medium or from medium to low, with implementation of PDC. PDC would not eliminate crashes, or reduce injuries to zero.
Effects of OHV use on botanical species.	Section 3.6	There is some risk that native plants may be injured and/or killed by OHVs. OHVs may impact plants by crushing, trampling, or breaking vegetation. Additionally, some plants may be harmed by vehicle emissions. There is also some risk that native plants may be adversely impacted by invasive plant species. Any species along trails and roads would be threatened by not only the direct impacts of OHVs, but also by any invasive plants that are transported to the designated route systems. Adverse impacts would most likely be localized to the OHV system.	The adverse effects would be minimized by planting native plants in areas impacted. Also, adverse effects would be minimized by managing routes and staging areas according to the Mt. Hood Site Specific Invasive Plant Treatment Record of Decision and Final Impact Statement (2005). PDC in Section 2.3 focuses on botany resources.

3.15.2. Short-term Uses and Maintenance of 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 continued unmanaged and inappropriate OHV use on the Forest would result in long-term adverse effects on a broad range of resources, reducing the long-term productivity of the National Forest System lands. Unmanaged and inappropriate OHV use, particularly cross-country travel, threaten ecosystem sustainability, including: trampling native and species botanical species; harassing wildlife species and reducing the functionality of habitat and forage for wildlife and livestock; increasing soil erosion and reducing water quality; eliminating of long-term riparian area function; and, trampling heritage resources. Unmanaged and inappropriate OHV use also increases the risks associated with motorized mixed-use roads, which can lead to increased accidents between licensed vehicles and OHVs. Lastly, unmanaged and inappropriate OHV use can lead to increased user-conflicts between motorized and non-motorized users. These problems would continue to increase as the popularity of OHV use grows and more users come to the Forest. The cost of implemented a managed OHV system on the Forest and mitigating previous damage would continue to increase as the damage associated with unmanaged and inappropriate OHV use continues.

The relationship between uses and long-term productivity as it relates to OHV use is described throughout this EIS, primarily in each of the resource areas discussed in Chapter 3. Chapter 3 discusses the relationship between land management activities and OHV use, as well as describes the effects of the proposed OHV routes on the resources.

3.15.3. Irreversible or Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of 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.

Implementation of any of the action alternatives would not produce irreversible or irretrievable commitment of resources. All of the alternatives propose OHV routes by class of vehicle and time of year as required by the Final Travel Management Rule. Also, all of the alternatives would be implemented within the constraints of the PDC described in Section 2.3, and other national and regional management direction (which incorporate applicable laws, regulations, and policies). Adverse effects of new trail construction described in Chapter 3 are likely to be localized and short-term. Adverse effects associated with OHV use described in Chapter 3 are likely to be long-term; however, the effects of implementing any action alternatives are substantially lower than continuing with the No Action Alternative.

3.15.4. Cumulative Effects

Cumulative effects are addressed in each of the resource areas discussed in Chapter 3. Incremental impacts of the environment from multiple actions over time are assessed for each of the Forest resources.

3.15.5. Conflicts with Plans or Policies of Other Jurisdictions

NEPA at 40 CRF 1502.25(a) directs "to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with . . . other environmental review lands and executive orders."

Based on information received during scoping, informal consultation meetings, and analysis in the EIS, none of the alternative under consideration would conflict with the plans or policies of other jurisdictions, including the Confederated Tribes of Warm Springs. This project would not conflict with any other policies and regulations or laws, including the Safe Drinking Water Act, Clean Water Act, Endangered Species Act, Magnuson-Stevens Fishery Conservation and Management Act, Wild and Scenic Rivers Act, Wilderness Act, and National Historic Preservation

Act. Refer to the following sections for discussions regarding these laws:

- Section 3.4 Water Quality – Safe Drinking Water and Clean Water Acts;
- Section 3.5 Fisheries and 3.6 Wildlife – Endangered Species Act;
- Section 3.5 Fisheries – Magnuson-Stevens Fishery Conservation and Management Act;
- Section 3.14 Congressionally Designated Areas – Wild and Scenic Rivers and Wilderness Acts; and,
- Section 3.9 Heritage Resources – National Historic Preservation Act.

3.15.6. Effects on Consumers, Civil Rights, Minority Groups, Women and Environmental Justice

Executive Order #12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, directs Federal agencies to address effects accruing in a disproportionate way to minority and low income populations. Section 3.14.3 Civil Rights and Environmental Justice discusses the impacts of this project on these groups.

Additionally, in accordance with Forest Service and BLM policy, contracting procedures would ensure that projects made available to contractors would be advertised and awarded in a manner that give proper consideration to minority and women-owned business groups.

3.15.7. Effects on American Indian Rights

No impacts on American Indian social, economic or subsistence rights are anticipated. No impacts are anticipated related to the American Indian Religious Freedom Act. The Confederated Tribes of Warm Springs, Confederated Tribes of Grand Ronde and Confederated Tibes of Siletz have historic interests in this area and have been contacted in reference to this Proposed Action and environmental analysis, as discussed in Section 4.4 Consultation with Tribal Governments.

3.15.8. Prime Farmlands, Rangelands, Forestlands, or Parklands

No prime farmlands, rangelands, forestlands or parklands exist within the project area. Since none of these lands exist, there would be no direct, indirect or cumulative effects would occur.

3.15.9. Wetlands and Floodplains

Floodplains are areas within the riparian areas of Class 1, 2, and 3 streams, and vary from only a few feet, to the entire riparian area in width. Wetlands are areas that regularly are saturated by surface or ground water and subsequently are characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions. Proposed OHV routes within riparian areas are discussed in Sections 3.3 Water Quality and 3.4 Fisheries.

The environmental effects are consistent with the standards and guidelines for the Mt. Hood National Forest Land and Resource Management Plan (as amended) (see Appendix D). No adverse effects are anticipated to occur to wetlands and floodplains with any action alternative.

3.16. Forest Plan Amendment

Alternatives 2, 3 and 4 in this EIS propose an amendment to the Mt. Hood National Forest Land and Resource Management Plan (Forest Plan). The Forest Plan Amendment #17 for all alternatives includes change to 20 of the standards and guidelines in the Forest Plan. The proposed changes are described in Table 2-13. In addition, Alternative 2 includes six additional changes to standards and guidelines for Research Natural Areas, Special Interest Area, Special Old Growth, Special Emphasis Watershed, and Key Site Riparian. Alternative 3 includes the two of these additional changes for the Special Interest Areas and Key Site Riparian. Alternative 4 does not include any of these additional changes. These proposed changes are described in Table 2-14 for Alternative 2 and Table 2-22 for Alternative 3. Also, the Forest Plan Amendment replaces the Monitoring Plan for Off-Road Vehicles Use found on pages 5-69 to 5-70 in the Forest Plan with the Monitoring Framework presented in Chapter 2, Section 2.5. This Forest Plan Amendment, if approved, would be effective at the time of the decision and would apply to the respective management areas throughout the Forest.

The regulations for forest planning under the National Forest Management Act (36 CFR Part 219, as of July 1999) provide procedures for the Responsible Officials to amend a Forest Plan. The regulations state: "If the change resulting from the amendment is determined not to be significant for the purposes of the planning process, the Forest Supervisor may implement the amendment following appropriate public notification and satisfactory completion of NEPA procedures" (36 CFR 219.10(f)). The proposal to amend the Forest Plan was described in a scoping notice mailed to the public in August 2007. Analysis of these proposed changes is included in this EIS.

Additional guidance on amending Forest Plans is provided in the Forest Service Manual 1900-Planning (January 31, 2006). Section 1926.51 describes non significant amendments as:

- Actions that do not significantly alter the multiple-use goals and objectives for long-term land and resource management;
- Adjustments of management area boundaries or management prescriptions resulting form further on-site analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long-term land and resource management;
- Minor changes in standards and guidelines; and/or,
- Opportunities for additional management practices that would contribute to achievement of the management prescriptions.

The proposed amendment does not propose changes in management area boundaries or prescriptions, but does represent minor changes in standards and guidelines and provides for additional management practices that would bring the Forest Plan into compliance with the 2005 Final Travel Management Rule.

The proposed minor changes to the standards and guidelines A4-038, B1-077, B1-078, B1-079, B3-038, B11-037, C1-041, and C1-042 limits OHV use to designated routes and prohibits cross-country travel. Only designated routes would be available for OHV use; all other roads and trails in the Land Use Allocations would be closed to OHV use, unless additional NEPA analysis is completed. The proposed minor changes to the standards and guidelines A3-006, A3-007, B1-082, B1-083, B5-001, and B5-002 replaces the enforcement tool to the Motor Vehicle Use Map and no longer requires areas or roads closed to OHV use to be posted. The proposed minor changes for standards and guidelines A4-039, A7-024, A9-039, B6-036 and B6-037 allow OHV to continue using existing roads and trails; no new OHV trail construction or cross-country travel would be permitted. All proposed changes are in accordance with the Final Travel Management Rule (Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule [Federal Register, Vol. 70, pgs. 68264-68291]).

None of these changes would alter any of the multiple use goals or objectives and current management activities outlined in the Forest Plan for Research Natural Areas (A3), Special Interest Areas (A4), Special Old Growth (A7), Key Site Riparian (A9), Wild Scenic and Recreational Rivers (B1), Roaded Recreation (B3), Pileated Woodpecker/ Pine Martin Habitat Area (B5), Special Emphasis Watershed (B6) Deer and Elk Summer Range (B11), and Timber Emphasis (C1). To the extent that OHVs may adversely affect the multiple use goals of these management areas, however, limiting OHVs to the designated routes and prohibiting cross-country travel would contribute to achieving multiple use goals.

The minor change to the Forestwide standard and guidelines (FW-447, FW-459, FW-465) would not change the overall intent of the standard, it just clarifies that OHV use would be limited to designated routes and cross-country travel would be prohibited. The minor change to the Forestwide standard and guidelines (FW-413, FW-483, FW-543) would not change the overall intent of the standard, it just replaces the enforcement tool to the Motor Vehicle Use Map and no longer requires areas or roads closed to OHV use to be posted. Therefore, there would be no change in the multiple use goals of protecting transportation, dispersed recreation, or wild and scenic rivers across the Forest.

Lastly, the Monitoring Plan for Off-Road Vehicles is updated with the Monitoring Framework to reflect the intent of the Final Travel Management rule. Completing the EIS provides a Forestwide analysis of the OHV opportunities across the Forest as directed by two of the items in the Monitoring Plan. The remaining item focuses on balance which is included in the Monitoring Framework. As such, the new Monitoring Framework does not change the overall intent of the Monitoring Plan.

The Northwest Forest Plan (NWFP) requires that amendments to Forest Plans "be reviewed by the Regional Interagency Executive Committee [REIC] to assure consistency with the objectives of these standards and guidelines" (NWFP, page E-18). Forest Plan amendments that do not impact NWFP Standards and Guidelines do not require REIC review. Appendix D lists all of the applicable NWFP Standards and Guidelines for this project. All of these standards and guidelines are analyzed in Chapter 3 of this EIS, and none of standards and guidelines requires an amendment as part of this project. All the requirements for the riparian reserves are met through all the action alternatives, as required by the project design criteria and analyzed in Section 3.7 Aquatic Conservation Strategy. Project design criteria W-6, W-7, and W-8 explicitly address trail construction, cross-country trail, and stream crossings within riparian reserves. As such, the Forest Plan Amendment only proposes changes to the Mt. Hood National Forest Land and Resource Management Plan and does not propose any changes to any other plans, including the Northwest Forest Plan.

Chapter 4 - Consultation and Coordination

4.0. Consultation and Coordination

4.1. Consultation with U.S. Fish and Wildlife Service (FWS)

Formal consultation is required with FWS for disturbance of Northern spotted owls (*Strix occidentalis caurina*) for this project. Consultation with the FWS for disturbance will be completed prior to signing the Record of Decision. The effects determination from disturbance for several of the known sites is *May Affect and are Likely to Adversely Affect* northern spotted owls due to the proximity of the roads and trails to the known spotted owl nest sites. Effects to Critical Habitat are *May Affect, Not Likely to Adversely Affect* due to the potential loss of snags from danger tree removal. Snags are a primary constituent element but the amount of loss would be extremely low from a habitat standpoint. The effects call for habitat modification for this project is *May Affect, Not Likely to Adversely Affect* the northern spotted owl or its habitat. Formal consultation on this project is expected to begin in July 2009.

In addition, early involvement with FWS was conducted in regard to listed bull trout and their habitat that occur within or near the proposed OHV routes. FWS provided input on the location of designated OHV routes in the Peavine and Graham Pass locations. The input was incorporated into the alternative development process. Alternatives 2, 3 and 4 have a *no effect* determination for bull trout (*Salvelinus confluentus*). As such, no consultation would be required for this project for bull trout.

4.2. Consultation with National Marine Fisheries Service (NOAA Fisheries)

Early involvement with NOAA fisheries was conducted in regard to listed anadromous fish species and their habitat that occur within or near the proposed OHV routes. Alternative 2 has an effects determination of *may affect, not likely to adversely affect* for Lower Columbia River steelhead (*Oncorhynchus mykiss*) and critical habitat due to sedimentation and OHV route stream crossing. Alternative 3 has an effects determination of may *affect, not likely to adversely affect* for Lower Columbia River coho *(Oncorhynchus kisutch)*, Middle Columbia River steelhead (*Oncorhynchus mykiss*) and critical habitat due to sedimentation and OHV route stream crossing. If either of these alternatives is selected, consultation will be required and must be completed prior to signing the Record of Decision. Consultation on this project is expected to begin in June 2009.

4.3. Consultation with Oregon State Historic Preservation Office (SHPO)

The National Historic Preservation Act of 1966 requires consideration be given to the potential effect of federal undertakings on historic resources. This includes historic and prehistoric cultural resource sites. The guidelines for assessing effects and for consultation are provided in 36 CFR 800. To implement these guidelines, Heritage Resource Survey Reports will be completed for each OHV location where OHV routes are designated and submitted to the SHPO prior to the release of the Final Environmental Impact Statement. Informal consultation was conducted with SHPO on defining Area of Potential Effects (APE), site armoring, and project design criteria.

4.4. Consultation with Tribal Governments

Government-to-government consultation was conducted with the Confederated Tribes of Warm Springs (CTWS). A quarterly coordination meeting is held between tribal authorities of CTWS and line officers with Forest Service and Bureau of Land Management. Meetings were held in March, May and September 2008 as well as June 2009. The status of the OHV project was discussed between government officials at these meetings. In addition, the Forest Service coordinated with the CTWS, Confederated Tribes of Grand Ronde, and Confederated Tribes of Siletz at the staff level, as summarized below.

Interdisciplinary teams from the Forest and CTWS met to discuss the proposed action, alternatives, and project design features. The Tribe expressed concern about the routes designated in the Peavine under Alternative 2 (Proposed Action). The Forest IDT incorporated their suggestions and re-routing trails in the development of Alternative 3 and 4 for the Peavine location. Tribal representatives also expressed concerns related to trespassing, law enforcement, wildlife (deer and elk habitat), water quality, and increased fire hazard. The two teams discussed these issues and incorporated the comments and suggestions from the CTWS into the alternative design and project design criteria.

In addition to meetings with the two interdisciplinary teams, heritage and cultural resources specialists from the Forest and each of the three tribes met to discuss the proposed action, and the impacts this project would have on heritage resources. The Forest Archeologist has met on several other occasions with members of the CTWS and Grande Rhonde to discuss the project in more detail. Also, the Forest Archeologist shared the Heritage Resource Specialist Report and project design criteria with representatives from the CTWS and Grand Ronde. Government-to-government consultation with all three tribes will continue throughout the planning process.

4.5. Consultation with Federal, State, and County Governments

Coordination has occurred with Bureau of Land Management, Oregon Parks and Recreation Department, Oregon Department of Fish & Wildlife, Oregon Department of Forestry, as well as Clackamas, Hood River, Multnomah and Wasco counties.

The Forest coordinated with the Salem District of the Bureau of Land Management when considering whether or not to incorporate a designated Hillock Burn OHV route system into the proposed action. This proposed OHV route system is along the Forest Service Road 45 system on the Clackamas River Ranger District. Current OHV users travel between the National Forest System and BLM lands through interconnecting roads. BLM will be preparing to begin OHV planning on its lands in the near future. The Forest and BLM decided to postpone designating any OHV routes in this area until that time.

The Forest received a grant from Oregon Parks and Recreation Department in 2004 to develop a preliminary proposal for OHV routes on Mt. Hood National Forest and to conduct preliminary effects analysis. Also, the Forest received a grant in 2005 to conduct a feasibility study of the proposed OHV routes. This preliminary proposal was used to develop the proposed action analyzed in this EIS. Recreation specialists have continued to coordinate with Oregon Parks and Recreation Department throughout the process, and their input has been incorporated into the alternative development process.

- When the Forest was developing the preliminary proposal, the Forest met with Oregon Department of Forestry to discuss the designated OHV route system at Tillamook State Forest. The Forest discussed the successes and challenges associated with designating OHV trails in Douglas-fir forest on the westside of the Cascades.

- The Forest Wildlife Biologist coordinated with Oregon Department of Fish and Wildlife (ODF&W) to identify areas of concern where deer and elk winter and summer range overlapped proposed designated OHV systems. These areas of concerns were used to develop the proposed seasonal closures. In addition, the project design criteria were shared with ODF&W and their input was incorporated.

- Each District Ranger met with the Board of County Commissioners in their county to discuss the proposed action. This included Clackamas, Hood River, Wasco and Multnomah counties. In addition, the Barlow District Ranger met on numerous occasions with Wasco County Court to discuss the designated OHV system in the Rock Creek area. Alternative 3 analyzed in this EIS was a collaborative effort by Wasco County, Sportsman's Park residents, and the Forest Service. Lastly, the Recreation Assistant at Hood River Ranger District discussed the proposed routes and potential connections with county OHV systems with Hood River County. These connections were incorporated into Alternative 3 for the Gibson Prairie and Mount Defiance locations.

Chapter 5 - List of Preparers

5.0. List of Preparers

The following is a list of contributors to this EIS. Numerous other Forest Service employees contributed to the completion of this document through their assistance in review and support functions, and/or by providing US Forest Service level data and other information needs. Their help was greatly appreciated and recognized. The members and roles of the interdisciplinary team are listed below and short biographies follow for each person.

Role	IDT Member
Project Coordinator / Recreation Specialist	Malcolm Hamilton
IDT Leader / NEPA Specialists	Jennie O'Connor Card
Writer/Editor	Michelle Lombardo
Soil Scientist	John Dodd
Hydrologist / Air Quality Specialist	Mark Kreiter
Fish Biologist	Gary Asbridge / Tracii Hickman
Wildlife Biologist	Alan Dyck
Botanist / Invasive Species	Lance Holmberg
Heritage Resource Specialist	Rick McClure
Law Enforcement Officer	Frank Aguilar
Fire Specialist	Scott MacDonald
Roads Engineer	Serena Helvey
Motorized Mixed Use Specialist	Stewart Fletcher
Social Scientist	Elisabeth Grinspoon
GIS Specialist	Kim Vieira

Frank Aguilar. Law Enforcement Officer, US Forest Service, Mt. Hood National Forest, Zigzag Ranger District, Zigzag, Oregon. Experience: Law Enforcement Officer for eight years; worked as an OHV Manager and Assistant Recreation Planner with the Forest Service for seven years.

Gary Asbridge. Fisheries Biologist, US Forest Service, Mt. Hood National Forest, Hood River Ranger District, Parkdale, Oregon. Education: B.S. in Biology, Zoology emphasis; M.S. in Fishery Resources. Experience: Barlow Ranger District fisheries biologist for 4 years, Barlow and Hood River Ranger Districts fisheries program manager for 15 years. Fisheries technical support and analysis for a wide variety of Forest projects, including timber sales, silviculture, watershed restoration, road building/management, and recreation, as well as the design and implementation of watershed restoration projects and fish population/habitat surveys.

John Dodd. Soil Scientist, US Forest Service, Mt. Hood National Forest, Barlow Ranger District, Dufur, Oregon. Education: B.S. in Soil Science, Land Use Emphasis. Experience: Provide technical soils information to managers to assist in making informed decisions. Types of projects information has been provided for include timber sales, ski area management, other recreation-related, grazing allotments, engineering, on and off-Forest small and large scale restoration projects through local watershed councils, irrigation districts, local municipal watersheds, etc. Monitoring projects for implementation and effectiveness. Experience with the US Forest Service since June of 1988, 20 of those years on the Mt. Hood National Forest.

Alan Dyck. Wildlife Biologist, US Forest Service, Mt. Hood National Forest**,** Sandy, Oregon. Education: B.S. in Wildlife Management – Humboldt State University. Experience: Nine years as Forest Wildlife Biologist on the Mt. Hood National Forest; three years as a Wildlife Biologist with the USDA Natural Resource Conservation Service; nine years as Wildlife Administrator for the US Army at Fort Pickett; and an additional seven years as a biological technician for the Army, USDA Forest Service, and Fish and Wildlife Service. Worked in a variety of jobs dealing with fish and wildlife habitat and population management on public and private lands. Recent experience in analyzing the effects of Forest projects on wildlife habitat and management.

Stewart Fletcher. Civil Engineer, US Forest Service, Mt. Hood, Willamette and Siuslaw National Forests and Columbia River Gorge National Scenic Area, Hood River Ranger District, Parkdale, Oregon. Education: B.S. in Forest Engineering 1981 – Michigan Technological University. Experience: 28 years working in various positions in road and bridge survey, design, construction, maintenance, inspection and program management in Alaska, Washington and Oregon. Designated: qualified engineer to perform engineering analysis of motorized mixed use proposals, 9/10/2007.

Elisabeth Grinspoon. Social Scientist, US Forest Service, Pacific Northwest Region, Portland, Oregon. Education: B.A. in East Asian Studies; Master of Forestry; Ph.D. in Environmental Science, Policy, and Management. Experience: Participatory Rural Appraisal Specialist with United Nations Volunteers, Consultant to Food and Agriculture Organization of the United Nations, Program Specialist and Social Scientist with the US Forest Service since 2002

Malcolm Hamilton. Recreation Program Manager, US Forest Service, Mt. Hood National Forest, Sandy, Oregon. Education: B.S. in Forest Resource Management, and graduate studies in silviculture and forest ecology. Experience: 34 years in silviculture and recreation management with National Forests in Oregon, California, and Arizona.

Serena Helvey. Roads Engineer, Project Development, USDA Forest Service, Mt. Hood National Forest, Clackamas River Ranger District, Estacada, Oregon/Sub region Engineering Member(Mt. Hood/Siuslaw/Willamette N.F.). Education: A.A.S. in Civil Engineering, A.A.S. in Forestry, Certificate in Natural Resources. Experience: One season as a Wildlife Technician, Three season as a Timber Pre-sale Technician, Two years experience in the Engineering and Road Management Department. Road decommissioning projects, road maintenance design work.

Tracii Hickman. Fish Biologist and Willamette Fish Level 1 team representative, USDA Forest Service, Mt. Hood National Forest, Walla Walla, Washington (telecommuter). Education: B.A. in Biology – Lewis and Clark College with graduate work in Fisheries – Oregon State University. Experience: Project effects assessments, watershed restoration and ESA consultation with the USDA Forest Service since 1988; five years with the Forest Service Pacific Northwest Research Station in Juneau Alaska and Corvallis Oregon as a fisheries technician monitoring habitat use by anadromous fish.

Lance Holmberg. Botanist, US Forest Service, Mt. Hood National Forest, Barlow Ranger District, Dufur, Oregon. Education: M.A. in Biology with botany emphasis from Humboldt State University (1969), B.S. in Natural Resources from Humboldt State University (1967), and an A.A. in Forestry from Fullerton Community College (1965). Experience: 17 years as botanist for the forest service on Bear Springs and Barlow Districts. Taxa expert on bryophytes.

Mark Kreiter. Hydrologist, US Forest Service, Columbia River Gorge National Scenic Area and Mt. Hood National Forest, Hood River, Oregon. Education: B.S. and graduate work in Geology, A.A.S. in Water Resources. Experience: Project effects assessments, watershed restoration and monitoring with the US Forest Service since 1989.

Michelle Lombardo. Natural Resource Planner, USDA Forest Service, Mt. Hood National Forest, Sandy, Oregon. Education: B.S. in Natural Science, emphasis in Geology; M.S. in Geography, emphasis in Natural Resource Management. Experience: Forest Plan implementation and NEPA coordination and writing with the Forest Service since 2005.

Scott MacDonald. Assistant Fire Management Officer, US Forest Service, Mt. Hood National Forest, Barlow Ranger District, Dufur, Oregon. Education: Graduated in 2003 from the Technical Fire Management program, and is currently a qualified TFLD, STEN, RXB2, FALC, WHSP, and a trainee DIVS & ICT3 with the NW Oregon Type 2 team. Experience: Began with the Forest Service in 1985, working in fire/fuels management on the Goosenest Ranger District, Klamath National Forest, and continued in fire suppression on engines and hand crews thru 1990. In 1991, moved to the Winema National Forest, Chiloquin Ranger District, as an Engine Boss, and spent 13 years as a Engine Supervisor and as a Crew Boss for type 2 crews; also worked as an Ignition specialist, Prescribed fire Burn Boss, and as a Fuels specialist for Interdisciplinary Teams. From 2000 thru 2003 used fire behavior skills for local Type 3 incidents as a Type 3 Fire Behavior Specialist. In 2004, became the AFMO and has served as the Fire/Fuels specialist on three Wildlife Urban Interface Fuel Reduction Project teams in that time.

Rick McClure. Archaeologist/Heritage Program Manager, US Forest Service, Mt. Hood and Gifford Pinchot National Forests, Mt. Adams Ranger District, Trout Lake, Washington. Education: B.A. with Anthropology specialty, The Evergreen State College; M.A. in Anthropology, Washington State University. Experience: Contract archaeologist, 3 years; District Archaeologist, Gifford Pinchot National Forest, 10 years; Forest Archaeologist, Gifford Pinchot National Forest, 13 years; Forest Archaeologist, Gifford Pinchot and Mt. Hood National Forest (combined) 5 years.

Jennie O'Connor Card. Natural Resource Planner, US Forest Service, Mt. Hood National Forest, Hood River Ranger District, Parkdale, Oregon. Education: B.A. in Biological Basis of Behavior and Environmental Studies; Master of Environmental Management, emphasis in Resource Ecology; Master of Forestry, emphasis in Silviculture – Duke University. Experience: Forest Plan implementation, National Environmental Policy Act (NEPA) coordination and writing, Freedom of Information Act (FOIA), and Forest Management with the Forest Service since 2001.

Kim Vieira. GIS Services Specialist, Data Resources Management, US Forest Service, Pacific Northwest Region, Portland, Oregon. Education: High School Diploma. Experience: Engineering Tech – Fremont NF 1980 to 1981. Engineering Tech: Mt. Hood National Forest 1981 to 1991. Engineering Tech: Umpqua NF 1991 to 1994. GIS and Computer Specialist: Umpqua National Forest 1994 to 2000. GIS Trainer: R6 Information Resource Management 2000 to 2004. R6 Data Resource Management GIS Data Services Specialist: Located at the R6 Regional Office 2004 to Present. Fully qualified GIS for incidents. Major Incidents: Tiller Complex Fire - 2002, Space Shuttle Columbia Recovery Incident - 2003, Florida Hurricanes – Charley, Francis, Ivan and Jean 2004.

Chapter 6 -
Distribution List of Draft EIS

6.0. Distribution List of Draft EIS

This Draft Environmental Impact Statement will be distributed to individuals and organizations that responded throughout this process, as well as Federal agencies, federally recognized tribes, State and local governments, and key partners. These organizations and agencies are listed below. Also, the mailing list includes over 500 individuals that are not listed here. The complete mailing list is maintained in the project record, available at the Mt. Hood National Forest Headquarters Office in Sandy, Oregon.

American Hiking Society
American Motorcycle Association
ANPO
ATV-Ride
Backcountry Horsemen
Bark
BlueRibbon Coalition
Bob Lamphere's Beaverton/Honda
Bureau of Land Management
CAMBA
Center for Biological Diversity
Clackamas River Basin Council
Clackamas River Water
Columbia Gorge Off-Road Association
Columbia Gorge Power Sledding
Confederated Tribes of the Warm Springs
Discover Bicycles
Dodge Logging
Emerald Trail Riders Association, Inc.
Fir Mountain Timber LLC
Forest Service Employees for Environmental Ethics
Friends of Mount Hood
Fun County Power Sports
Gifford Pinchot Task Force
Gorge Free Riders Association
Grassvalley RV Park
Gresham's Honda
Hood River County Board of Commissioners
Hood River County Forestry Department
Hood River County Planning Department
KB Trees, LLC
Longhaven II Joint Venture
Longview Fibre Company
Mazamas
METRO
Mid-Columbia Fire and Rescue
Middle Fork Irrigation District
Morrow County Grain Growers Kamasaki
Morrow County Public Works
Mt. Hood Chapter, Pacific Crest Trail Association
Mt. Hood Community College
Mt. Hood Polaris
Mt. Hood Snowmobile Club
Mt. Hood Study Group
Mt. Scott Motorcycle Club
Mt. View Cycles
Mule Deer Foundation
National Oceanic and Atmospheric Administration Fisheries

Northern Oregon Motorcycle & ATV Club
Northwest Motorcycle Association
NW Quadriders
Oak Lodge Water District
Oregon Department of Environmental Quality
Oregon Department of Fish & Wildlife
Oregon Department of Forestry
Oregon Equestrian Trails
Oregon Hunters Association
Oregon Motorcycle Riders Association, Inc.
Oregon Parks & Recreation Department
Oregon Wild
Pacific Crest Trail Association
Pacific Legal Foundation
Pacific Northwest 4-Wheel Drive Association
Port Blakely Tree Farms
Portland State University
Portland United Mountain Pedalers (PUMP)
REI
Rock Creek District Improvement Co.
Rocky Mountain Elk Foundation
Scott Water District
SDS Lumber Company
Sierra Club
South Fork Water Board
Sportsman Park Community Association
The City of Mosier
The City of The Dalles Watershed
The Dalles Watershed Council
The Wilderness Society
U.S. Fish and Wildlife Service
Warren Industries
Wasco County Board of Commissioners
Wasco County Soil & Water Conservation District
West Side Fire District
Western Law Environmental Law Center

References

References

Abbot, Henry L. 1857. *Report of Lieut. Henry L. Abbot Upon Explorations for a Railroad Route from Sacramento Valley to the Columbia River.* Washington, D.C.

Albright, Del. 2008. What to Do in this Trying Economy. [Web Page]. Located at: http://www.sharetrails.org/magazine/article.php?id=1636. Accessed on: October 2008.

Aldridge, D. W., B. S. Payne, and A. C. Miller. 1987. The effects of intermittent exposure to suspended solids and turbulence on three species of freshwater mussels. Environmental Pollution 45:17-28.

Anderson, Hal E. 1982. Aids to Determining Fuel Models for Estimating Fire Behavior. GTR-INT-122. U.S. Department of Agriculture, Forest Service, Intermountain Research Station. Ogden, Utah.

Arora, D. 1986. *Mushrooms Demystified*. Berkeley: Ten Speed Press.

Asbridge, G. M., A. McKinney, and J. Schreck. 2001. Fish passage at road crossings assessment. Project Completion Report 1999-2001, Mt. Hood National Forest, Sandy, Oregon.

Aukerman, R., and W. T. Springer. 1976. Effect of recreation on water quality in wildlands. Eisenhower Consortium Bulletin 2. National Technical Information Service, Springfield, VA.

Baxter, Greg. 2002. All Terrain Vehicles as a Cause of Fire Ignition in Alberta Forests, *Advantage* 3: 44. Wildland Fire Operations Research Centre.

Baxter, Greg. 2004. Evaluating the Fire Ignition Potential of all Terrain Vehicles in Alberta Forests. Advantage 5: 08. Wildland Fire Operations Research Group.

Behnke, R. J. 1992. Native trout of western North America. American Fisheries Society Monograph 6.

Bergerson, Terry, et al. 2005. Oregon Trails 2005-2014: A Statewide Action Plan. [Web Page]. Located at: http://egov.oregon.gov/ORPD/PLANS/trailsplanning.shtml. Accessed on: October 2008.

Bjornn, T. C., and D. W. Reiser. 1991. Habitat requirements of salmonids in streams. American Fisheries Society Special Publication 19: 83-138.

Bjornn, T. C., and seven coauthors. 1974. Sediment in streams and its effects on aquatic life. University of Idaho, Water Resources Research Institute, Research Technical Completion Report Project B-025-IDA, Moscow.

Bjornn, T. C., and six coauthors. 1977. Transport of granitic sediment in streams and its effects on insects and fish. University of Idaho, College of Forestry, Wildlife and Range Sciences, Bulletin 17, Moscow.

Brodo, I.M., S.D. Sharnoff, and S. Sharnoff. 2001. *Lichens of North America*. New Haven: Yale University Press.

Bursell, Neal. 2008. Personal communication. President, Northern Oregon Motorcycle and ATV Club and Resident at Sportsman's Park, Oregon. (10 October 2008).

Burtchard, Greg C. 1994. *The Posy Archaeological Project: Upland Use of the Central Cascades, Mt. Hood National Forest*. Report submitted to Mt. Hood National Forest. Laboratory of Archaeology and Anthropology, Portland State University, Portland, Oregon.

Burtchard, Greg and Robert Keeler. 1991. *Mt. Hood Cultural Resource Reevaluation Project.* Report prepared under contract to Mt. Hood National Forest. Laboratory of Archaeology and Anthropology, Portland State University.

Burtchard, Greg C., Dennis R. Werth, and Sandra L. Snyder. 1993. *Clackamas Wild and Scenic River Cultural Resource Inventory Project, Mt. Hood National Forest*. International Archaeological Research Institute, Inc. Honolulu.

Bustard, D. R., and D. W. Narver. 1975. Preferences of juvenile coho salmon (*Oncorhynchus kisutch*) and cutthroat trout (*Salmo clarki*) relative to simulated alteration of winter habitat. Journal of Fisheries Research Board of Canada 32:681-687.

Calvin, D.; Luther, T.; Eden, M.; Herb, G.; Fiedler, P.; Zalunardo, D.; Holbrook, J. 1991. Cascade Crest Elk Telemetry Study. Unpublished report. The Confederated Tribes of the Warm Springs.

Canfield, J.E.; Lyon, L.J.; Hillis, J.M.; Thompson, M.J. 1999. Ungulates. In: Joslin, G.; Youmans, H., coords. Effects of recreation on Rocky Mountain wildlife: a review for Montana. Helena, MT: Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society: 6.1–6.25.

Carlton, Don. 2003. Crowning and Extreme Fire Behavior Beyond Rothermel 101. Technical Fire Management 18, Module III, Lesson Plan.

Cassier, E.F.; Freddy, D.J.; Ables, E.D. 1992. Elk responses to disturbance by cross country skiers in Yellowstone National Park. *Wildlife Society Bulletin*. 20(4): 375–381.

Castellano, M.A., J.E. Smith, T.O'Dell, E. Cazares, and S. Nugent. 1999. *Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan.* U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, General Technical Report, PNW-GTR-476.

Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. *Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan.* U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, General Technical Report, PNW-GTR-572.

Caulk, Grady. 1994. Cultural Resource Site Report, 662NA93, Hawke Eye Site. U.S. Department of Agriculture, Forest Service, Mt. Hood National Forest. Sandy, Oregon.

Chelladurai, Packianathan. Human Resource Management in Sport and Recreation, Champaign, Illinois: Human Kinetics, 2006.

Cline, L. D., R. A. Short, and J. V. Ward. 1982. The influence of highway construction on the macroinvertebrates and epilithic algae of a high mountain stream. Hydrobiologia 96: 149-159.

Coffin, B. 2009. Personal communication. Hydrologist. Gifford Pinchot National Forest, Trout Lake, WA.

Cordell, H. Ken, Carter J. Betz, Gary T. Green, and Becky Stephens. 2008. Off-Highway Vehicle Recreation in the United States and its Regions and States: A National Report from the National Survey on Recreation and the Environment (NSRE). [Web Page]. Located at: http://warnell.forestry.uga.edu/nrrt/nsre/IrisReports.html. Accessed on: October 2008.

Cordell, H. Ken, Carter J. Betz, Gary T. Green, and Shela H. Mou. 2008. Outdoor Recreation Activity Trends: What's Growing, What's Slowing? [Web Page]. Located at: http://warnell.forestry.uga.edu/nrrt/nsre/IrisReports.html. Accessed on: October 2008.

Crabtree, D. M. 2004. Effects of petroleum and various industrial and automotive organic compounds on fishes, with particular reference to salmonid fishes in fresh water and paved parking lot runoff. Umatilla National Forest, Walla Walla, Washington. 15 pp.

Crimmins, Tom M. Management Guidelines for OHV Recreation. 2006. [Web Page]. Located at: http://www.NOHVCC.org/education/tools.asp. Accessed on: October 2008.

Csuti, B., A. J. Kimerling, T. A. O'Neil, M. M. Shaughnessy, E. P. Gaines and M. M. P. Huso. 1997. Atlas of Oregon wildlife: distribution, habitat and natural history. Oregon State University Press, Corvallis, OR. 492 pp.

Culp, J. M., S. J. Walde, and R. W. Davies. 1983. Relative importance of substrate particle size and detritus of stream benthic macroinvertebrate microdistribution. Canadian Journal of Fisheries and Aquatic Sciences 40:1568-1574.

Currens, K.P., C.B. Schreck, and H.W. Li. 1990. Allozyme and morphological divergence of rainbow trout (*Oncorhynchus mykiss*) above and below waterfalls in the Deschutes River, Oregon. Copeia 3:730-746.

DeWalt, R. E., and J. H. Olive. 1988. Effects of eroding glacial silt on the benthic insects of Silver Creek, Portage County, Ohio. Ohio Journal of Science 88:154-159.

Dietrich, P., and G. Mulamoottil. 1974. Does recreational use of reservoirs impair water quality? Water Pollution Control 112:16-18.

Dodd, J. 2008. Personal communication. Soil Scientist. Mt. Hood National Forest. Dufur, Oregon.

Elliot, W. J., R. B. Foltz, and M. D. Remboldt. 1994. Predicting sedimentation from roads at stream crossings with the WEPP model. Paper No. 947511. Presented at the 1994 ASAE International Winter Meeting. St. Joseph, MI.

Elliot, W. J., R. B. Foltz, and C. H. Luce. 1995. Validation of the water erosion prediction project (WEPP) model for low-volume forest roads. Proceedings of the Sixth International Conference on Low-Volume Roads, pp. 178-186. Washington D.C.: Transportation Research Board.

Everest, F. H., R. L. Beschta, J. C. Scrivener, K. V. Koski, J. R. Sedell, and C. J. Cederholm. 1987. Fine sediment and salmonid production: a paradox. Pages 98-142 *in* Salo and Cundy (1987).

English, Donald B.K., Susan M. Kocis and Derek P. Hales. 2004. Off-Highway Vehicle Use on National Forests: Volume and Characteristics of Visitors. U.S. Department of Agriculture, Forest Service, Southern Research Station. Athens, GA.

FEMAT (Forest Ecosystem Management Assessment Team). 1993. Forest ecosystem management: an ecological, economic, and social assessment. Report of the Forest Ecosystem Management Assessment Team. [Web Page]. Located at: http://pnwin.nbii.gov/nwfp/FEMAT/PDF/. Accessed 2004 Jul.

Ferguson, M.A.D.; Keith, L.B. 1982. Influence of Nordic skiing on distribution of moose and elk in Elk Island National Park, Alberta. *Canadian Field-Naturalist*. 96(1): 69–78.

Forest Concepts L1910. Long-Strand Erosion Control Material from Forest and Urban Wood. Federal Way, Washington.

Forsman, E. D., R. G. Anthony, and C. J. Zabel. 2004. Distribution and abundance of red tree voles in Oregon based on occurrence in pellets of northern spotted owls. *Northwest Science*. 78: 294-302.

Freddy, D.J.; Bronaugh, W.M.; Fowler, M.C. 1986. Responses of mule deer to disturbance by persons afoot and snowmobiles. *Wildlife Society Bulletin*. 14(1): 63–68.

French, R. A. 2006. Personal communication. District Fish Biologist. Oregon Department of Fish and Wildlife. The Dalles, Oregon.

French, Kathrine, Yvonne Hajda, Robert Moore, and David Ellis. 1995. *An Ethnographic Study of Mt. Hood National Forest, Oregon.* Archaeological Investigations Northwest, Inc. Report No. 86.

French, David and Kathrine French. 1998. Wasco, Wishram, and Cascades. In *Handbook of North American Indians, Volume 12, Plateau*. Ed. Deward E. Walker, Jr., pp. 360-377. Smithsonian Institution, Washington.

Furnish, J.L., and R.W. Monthey. 1998. Draft management recommendations for ROD mollusk species associated with springs and spring runs: *Fluminicola* new species 2, 3, 11, 19; *Vorticifex* new species 1, *Vorticifex klamathensis sinitsini*; *Juga (Oreobasis)* new species 2; and *Lyogyrus* new species 1 and 3. v. 2.0

Gaines, William L.; Singleton, Peter H.; Ross, Roger C. 2003. Assessing the cumulative effects of linear recreation routes on wildlife habitats on the Okanogan and Wenatchee National Forests. Gen. Tech. Rep. PNW-GTR-586. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 79 p.

Gardner, John. 2007. ATV Market Share by DSM by County. Personal communication. (12 September 2007). Owner, Polaris Dealership, Boring, Oregon.

Gilbert, Barrie. 2007. Thrill Craft; The Environmental Consequences of Motorized Recreation. Foundation for Deep Ecology. Chelsea Green Publishing Company.

Hall, T. J. 1986. A laboratory study of the effects of fine sediments on survival of three species of Pacific salmon from eyed egg to fry emergence. National Council of the Paper Industry for Air and Stream Improvement, Technical Bulletin 482, New York.

Hanes, Richard. 2008. Travel Management and the National Historic Preservation Act. Draft document dated 2/1/08, U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Portland, Oregon.

Hernandez, Sharon K. 2009. Personal Communication. Wildlife Biologist. US Forest Service, Mt. Hood National Forest, Clackamas River Ranger District. Estacada, Oregon. (6 January 2009).

Hillman, T. W., J. S. Griffith, and W. S. Platts. 1987. Summer and winter habitat selection by juvenile chinook salmon in a highly sedimented Idaho stream. Transactions of the American Fisheries Society 116:185-195.

Hitchcock, C.L. and A. Cronquist. 1987. *Flora of the Pacific Northwest.* Seattle: University of Washington Press.

Hood River Soil and Water Conservation District. 2004. Hood River Subbasin Plan. Northwest Power Planning Council, Portland, Oregon.

Hood River Soil and Water Conservation District (SWCD). 1999. Hood River Watershed Assessment. Hood River Watershed Group. Hood River. Oregon.

Horn, Jonathon C. 1987. Bingham's Camp: Historical Archaeology of an 1890s Eastern Oregon Logging Camp. Unpublished Master's thesis, Department of Anthropology, University of Idaho.

Howes, Steve. 1979. Soil Resource Inventory, Mt. Hood National Forest. Mt. Hood National Forest. Sandy, Oregon.

Hunn, Eugene and David S. French. 1998. Western Columbia River Sahaptins. In *Handbook of North American Indians, Volume 12, Plateau*. Ed. Deward E. Walker, Jr., pp. 439-445. Smithsonian Institution, Washington.

ICBEMP. 2000. Interior Columbia Basin Ecosystem Management Project. U.S. Department of Agriculture, Forest Service and U.S. Department of the Interior, Bureau of Land Management.

Johnson, B.K.; Kern, J.W.; Wisdom, M.J. [et al.]. 2000. Resource selection and spatial separation of mule deer and elk during spring. *Journal of Wildlife Management*. 64(3): 685–697.

Kocis, Susan M., Donald B.K. English, et al. 2004. National Visitor Monitoring Results: Mt. Hood National Forest. US Forest Service. [Web Page]. Located at: http://www.fs.fed.us/recreation/programs/nvum/. Accessed on: March 2009.

Kohl, Keith. 2007. Personal Communication. Wildlife Biologist, Oregon Department of Fish and Wildlife. The Dalles, Oregon. (30 October 2007).

Kresek, Ray. 1984. *Fire Lookouts of the Northwest*. Ye Galleon Press, Fairfield, Washington.

Lawton, E. 1971. *Moss flora of the Pacific Northwest*. Nichinan, Japan: Hattori Botanical Laboratory.

Lee, R. D., J. M. Symons, and G. G. Robeck. 1970. Watershed – human use and water quality. Journal of the American Water Works Association 62:412-422.

Leslie, D.M.; Douglas, C.L. 1980. Human disturbance at water sources of desert bighorn sheep. *Wildlife Society Bulletin*. 8(4): 284–290.

MacArthur, R.A.; Geist, V.; Johnston, R.H. 1982. Cardiac and behavioral responses of mountain sheep to human disturbance. *Journal of Wildlife Management*. 46(2): 351–358.

Malone, Mike. 2009. Personal Communication. Natural Resource Planner. US Forest Service, Mt. Hood National Forest, Zigzag Ranger District. Zigzag, Oregon. (5 January 2009).

McCain, C. and N. Diaz. 2002. *Field Guide to the Forested Plant Associations of the Westside Central Cascades of Northwest Oregon.* U.S. Department of Agriculture, Forest Service. Technical Paper R6-NR-ECOL-TP-02-02.

McClelland, W. T., and M. A. Brusven. 1980. Effects of sedimentation on the behavior and distribution of riffle insects in a laboratory stream. Aquatic Insects 2: 161-169.

McCune, B. and L. Geiser. 1997. *Macrolichens of the Pacific Northwest*. Corvallis: Oregon State University Press.

McLeay, D. J., A. J. Knox, J. G. Malick, I. K. Birtwell, G. Hartman, and G. L. Ennis. 1983. Effects on Arctic grayling (*Thymallus arcticus*) of short-term exposure to Yukon placer mining sediments: laboratory and field studies. Canadian Technical Report of Fisheries and Aquatic Sciences 1171.

McNeil, W. J., and W. H. Ahnell. 1964. Success of pink salmon spawning relative to size of spawning bed materials. U. S. Fish and Wildlife Service Special Scientific Report Fisheries 469.

Moore, R.L. 1994. Conflicts on multiple-use trails: Synthesis of the literature and state of the practice, Report No. FHWA-PD-94-031. Washington, D.C.: Federal Highway Administration.

Murdock, George Peter. 1938. Notes on the Tenino, Molala, and Paiute of Oregon. *American Anthropologist* 40:395-402.

Musser, Lloyd. 1984. Documented chronological History of the Clear Lake-Juniper Flat Irrigation Project. U.S. Department of Agriculture, Forest Service, Heritage Program, Mt. Hood National Forest. Sandy, Oregon.

Myers, J. M., R. G. Kope, G. J. Bryant, D. Teel, L. J. Lierheimer, T. C. Wainwright, W. S. Grant, F. W. Waknitz, K. Neely, S. T. Lindley, and R. S. Waples. 1998. Status review of chinook salmon from Washington, Idaho, Oregon, and California. United States Department of Commerce, National Oceanic and Atmospheric Administration: 443.

Naylor, Leslie M., M. J. Wisdom, R.G. Anthony. 2009. Behavioral Responses of North American Elk to Recreational Activity. Journal of Wildlife Management 73(3):328–338; 2009.

NMFS (National Marine Fisheries Service). 2007. Biological and conference opinion for fish habitat restoration activities in Oregon and Washington, CY2007-CY2012. P/NWR/2006/06530. NMFS, Northwest Region, Portland, Oregon.

NMFS. 2008. Proposed middle Columbia River steelhead distinct population segment ESA recovery plan. NMFS, Northwest Region, Portland, Oregon.

Oregon Heritage Information Center. 2007. Rare, Threatened and Endangered Species of Oregon. [Webpage]. Located at: http://oregonstate.edu/ornhic/. Accessed on: March 2007.

Oregon Museum of Science and Industry (OMSI). 2005. Dangerous Decibels Teachers Resource Guide. [Web Page]. Located at: http://www.dangerousdecibels.org. Accessed on: October 2008.

Oregon State Legislature. 2007. Oregon Revised Statute, Chapter 821. [Web Page]. Located at: http://www.leg.state.or.us/ors/821.html. Accessed on: October 2008.

Oregon State Parks. 2008. The Official Handbook of OHV Oregon Laws and Rules: What YOU Need to Know. [Web Page]. Located at: http://www.oregonOHV.org. Accessed on: October 2008.

Oetting, Albert C. 2004. *Archaeological Investigations for the Portland General Electric Clackamas River Hydroelectric Project, Clackamas County, Oregon, Volume 1: Project Overview*. Heritage Research Associates Report No. 263.

Papouchis, C.M.; Singer, F.J.; Sloan, W.B. 2001. Responses of desert bighorn sheep to increased human recreation. *Journal of Wildlife Management*. 65(3): 573–582.

Paton, J.A. 1999. *The liverwort flora of the British Isles*. Essex, UK: Harley.

Paullin, Pamela K. 2007. Boring to the Core: The Archaeology, History, and Dendrochronology of a Railroad Logging Camp, LaDee Flat, Clackamas County, Oregon. Unpublished MA Thesis, Department of Anthropology, Oregon State University.

Pedersen, R.J. 1981? Management and Impacts of Roads in Relation to Elk Populations. Oregon Chapter of The Wildlife Society Proceedings. 169-173 (file copy from Westfornet).

Rampp, B., C. Dillian, D. Ball, D. Beard, and J. Liddle. 1997. Cultural Resources Site Report, 661EA259, Clear Creek Irrigation System Ditch. Report prepared for Mt. Hood National Forest, Northwest Archaeological Associates, Inc., Seattle.

Reese, Jeff. 2006. Personal Communication. Forester. US Forest Service, Mt. Hood National Forest. Sandy, Oregon. (November 2006).

Reiser, D. W., and R. G. White.1988. Effects of two sediment size-classes on survival of steelhead and chinook salmon eggs. North American Journal of Fisheries Management 8:432-437.

Riedel, M. S. 2006. Quantifying trail erosion and sedimentation with sediment tracers. Second Interagency Conference on Research in the Watersheds, May 16-18, 2006. 9 pp.

Roden, Jim. 2008. Personal Communication. Timber Sale Planner. US Forest Service, Mt. Hood National Forest, Clackamas River Ranger District. Estacada, Oregon. (12 December 2008).

Rothermel, Richard C. 1983 How to Predict the Spread and Intensity of Forest and Range Fires. U.S. Department of Agriculture, Forest Service. General Technical Report INT-143. Intermountain Forest and Range Experimental Station. Ogden, Utah.

Rowland, M.M.; Wisdom, M.J.; Johnson, B.K.; Kie, J.G. 2000. Elk distribution and modeling in relation to roads. *Journal of Wildlife Management*. 64(3): 672–684.

Rutherford, J. E., and R. J. Mackay. 1986. Patterns of pupal mortality in field populations of *Hydropsyche* and *Cheumatopsyche* (Trichoptera, Hydropsychidae). Freshwater Biology 16:337-350.

Salo, E. O., and T. W. Cundy, editors. 1987. Streamside management: forestry and fishery interactions. University of Washington, Institute of Forest Resources Contribution 57, Seattle.

Schneider, Ingrid E. and Tony Schoenecker. 2006. All-terrain Vehicles in Minnesota: Economic impact and consumer profile. [Web Page]. Located at: http://www.tourism.umn.edu. Accessed on: October 2008.

Scott, Joe H. and Elizabeth D. Reinhardt. 2005. Standard Fire Behavior Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model. U.S. Department of Agriculture, Forest Service. RMRS-GTR-153. Rocky Mountain Research Station. Fort Collins, Colorado.

Sengpielaudio. 2008. Sound Pressure Level and Sound Pressure. [Web Page]. Located at: http://www.sengpielaudio.com/calculator-distance.htm. Accessed on: October 2008.

Shepp, D. L. 1996. Petroleum hydrocarbon concentrations observed in runoff from discrete, urbanized automotive-intensive land uses. www.epa.gov/owowwtrl/watershed/Proceed/sess1-20.pdf

Sheridan, W. L., and W. J. McNeil. 1968. Some effects of logging on two salmon streams in Alaska. Journal of Forestry 66:128-133.

Shively, D., C. Allen, T. Alsbury, B. Bergamini, B. Goehring, T. Horning, and B. Strobel. 2007. Clackamas River bull trout reintroduction feasibility assessment. Published by USDA Forest Service, Mt. Hood National Forest; U.S. Fish and Wildlife Service, Oregon State Office; and Oregon Department of Fish and Wildlife, North Willamette Region. December, 2007.

Sigler, J. W., T. C. Bjornn, and F. H. Everest. 1984. Effects of chronic turbidity on density and growth of steelheads and coho salmon. Transactions of the American Fisheries Society 113:142-150.

Slider, Terry. 2007. Recreation Facility Analysis: Supply, Current Use and Future Demand. Powerpoint Presentation. U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. Portland, Oregon.

Smith, Patricia D. 2001. Archaeological Investigations at the Borrow Pit Site, Mount Hood National Forest, Oregon. Unpublished MA Thesis, Department of Anthropology, University of Montana.

State of Oregon. 2008. Driver and Motor Vehicle Services, Department of Transportation, Oregon Vehicle Laws, 801.305. Salem, Oregon.

State of Oregon. 2009. Oregon Blue Book County Profiles. [Webpage]. Located at: http://bluebook.state.or.us/local/counties/counties.htm. Accessed on: January 2009.

Stokowski, Patricia A., and Christopher B. LaPointe. 2000. Environmental and Social Effects of ATVs and ORVs: An Annotated Bibliography and Research Assessment. Burlington VT: School of Natural Resources, University of Vermont.

Stynes, Daniel J and Eric M. White. 2004. Spending Profiles of National Forest Visitors, 2002 Update, September 2004. [Webpage]. Located at: http://fsweb.ftcol.wo.fs.fed.us/imi/imi_implan_center_Reading.htm. Accessed on: January 2009.

Switalski, T. Adam and Allison Jones. 2008. Best Management Practices for Off-road Vehicle Use on Forestlands, A Guide for Designating and Managing Off-Road Vehicle Routes. [Web Page]. Located at: http://www.wildlandscpr.org. Accessed on: October 2008.

Tagart, J. V. 1984. Coho salmon survival from egg deposition to fry emergence. Pages 173-182 *in* J. M. Walton and D. B. Houston, editors. Proceedings of the Olympic Wild Fish Conference. Peninsula College, Port Angeles, Washington.

Tsui, P. T. P., and P. J. McCart. 1981. Effects of stream-crossing by a pipeline on the benthic macroinvertebrate communities of a small mountain stream. Hydrobiologia 79:271-276.

Tysdal, L. M., W. J. Elliot, C. H. Luce, and T. A. Black. 1999. Modeling erosion from insloping low-volume roads with WEPP watershed model. Transportation Research Record. Washington, D.C.: Transportation Research Board, National Research Council 2(1652):250-256.

U.S. Department of Agriculture, Forest Service. 1923. Mount Hood National Forest Range Appraisal 1923.

U.S. Department of Agriculture, Forest Service. 1982. Plant Association and Management Guide for the Pacific silver fir Zone – Mt. Hood and Willamette National Forests.

U.S. Department of Agriculture, Forest Service. 1986a. Plant Association and Management Guide for the Western Hemlock Zone – Mt. Hood National Forest. R6-ECOL-232A-1986.

U.S. Department of Agriculture. Forest Service. 1986b. Recreational Opportunity Spectrum Book.

U.S. Department of Agriculture. Forest Service. 1988. General Water Quality Best Management Practices. Pacific Northwest Region. Oregon.

U.S. Department of Agriculture. Forest Service. 1990a. Final Environmental Impact Statement: Land and Resource Management Plan. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1990b. Land and Resource Management Plan: Mt. Hood National Forest. As amended. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1990c. Record of Decision: Land and Resource Management Plan. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1994a. Fish Creek Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1994b. Mile Creeks Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1995a. Collawash/Hot Springs Watershed Analysis. Revised 2003. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1995b. Eagle Creek Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1995c. White River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1995c. Salmon River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1995d. Salmon River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1995e. Upper Clackamas River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1995f. White River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1995g. Upper Clackamas River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1995h. Zigzag River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1996a. Clackamas River – Oak Grove Fork Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1996a. East Fork Hood River and Middle Fork Hood River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1996b. Lower Clackamas River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1996c. North Fork Clackamas River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1996d. Roaring River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1996d. Upper Sandy Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1996e. Upper Sandy Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1996f. West Fork of Hood River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1997a. Bull Run River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1997b. Olallie Lake Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service. 1997c. South Fork of Clackamas River Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture. Forest Service.1997d. Surveyor's Ridge LSR Assessment. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture, Forest Service and U.S. Department of Interior, Bureau of Land Management. 1998. North Willamette LSR Assessment. Oregon.

U.S. Department of Agriculture. Forest Service. 2000. Mill Creek Watershed Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture, Forest Service. 2003. Roads Analysis. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture, 2005. Preventing and Managing Invasive Plants – Final Environmental Impact Statement (FEIS). R6-NR-FHP-PR-02-05, Vol.1. Pacific Northwest Region, Invasive Plant Program. Portland, Oregon.

U.S. Department of Agriculture, Forest Service. 2008. Site-Specific Invasive Plant Treatments for Mt. Hood National Forest and Columbia River Gorge National Scenic Area in Oregon, including Forest Plan Amendment #16 Record of Decision and Final Environmental Impact Statement. Mt. Hood National Forest. Oregon.

U.S. Department of Agriculture, Forest Service. 2006. Mt. Hood National Forest Strategic Stewardship Plan: Weaving Together the Environment, People and the Economy. Mt. Hood National Forest. As amended. Mt. Hood National Forest. Oregon.

U. S. Department of Agriculture, Forest Service. 2007a. US Forest Service Handbook, Travel Planning handbook. 7709. Washington Office. Washington D.C.

U.S. Department of Agriculture, Forest Service. 2007b. US Forest Service Policy for Section 106 of the NHPA Compliance in Travel Management: Designated Routes for Motor Vehicle Use.

U. S. Department of Agriculture, Forest Service. 2008. Final Environmental Impact Statement (FEIS) Eldorado National Forest Public Wheeled Motorized Travel Management. Eldorado National Forest. Placerville, CA.

U. S. Department of Agriculture, Forest Service. 2009. Forest Service Engineering Manual, 7700-30. Washington Office. Washington D.C.

U.S. Department of Agriculture, Forest Service and U.S. Department of Interior, Bureau of Land Management. 1994. Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. Oregon, Washington and Northern California.

U.S. Department of Agriculture, Forest Service and U.S. Department of Interior, Bureau of Land Management. 2001. Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines. Oregon, Washington and Northern California.

U.S. Department of Agriculture, Forest Service and U.S. Department of Interior, Bureau of Land Management. 2004. Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines. Oregon, Washington and Northern California.

U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). 1999. Noxious, Invasive, and Alien Plant Species: A Challenge in Wetland Restoration & Enhancement. [Web Page]. Located at: http://www.pwrc.usgs.gov/WLI/wris1.htm. Accessed 27 April 2006.

U.S. Department of Commerce, National Oceanic & Atmospheric Administration (NOAA). 2003. Endangered Species Act – Section 7 Consultation Biological Opinion and Magnuson-Steven Fishery Conservation and Management Act Essential Fish Habitat Consultation. Control of Knotweed on Bureau of Land management-Administered Lands, Sandy River Basin, Multnomah and Clackamas Counties, Oregon. USDI BLM, Salem District. NOAA National Marine Fisheries Service, Northwest Region. August 18, 2003.

U.S. Department of Interior, Bureau of Land Management-Instruction Memorandum No. OR-2006-027, February 8, 2006. Expires 9/30/2007.

U.S. Department of Interior, Fish and Wildlife Service (FWS). 2005. Biological Opinion, Concurrence, and Conference Report on the Effects to 23 Species and 4 Critical Habitats from the U.S. Forest Service Pacific Northwest Regional Invasive Plant Program. (USFWS Reference Number 1-7-05-7-0653).

U.S. Department of Interior, Fish and Wildlife Service. 2008. Final Recovery Plan for the Northern Spotted Owl, *Strix occidentalis caurina*. U.S. Fish and Wildlife Service, Portland, Oregon. xii + 142 pp.

U. S. Fish and Wildlife Service (USFWS). 2002. Bull trout (*Salvelinus confluentus*) draft recovery plan. USFWS, Region 1, Portland, Oregon.

USFWS. 2007. Biological opinion and letter on concurrence for programmatic aquatic habitat restoration activities in Oregon and Washington that affect ESA-listed fish, wildlife, and plant species and their critical habitats. 8330.F0055(07), TS Number 07-516, TAILS Number 13420-2007-F-0055. USFWS, Region 1, Portland, Oregon.

Varness, K. J., R. E. Pacha, and R. F. Lapen. 1978. Effects of dispersed recreational activities on the microbiological quality of forest surface water. Applied and Environmental Microbiology 36(1):95-104.

Wagenet, R. J., and C. H. Lawrence. 1974. Recreational effects on bacteriological quality of impounded water supply. Journal of Environmental Health 37:16-20.

Wasco County Soil and Water Conservation District (SWCD). 2002. Mosier Watershed Assessment. The Dalles. Oregon.

Waters, T.F. 1995. Sediment in streams: sources, biological effects, and control. American Fisheries Society Monograph 7.

Winthrop, Robert H., Kathryn R. Winthrop, and Dennis J. Gray. 1995. *Rock Feature Sites on the Mt. Hood National Forest: An Inventory and Evaluation. Volume 1: Report*. Cultural Solutions, Ashland.

Witmer, G. W. and D.S. deCalesta. 1985. Effect of Forest roads on habitat use by Roosevelt elk. *Northwest Science* 59 (2): 122-125.

Wrightson, Jim. 2008. Personal Communications. Fire Planner. US Forest Service, Mt. Hood National Forest. Sandy, Oregon.

Wydoski, R.S., and R.L. Whitney. 2003. Inland fishes of Washington. Second edition. University of Washington Press, Seattle, Washington.

Zenk, Henry B. and Bruce Rigsby. 1998. Molala. In *Handbook of North American Indians, Volume 12, Plateau*. Editor: Deward E.

Glossary

GLOSSARY

Adaptive Management - A continuing process of action-based planning, monitoring, researching, evaluating, and adjusting with the objective of improving implementation and achieving the goals of the standards and guidelines.

Administrative Unit - A National Forest, a National Grassland, a purchase unit, a land utilization project, Columbia River Gorge National Scenic Area, Land Between the Lakes, Lake Tahoe Basin Management Unit, Midewin National Tallgrass Prairie, or other comparable unit of the National Forest System.

Administratively Withdrawn Areas (AWA) - Areas removed from the suitable timber base through agency direction and land management plans.

Air Quality – The composition of air with respect to quantities of pollution therein; used most frequently in connection with standards of maximum acceptable pollutant concentrations.

Affected Environment - Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as the result of a proposed human action.

Alluvial - Relating to clay, silt, sand, gravel, or similar detrital material deposited by flowing water. Alluvial deposits may occur after a heavy rain storm.

All-terrain Vehicles (ATV) – All vehicles intended for off-highway use to be All-terrain Vehicles (ATVs). ATVs are broken into three classes as follows:

Class I ATV (quads, 3-wheelers)
- Vehicles 50-inches 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

(See also Off-highway Vehicles and Off-road Vehicles.)

Ambient - Usual or surrounding conditions.

Amphibian - Any of a class of cold-blooded vertebrates (including frogs, toads, or salamanders) intermediate in many characteristics between fishes and reptiles and having gilled aquatic larvae and air-breathing adults.

Anadromous - Fish that spend their adult life in the sea but swim upriver to fresh water spawning grounds to reproduce.

Analysis Area – The geographic area defining the scope of analysis for the project. Sometimes for a particular resource, the analysis area may have to be larger when effects have potential to extend beyond the boundaries of the proposal.

Annual Maintenance – Road maintenance performed to maintain serviceability or repair failures during the year in which they occur.

Aqueous - Describes a water-based solution or suspension.

Archaeological Site – Any site that is attributed to prehistoric American Indian cultures. A site is any location of use or occupation by human beings.

Arid - A terrestrial region lacking moisture, or a climate in which the rainfall is not sufficient to support the growth of most vegetation.

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).

Best Management Practices (BMP) - A practice or combination of practices determined by a state or an agency to be the most effective and practical means (technological, economic, and institutional) of controlling point and non-point source pollutants at levels compatible with environmental quality.

Big Game – Those species of large mammals normally managed as a sport hunting resource.

Biodiversity or Biological Diversity - The diversity of living things (species) and of life patterns and processes (ecosystem structures and functions). Includes genetic diversity, ecosystem diversity, landscape and regional diversity, and biosphere diversity.

Candidate Species - Those plant and animal species that, in the opinion of the Fish and Wildlife Service (FWS) or National Oceanic and Atmospheric Administration (NOAA) Fisheries, may qualify for listing as "endangered" or "threatened." The FWS recognizes two categories of candidates. Category 1 candidates are taxa for which the FWS has on file sufficient information to support proposals for listing. Category 2 candidates are taxa for which information available to the FWS indicates that proposing to list is possibly appropriate, but for which sufficient data are not currently available to support proposed rules.

Closed Roads - Roads closed for use by the public, but remain part of the national forest transportation system. These are typically Forest Roads, Maintenance Level 1 *(see also maintenance levels.)*.

Code of Federal Regulations (CFR) - Document that codifies all rules of the executive departments and agencies of the federal government. It is divided into fifty volumes, known as titles. Title 40 of the CFR (referenced as 40 CFR) lists all environmental regulations, including regulations for EPA pesticide programs (40 CFR Parts 150-189).

Collector Road – A forest road that serves smaller land areas than does an arterial road. Usually connects forest arterial roads to local forest roads (FSH – 7709.54 – Forest Transportation Terminology Handbook, no longer in print).

Community – A group of one or more populations of plants and/or animals in a common spatial arrangement; an ecological term used in a broad sense to include groups of various sizes and degrees of integration.

Congressionally Reserved Areas (CRA) - Areas that require Congressional enactment for their establishment, such as National Parks, Wild and Scenic Rivers, National Recreation Areas, National Monuments, and Wilderness. Also referred to as Congressional Reserves. Includes similar areas established by Executive Order, such as National Monuments.

Conifer - An order of the *Gymnospermae*, comprising a wide range of trees and a few shrubs, mostly evergreens that bear cones and have needle-shaped or scale-like leaves. Conifer timber is commercially identified as softwood.

Connected Actions - Exposure to other chemical and biological agents, in addition to exposure to a specific pesticide formulation in a field application to control pest organisms.

Cover – The present vegetation and litter of an area.

Cross-Country Travel – Traveling across the countryside (as fields and woods) rather than by roads or trails. Travel off of designated roads or trails.

Cultural Resources – The physical remains of human activity (artifacts, ruins, burial mounds, petroglyphs, etc.) having scientific, prehistoric, or social values.

Cultural Site – Any location that includes prehistoric and/or historic evidence of human use, or that has important sociocultural value.

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

Decision Roads – Roads defined in the 2003 Mt. Hood National Forest Roads Analysis as roads which are not needed to provide access to recreation opportunities or other management activities. They are labeled "decision roads" because a decision needs to be made on whether to close, decommission, or keep them open. The decision will be made through the NEPA process complete with public participation.

Decommission – To deactivate or dismantle a road; the denial of use, elimination of travelway functionality, and removal of the road from the forest transportation atlas; and the return of the road corridor to resource production by natural or designed means.

Decommissioned Roads – Roads that have been removed from the National Forest transportation atlas as a result of a formal decision involving participation by the public.

Deferred Maintenance – Road maintenance that was not performed when it should have been or when it was scheduled and which, therefore, was put off or delayed for a future period.

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 (36 CFR 212.1).

Developed Recreation – Recreation that requires facilities and results in the concentrated use of an area (e.g., campgrounds or ski resorts).

Direct Effects - Effects on the environment that occur at the same time and place as the initial cause of action.

Dispersed Campsite – Temporary undeveloped campsites that are typically created and maintained by forest users. Existing temporary campsites can be distinguished by evidence of rock fire rings, old tent sites, and tracks from earlier vehicle accesses.

Dispersed Recreation – Recreation that occurs outside a developed setting (e.g., hunting, scenic driving, or backpacking).

Disturbance - An effect of a planned human management activity, or unplanned native or exotic agent or event that changes the state of a landscape element, landscape pattern, or regional composition.

Ecosystem – A naturally occurring, self-maintained system of varied living and non-living interacting parts that are organized into biophysical and human dimension components.

Effect - Adverse and/or beneficial direct effects occur at the same time and in the same general location as the activity causing the effects. Adverse and beneficial indirect effects are those that occur at a different time or location from the activity causing the effects. Both types of effects are described in terms of increase or decreases, intensity, duration, and timing.

Endangered Species - Any species listed in the *Federal Register* as being in danger of extinction throughout all, or a significant portion, of its range.

Endangered Species Act (ESA) - A law passed in 1973 to conserve species of wildlife and plants, determined by the Director of the U.S. Fish and Wildlife Service or the NOAA Fisheries to be endangered or threatened with extinction in all or a significant portion of its range. Among other measures, ESA requires all federal agencies to conserve these species and consult with the Fish and Wildlife Service or NOAA Fisheries on federal actions that may affect these species or their designated critical habitat.

Endemic - A species or other taxonomic group that is restricted to a particular geographic region due to factors such as isolation or response to soil or climatic conditions. (Compare to "*Indigenous*" and "*Native*.")

Environment – The aggregate of physical, biological, economic, and social factors affecting organisms in an area.

Environmental Justice - Executive Order 12898 of February 11, 1994 requires federal agencies, to the greatest extent practicable and permitted by law, to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the commonwealth of the Mariana Islands.

Erosion – Detachment or movement of soil or rock fragments by water, wind, ice, or gravity. Accelerated erosion is much more rapid than normal, natural, or geologic erosion, primarily because of the influence of activities of people, animals, or natural catastrophes..

Essential Fish Habitat - waters and substrate necessary to fish (specifically chinook and coho salmon) for spawning, breeding, feeding, or growth to maturity.

Evolutionary Significant Unit (ESU) – a group of salmon or trout populations that is a distinct population segment. Scientists established two criteria for ESUs: 1) the population must show substantial reproductive isolation; and 2) there must be an important component of the evolutionary legacy of the species as a whole.

Existing Route – A road or trail that currently exists on the ground but that may or may not be designated as open to motorized use. Includes constructed roads and trails maintained by the Forest Service or cooperating agencies. Constructed roads and trails are often characterized by a road or trail prism with cut and fill slopes or through-fills. An existing route may also be an evident two-track and single-track route with regular use that has resulted from continuous passage of motorized vehicles over a period of years where perennial vegetation is devoid or scarce.

Fauna - The animals of a specified region or time.

Federal Register – A daily publication that reports Presidential and Federal agency documents.

Federally Listed Species - Formally listed as a threatened or endangered species under the Endangered Species Act. Designations are made by the Fish and Wildlife Service or the National Marine Fisheries Service.

Floodplain – The lowland and relatively flat areas adjoining inland and coastal waters including, at a minimum, that area subject to a 1 percent or greater chance of flooding in any given year.

Flora - Plant life, especially all the plants found in a particular country, region, or time regarded as a group. Also, a systematic set of descriptions of all the plants of a particular place or time.

Fluvial – Living in a stream or river.

Forage - Food for animals. In this document, term applies to both availability of plant material for wildlife and domestic livestock.

Forbs – Broadleaf ground vegetation with little or no woody material.

Forest Highway – A forest road under the jurisdiction of, and maintained by, a public authority and open to public travel (23 USC Section 101 (a)).

Forest Plan – Shortened name for a unit's Land and Resource Management Plan. Provides strategic guidance to management activities on National Forest System lands.

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 Service Handbook (FSH) – The principal source of specialized guidance and instruction for carrying out the direction issued in the Forest Service Manual (FSM). Specialists and technicians are the primary audience of handbook direction.

Forest Service Manual (FSM) – Contains legal authorities, objectives, policies, responsibilities, instructions, and guidance needed on a continuing basis by Forest Service line officers and primary staff in more than one unit to plan and execute assigned programs and activities.

Fry – Recently hatched fish.

Fungi - Molds, mildews, yeasts, mushrooms, and puffballs, a group of organisms that lack chlorophyll and therefore are not photosynthetic. They are usually non-mobile, filamentous, and multi-cellular.

Game Fish - Species like trout, salmon, or bass, caught for sport. Many of them show more sensitivity to environmental change than non-game fish.

Game Species – Any species of wildlife or fish for which seasons and bag limits have been prescribed, and that are normally harvested under state or federal laws, codes, or regulations.

Grazing Animals - Treatment method which requires matching the invasive species with the appropriate grazer for best success.

Ground Cover – The material covering the land surface. Ground cover can include live vegetation, standing dead vegetation, litter, cryptograms, and rock.

Groundwater – The supply of fresh water found beneath the Earth's surface, usually in aquifers, which often supply wells and springs.

Habitat – The place where a population (e.g., human, animal, plant, microorganism) lives and its surroundings, both living and non-living.

Historic – After the introduction of written records.

Historical Site – Any site that is 50 years of age or older that is attributed to any historical cultures, including American Indian or European immigrant cultures. A site is any location of use or occupation by human beings.

Hydrologic Unit Code – The U.S. is divided and sub-divided into successively smaller hydrologic units which are classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are arranged within each other, from the smallest (cataloging units) to the largest (regions). Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to eight digits based on the four levels of classification in the hydrologic unit system (http://water.usgs.gov/GIS/huc.html).

Indian Tribe – Any American Indian or Alaska Native tribe, band, nation, pueblo, community, rancheria, colony, or group meeting the provisions of the Code of Federal Regulations Title 25, Section 83.7 (25 FR 83.7), or those recognized in statutes or treaties with the United States.

Indigenous – An indigenous species is any which were or are native or inherent to an area. (See also, *native*.)

Indirect Effects – Secondary effects that occur in locations other than the location of the initial action or significantly later in time.

Interdisciplinary Team (IDT) – A group of individuals with varying areas of specialty assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad enough to adequately analyze the problem and propose action.

Invasive Plant Species – An alien plant species whose introduction does or is likely to cause economic or environmental harm or harm to human health (Executive Order 13122, 2/3/99). *(Also known as exotic species, invasive plant species, introduced species, and noxious weed)*

Inventoried Roadless Areas – Areas of undeveloped Federal land, greater than 5,000 acres in size, within which there are no improved roads maintained for travel by means of motorized vehicles intended for highway use. Exceptions are those areas less than 5,000 acres manageable in their natural condition, contiguous to existing wilderness, or are of issue to the public.

Irretrievable Impact or Commitment – The elimination of a resource, its productivity, and/or its utility for the life of the project.

Irreversible Impact – The start of a chemical, biological, and/or physical process that could not be stopped. As a result, the resource or its productivity and/or its utility would be consumed, committed, or lost forever.

Jurisdiction – The legal right to control or regulate use of a transportation facility. Jurisdiction requires authority, but not necessarily ownership. The authority to construct or maintain a road may be derived from fee title, an easement, or some other similar method (FSM 7705 – Transportation System).

Key Issue – Significant issues identified by the public that are used to formulate alternatives, affect the design of alternative components, prescribe PDC, or describe environmental effects.

Land Allocation - Commitment of a given area of land or a resource to one or more specific uses (e.g. wilderness). In the Northwest Forest Plan, one of the seven allocations of Congressionally Withdrawn Areas, Late-Successional Reserves, Adaptive Management Areas, Managed Late-Successional Areas, Administratively Withdrawn Areas, Riparian Reserves, or Matrix.

Landscape - An area composed of interacting ecosystems that are repeated because of geology, land form, soils, climate, biota, and human influences throughout the area. Landscapes are generally of a size, shape, and pattern which are determined by interacting ecosystems.

Landscape Character - Particular attributes, qualities, and traits of a landscape that give it an image and make it identifiable or unique.

Landscape Setting - The context and environment in which a landscape is set; a landscape backdrop. It is the combination of land use, landform, and vegetation patterns that distinguish an area in appearance and character from other areas.

Lichens - Complex thallophytic plants comprised of an alga and a fungus growing in symbiotic association on a solid surface (such as a rock.)

Local Road – A forest road that connects terminal facilities with forest collector, forest arterial, or public highways. Usually forest local roads are single purpose transportation facilities (FSH 7709.54 – Forest Transportation Terminology Handbook, no longer in print).

Macroinvertebrate – Animals without backbones such as insects, clams, snails, etc.

Macrophyte – Terrestrial or aquatic plant that is large enough to be seen without the aid of a microscope.

Maintenance – The upkeep of the entire forest development transportation facility including surface and shoulders, parking and side areas, structures, and such traffic-control devices as are necessary for its safe and efficient utilization (36 CFR 212.2 (i)).

Maintenance Levels – Operational levels for road maintenance defined in Forest Service Handbook under 709.58- Transportation System Maintenance:

- **Level 1** - Assigned to roads of intermittent service during the period that they are closed to vehicular traffic. Roads receiving level-1 maintenance may be of any type, class, or construction standard, and may be managed at any other maintenance level during the time they are open for traffic. However, while being maintained at level 1, they are closed to vehicular traffic, but may be open and suitable for non-motorized uses.
- **Level 2** - Assigned to roads open for use by high-clearance vehicles. Passenger car traffic is not considered.
- **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.
- **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 dust abated or paved.
- **Level 5** - Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double lane, paved facilities.

Management Indicator Species – A species of wildlife, fish, or plant whose health and vigor are believed to accurately reflect the health and vigor of other species having similar habitat and protection needs to those of the selected indicator species.

Manual Treatment Method/Control – The use of any non-mechanized approach to control or eliminate invasive plants (i.e. hand-pulling, grubbing.)

Microorganisms – A generic term for all organisms consisting only of a single cell, such as bacteria, viruses, protozoa and some fungi.

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.

Mollusks – Invertebrate animals (such as slugs, snails, clams, or squids) that have a soft, un-segmented body, usually enclosed in a calcareous shell; representatives found on National Forest System land include snails, slugs, and clams.

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 battery-powered, that is designed solely for use by a mobility-impaired person for locomotion and that is suitable for use in an indoor pedestrian area.

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).

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, and establishes a Council on Environmental Quality.

National Forest Management Act (NFMA) - A law passed in 1976 as 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 Marine Fisheries Service (NMFS) - The federal agency that is the listing authority for marine mammals and anadromous fish under the ESA.

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 other lands, waters, or interests therein that are administered by the Forest Service or are designated for administration through the Forest Service as a 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 a State, county, or other local public road authority.

National Forest System Trail – A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority.

National 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.

National Visitor Use Monitoring (NVUM) – 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 of, and satisfaction with, national forest system recreation opportunities.

National Wilderness Preservation System (NWPS) – The Wilderness Act of 1964 established the national Wilderness Preservation System to ensure that certain federally owned areas in the United States would be preserved and protected in their natural condition. The Act defines a wilderness area, in part, as an area which generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable. Areas included in the system are administered for the use and enjoyment of the American people in such manner as to leave them unimpaired for future use and enjoyment as wilderness.

Native Species – With respect to a particular ecosystem, a species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem (Executive Order 13122, 2/3/99).

Non-Motorized Travel – Modes of travel that include hiking, equestrian, and mountain bikes and exclude all motorized use.

Off-highway Vehicles (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. *(See also All-terrain Vehicles and Off-road Vehicles.)*

Off-road Vehicles (ORV) – Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, snow, ice, or other natural terrain. Non-motorized Mountain Bicycle is also considered an Off-road vehicle in the Mt. Hood Land and Resource Management Plan. *(See also All-terrain Vehicles and Off-highway Vehicles.)*

Operation Permit – Sticker placed on an OHV that allows access to public lands in designated areas in the State of Oregon.

Outstandingly Remarkable Value (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.

Periphyton – Microscopic plants and animals that are firmly attached to solid surfaces under water such as rocks, logs, pilings and other structures.

Phytoplankton – Free floating algae.

Population – A group of individuals of the same species in an area.

Porosity – Degree to which soil, gravel, sediment, or rock is permeated with pores or cavities through which water or air can move.

Potable Water – Water that is considered safe for drinking and cooking.

Prehistoric – Prior to written records being kept.

Private Road – A road under private ownership authorized by easement to a private party or a road which provides access pursuant to a reserved or private right (FS 643 – Roads Analysis – Informing Decisions About Managing The National Forest Transportation System, August 1999).

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 and 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 a *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.

Research Natural Area – "Research Natural Areas are part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity on National Forest System lands. Research Natural Areas are principally for non-manipulative research, observation, and study. They also may assist in implementing provisions of special acts, such as the Endangered Species Act of 1973 and the monitoring provisions of the National Forest Management Act of 1976" (FSM 4063).

Reserved Rights – Rights tribes kept, or reserved, during 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 through 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.

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.

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 Management Objective – Defines the intended purpose of an individual road based on management area direction and access management objectives. Road management objectives contain design criteria, operation criteria, and maintenance criteria (FSH 7709.55 Sec 33 – Transportation Planning Handbook).

Route – A generic term that includes roads and trails as defined in this glossary.

Salmonid – Fish belonging to the family Salmonidae (salmon, trout, char).

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 the 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 to society in general.

Scenic Rivers – 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 in places by roads.

Seasonal Closure – 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 will 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.

Smolt – A young salmon or anadromous trout in the process of transforming to a saltwater dwelling fish

Snag – A standing dead tree.

Special Status Species – Federally listed and proposed threatened and endangered species; USDA Forest Service Pacific Northwest Region sensitive species and Survey and Manage species; Mt. Hood National Forest Land and Resource Management Plan management indicator species; and Sensitive Plan and Wildlife Species as defined in the Columbia River Gorge Management Plan.

Special Use Permit – A permit issued under established laws and regulations to an individual, organization, or company for occupancy or use of National Forest System lands for some special purpose.

Species – "A group of organisms, all of which have a high degree of physical and genetic similarity, generally interbreed only among themselves, and show persistent differences from members of allied groups of organisms" (Executive Order 13122, 2/3/99).

Spring – The point where ground water emerges onto the land surface.

Standards and Guidelines – The rules and limits governing actions, as well as the principles specifying the environmental conditions or levels to be achieved and maintained.

Summer Range – A range, usually at higher elevation, used by deer and elk during summer. A summer range is usually much more extensive than a winter range.

Surface Water – All water naturally open to the atmosphere (rivers, lakes, reservoirs, streams, impoundments, seas, estuaries, etc.) and all springs, wells, or other collectors which are directly influenced by surface water.

Take – "The term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (Title 16, Chapter 35, Section 1532, Endangered Species Act of 1973).

Thallus – The vegetative body of a lichen.

Threatened Species – Plant or animal species likely to become endangered throughout all, or a significant portion of, its range within the foreseeable future. A plant or animal identified and defined in accordance with the 1973 Endangered Species Act and published in the Federal Register.

Traditional Cultural Property – A location or community that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that are rooted in that community's history, and are important in maintaining the continuing cultural identity of the community. Properties can include buildings, structures, and sites; groups of buildings, structures or sites forming historic districts; landscapes; and individual objects (36 CFR 60.4).

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 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.

a. <u>Easiest</u>: A trail requiring limited physical ability and skill to travel.

b. <u>More Difficult</u>: A trail requiring some physical ability and skill to travel.

c. <u>Most Difficult</u>: A trail requiring a high degree of physical ability and skill to travel.

Tracking Issue – Issues determined to be relevant, but are not used to formulate alternatives. These issues often describe minor or consistent consequences among alternatives considered in detail.

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 will be a standardized map which designates roads and trails that are open to motorized use. After the 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 more than one Band.

Tribal and Treaty Rights – Native American treaty and 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 the 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 Rule.

Undesignated Road or Trails – 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.

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 the planning area to ensure the long-term existence of the species.

Viewshed – Total visible area from a single observer position, or the total visible area from multiple observer position. 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 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 scales.

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 outstandingly remarkable values, to be preserved in 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; include 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.

Wild Rivers – A classification within the national Wild and Scenic River System. Wild rivers are those rivers, or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted.

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 fires 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 ranges.

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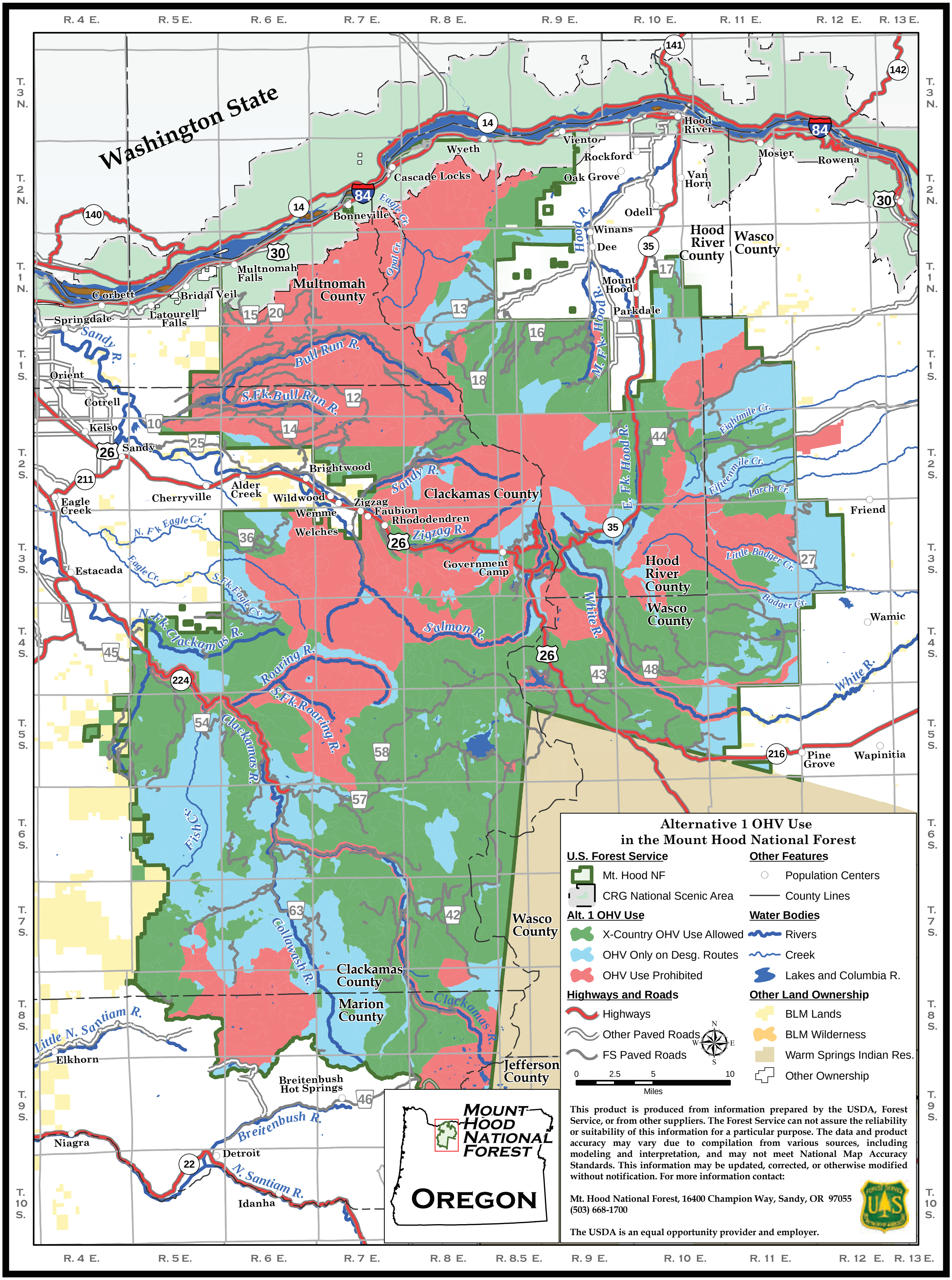
Appendices

Appendix A
Maps for all Alternatives


Alternative 1 OHV Use
in the Mount Hood National Forest
U.S. Forest Service
Mt. Hood NF
CRG National Scenic Area
Alt. 1 OHV Use
X-Country OHV Use Allowed
OHV Only on Desg. Routes
OHV Use Prohibited
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MOUNT HOOD NATIONAL FOREST
OREGON
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Clackamas County
Hood River County
Wasco County
Marion County
Jefferson County
Hood River
Mosier
Rowena
Viento
Wyeth
Rockford
Oak Grove
Cascade Locks
Bonneville
Van Horn
Odell
Winans
Dee
Mount Hood
Parkdale
Multnomah Falls
Corbett
Bridal Veil
Latourell Falls
Springdale
Orient
Cotrell
Kelso
Sandy
Brightwood
Alder Creek
Cherryville
Eagle Creek
Wildwood
Zigzag
Faubion
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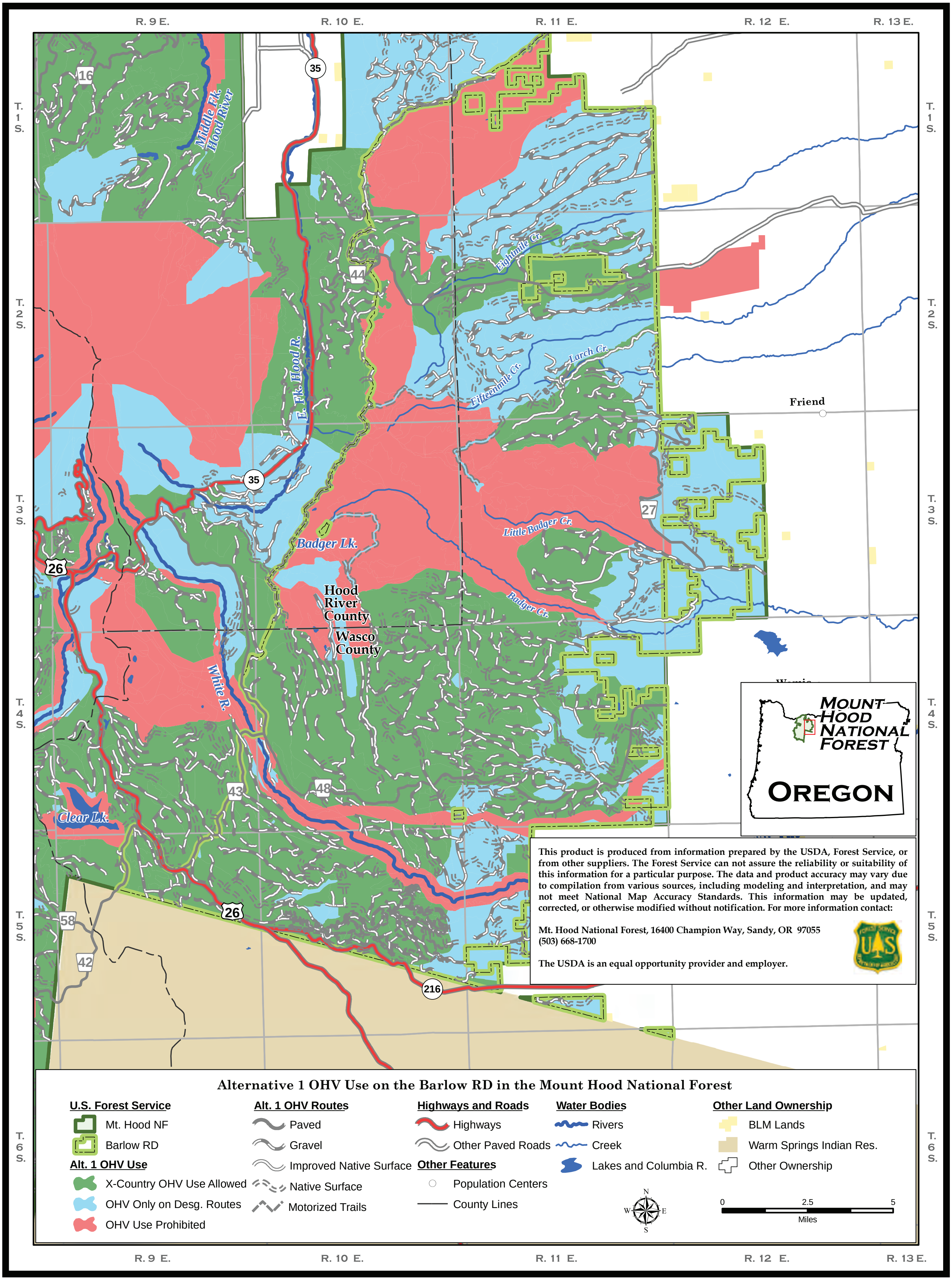
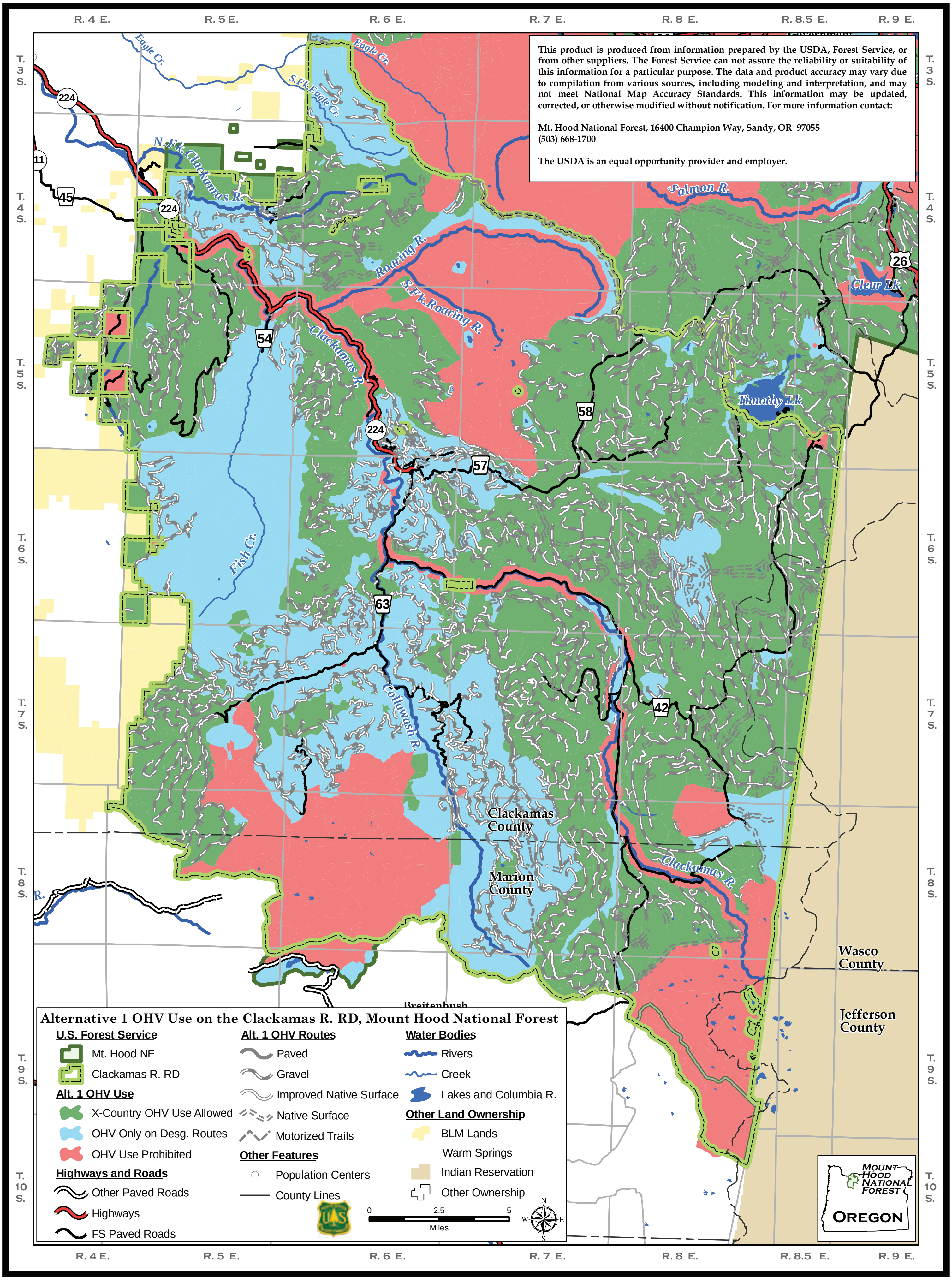


Alternative 1 OHV Use on the Barlow RD in the Mount Hood National Forest



Alternative 1 OHV Use on the Clackamas R. RD, Mount Hood National Forest
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S.Fk.Roaring R.
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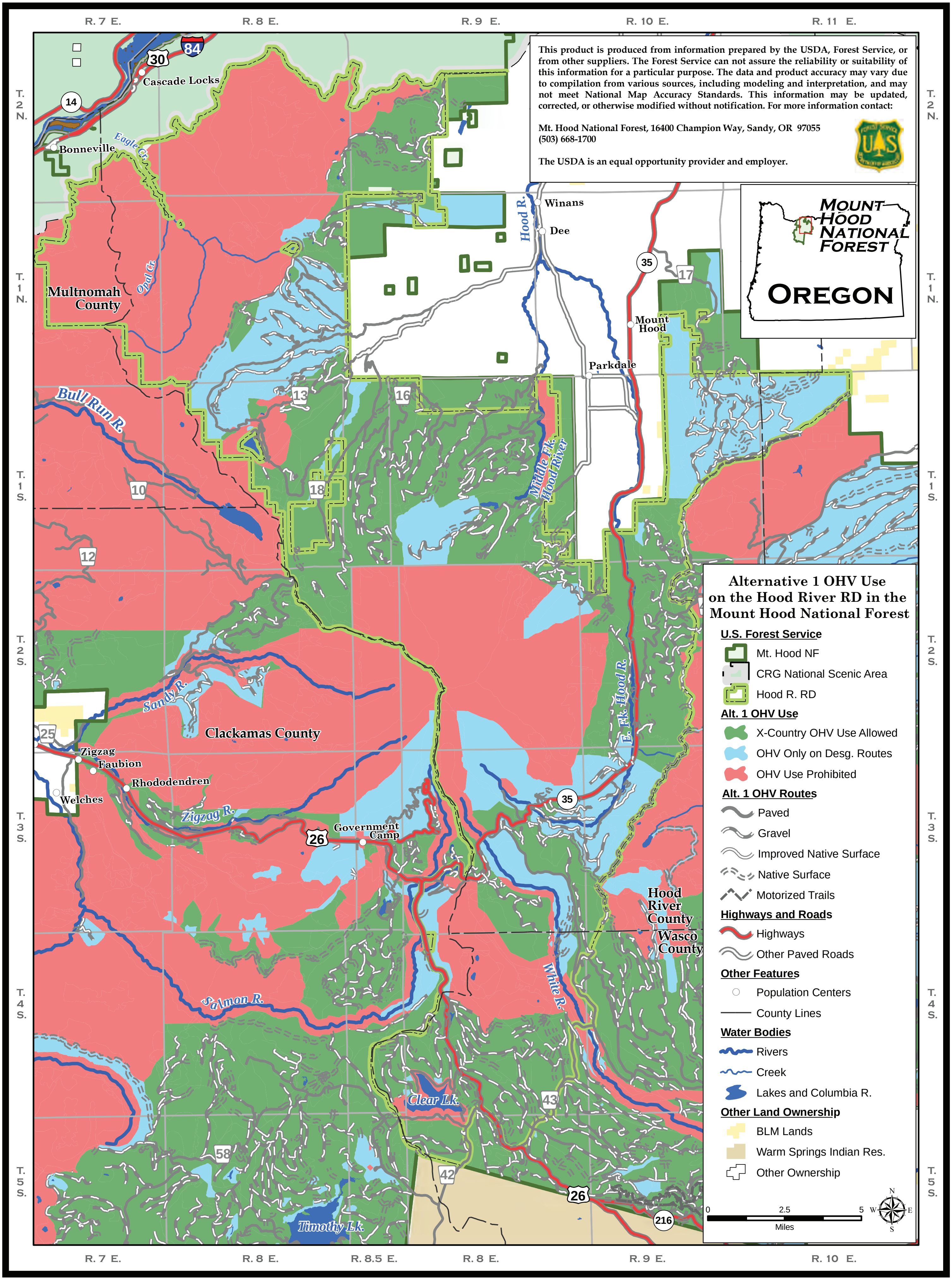

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Alternative 1 OHV Use on the Hood River RD in the Mount Hood National Forest
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Mt. Hood NF
CRG National Scenic Area
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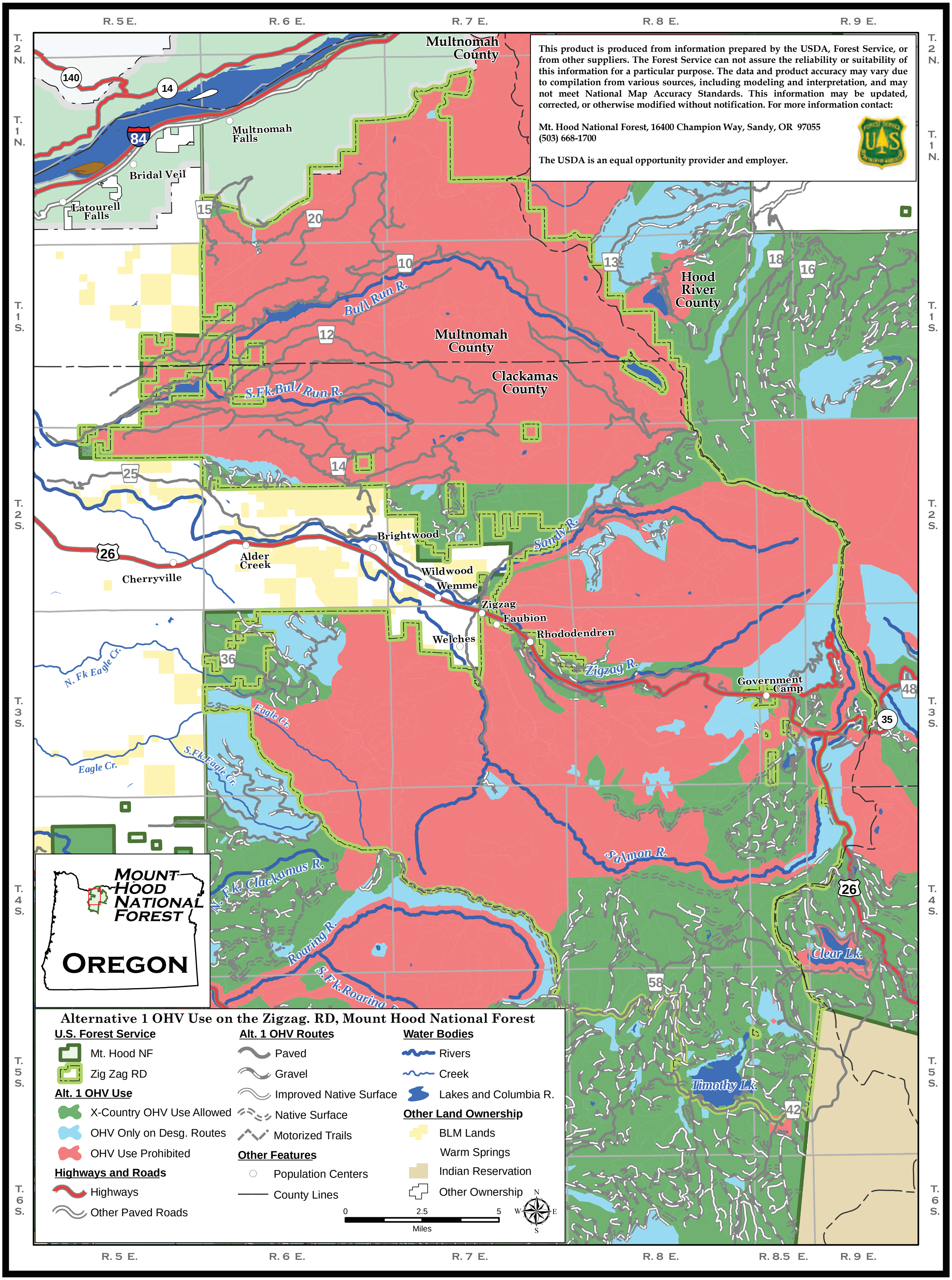
Alternative 1 OHV Use on the Zigzag. RD, Mount Hood National Forest
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Hood River County
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Bridal Veil
Latourell Falls
Bull Run R.
S.Fk.Bull Run R.
Sandy R.
Zigzag R.
Salmon R.
N. Fk Eagle Cr.
Eagle Cr.
S.Fk.Eagle Cr.
N. Fk. Clackamas R.
Roaring R.
S.Fk.Roaring R.
Clear Lk.
Timothy Lk.
Brightwood
Alder Creek
Cherryville
Wildwood
Wemme
Zigzag
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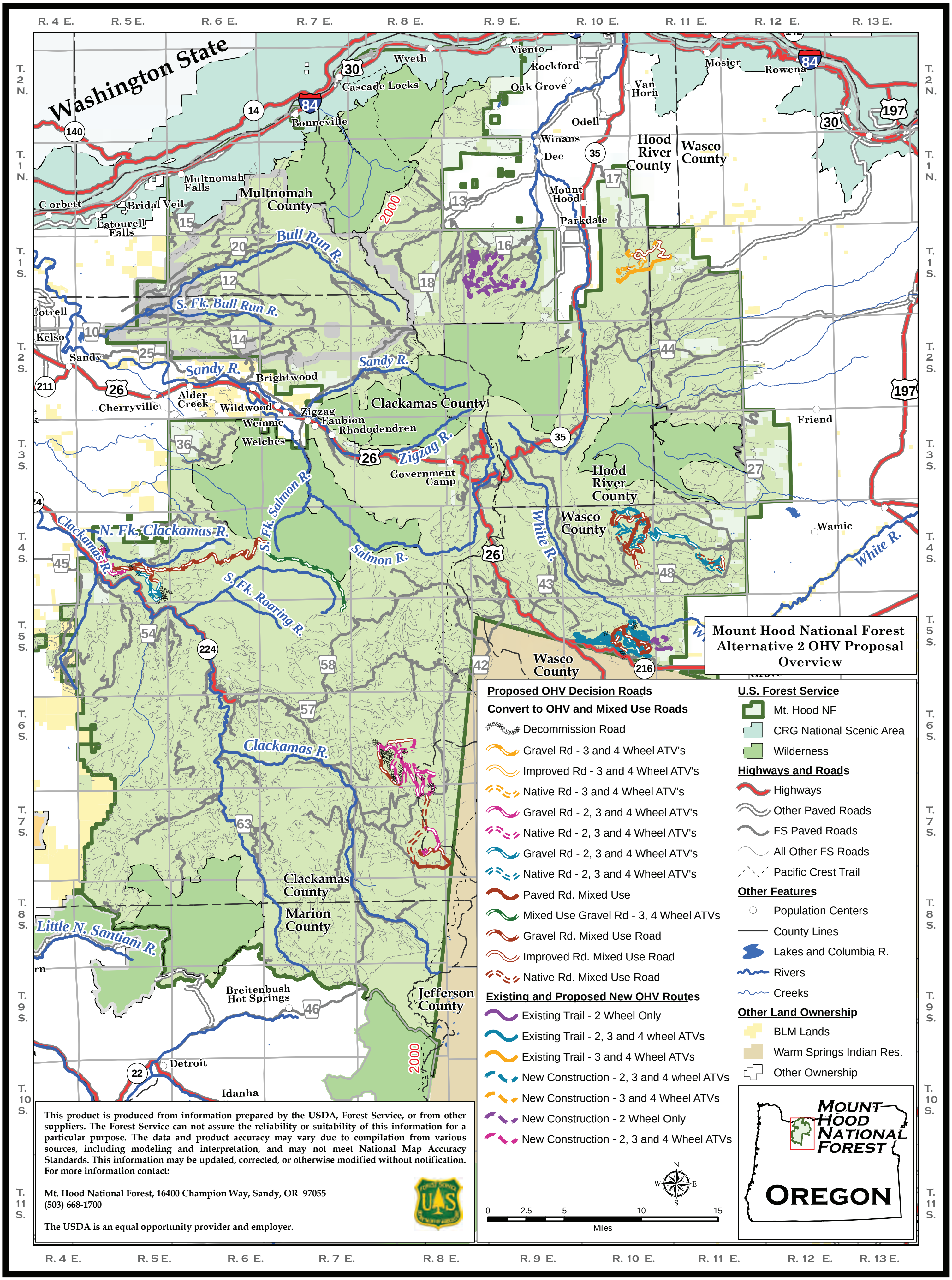

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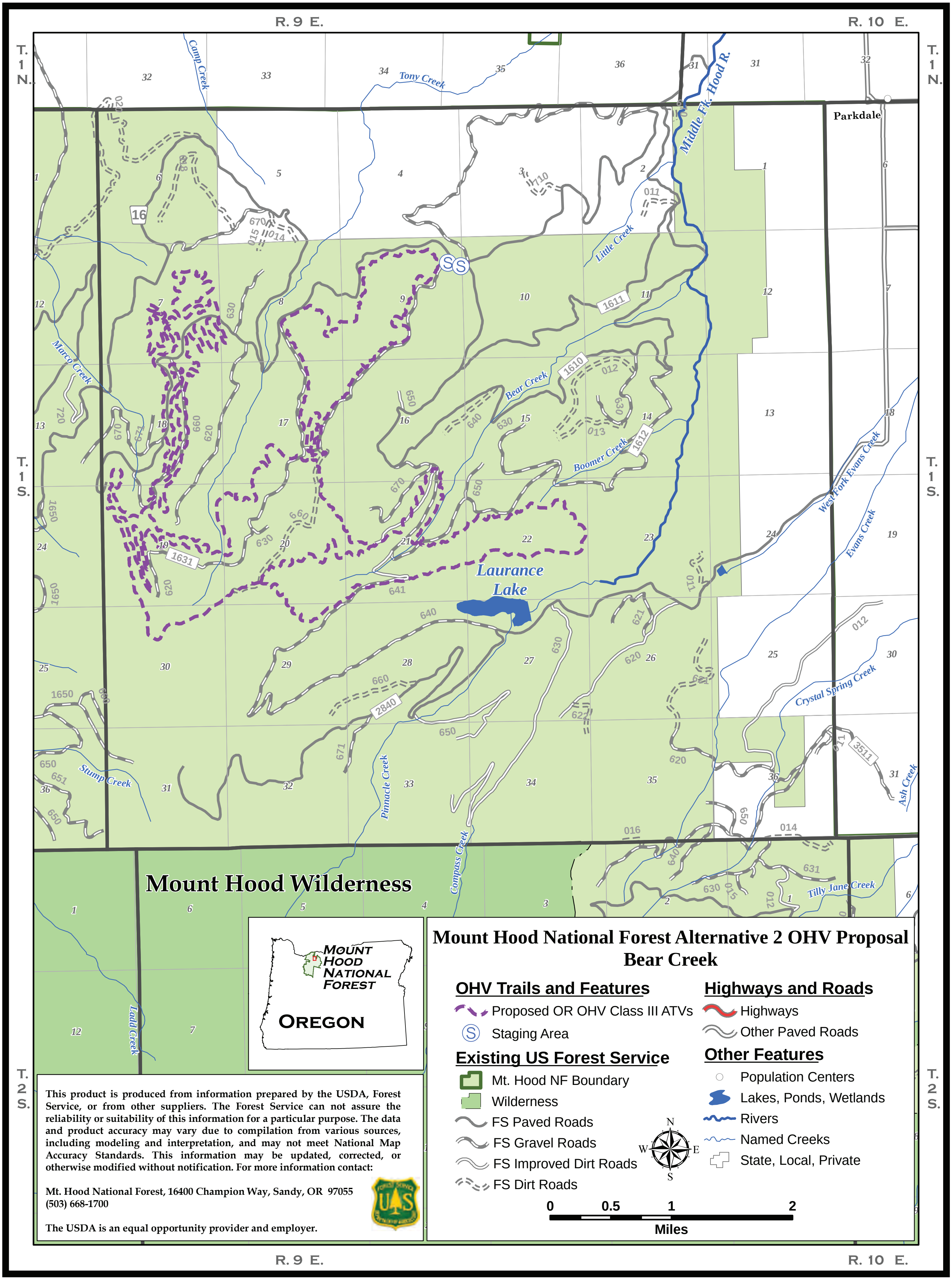

Mount Hood National Forest Alternative 2 OHV Proposal
Bear Creek

OHV Trails and Features
- Proposed OR OHV Class III ATVs
- Staging Area

Existing US Forest Service
- Mt. Hood NF Boundary
- Wilderness
- FS Paved Roads
- FS Gravel Roads
- FS Improved Dirt Roads
- FS Dirt Roads

Highways and Roads
- Highways
- Other Paved Roads

Other Features
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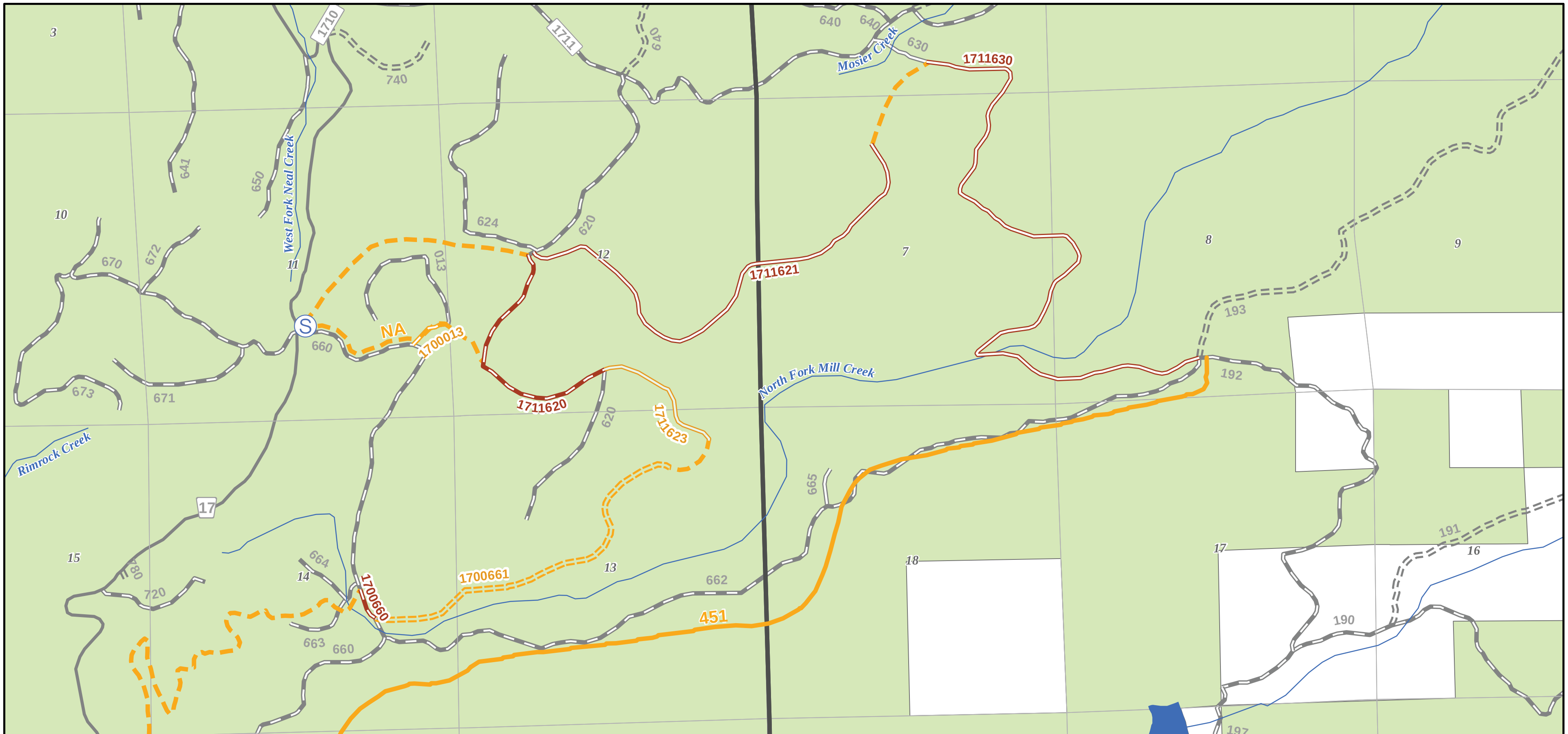
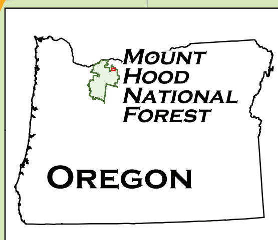


Mount Hood National Forest Alternative 2 OHV Proposal
Gibson Prairie



OHV Decision Roads

- Convert to OR OHV Class I ATVs
- Convert to OR OHV Class I ATVs
- Convert to OR OHV Class I ATVs
- Mixed-Use::OR OHV Class I ATVs
- Mixed-Use: OR OHV Class I ATVs
- Mixed-Use: OR OHV Class I ATVs

OHV Trails and Features

- Existing OR OHV Class I ATVs
- Proposed OR OHV Class I ATVs
- Staging Area

Existing US Forest Service

- Mt. Hood National Forest
- FS Paved Roads
- FS Gravel Roads
- FS Improved Dirt Roads
- FS Dirt Roads

Highways and Roads

- Highways
- Other Paved Roads

Other Features

- Population Centers
- Rivers
- Named Creeks
- State, Local, Private

0 0.25 0.5 1
Miles

N W E S

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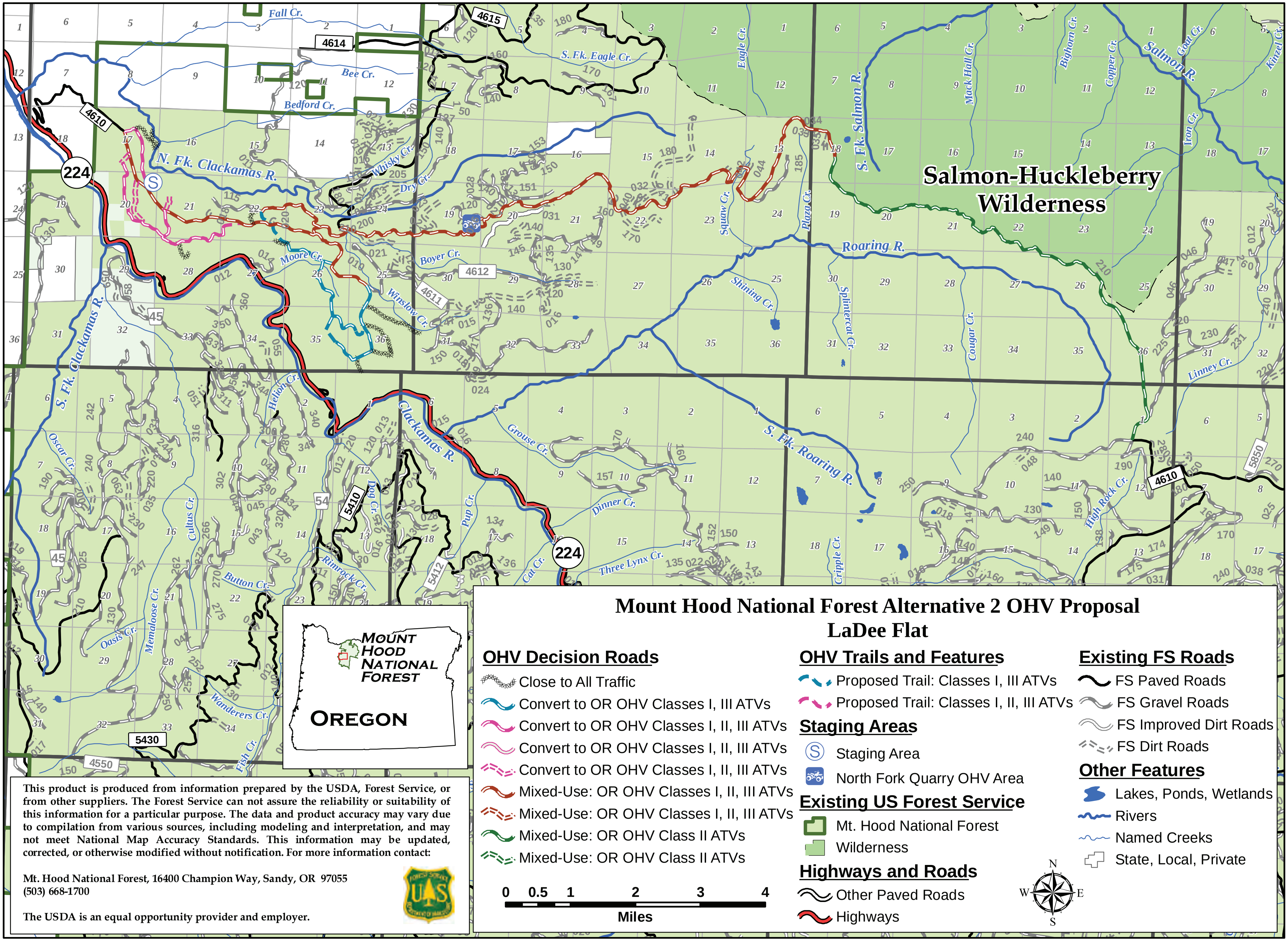

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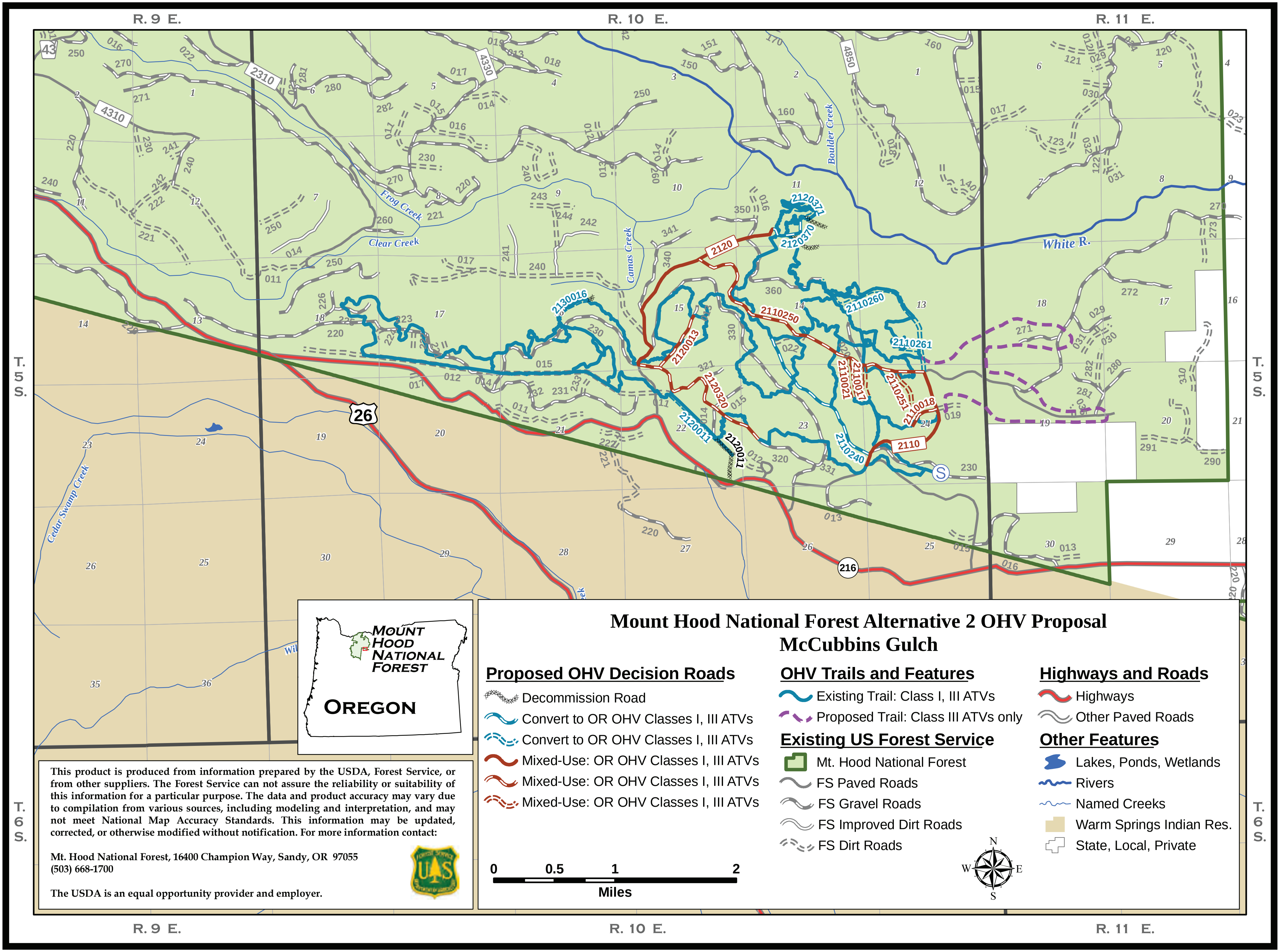
Mount Hood National Forest Alternative 2 OHV Proposal
McCubbins Gulch
Proposed OHV Decision Roads
Decommission Road
Convert to OR OHV Classes I, III ATVs
Convert to OR OHV Classes I, III ATVs
Mixed-Use: OR OHV Classes I, III ATVs
Mixed-Use: OR OHV Classes I, III ATVs
Mixed-Use: OR OHV Classes I, III ATVs
OHV Trails and Features
Existing Trail: Class I, III ATVs
Proposed Trail: Class III ATVs only
Existing US Forest Service
Mt. Hood National Forest
FS Paved Roads
FS Gravel Roads
FS Improved Dirt Roads
FS Dirt Roads
Highways and Roads
Highways
Other Paved Roads
Other Features
Lakes, Ponds, Wetlands
Rivers
Named Creeks
Warm Springs Indian Res.
State, Local, Private
0 0.5 1 2
Miles
N S E W
MOUNT HOOD NATIONAL FOREST
OREGON
R. 9 E.
R. 10 E.
R. 11 E.
T. 5 S.
T. 6 S.
White R.
Boulder Creek
Camas Creek
Frog Creek
Clear Creek
Cedar Swamp Creek
2120
2110
2110250
2110260
2110261
2110017
2110021
2110251
2110018
2110240
2120371
2120370
2120013
2120320
2120011
2130016
26
216
43
2310
4310
4330
4850
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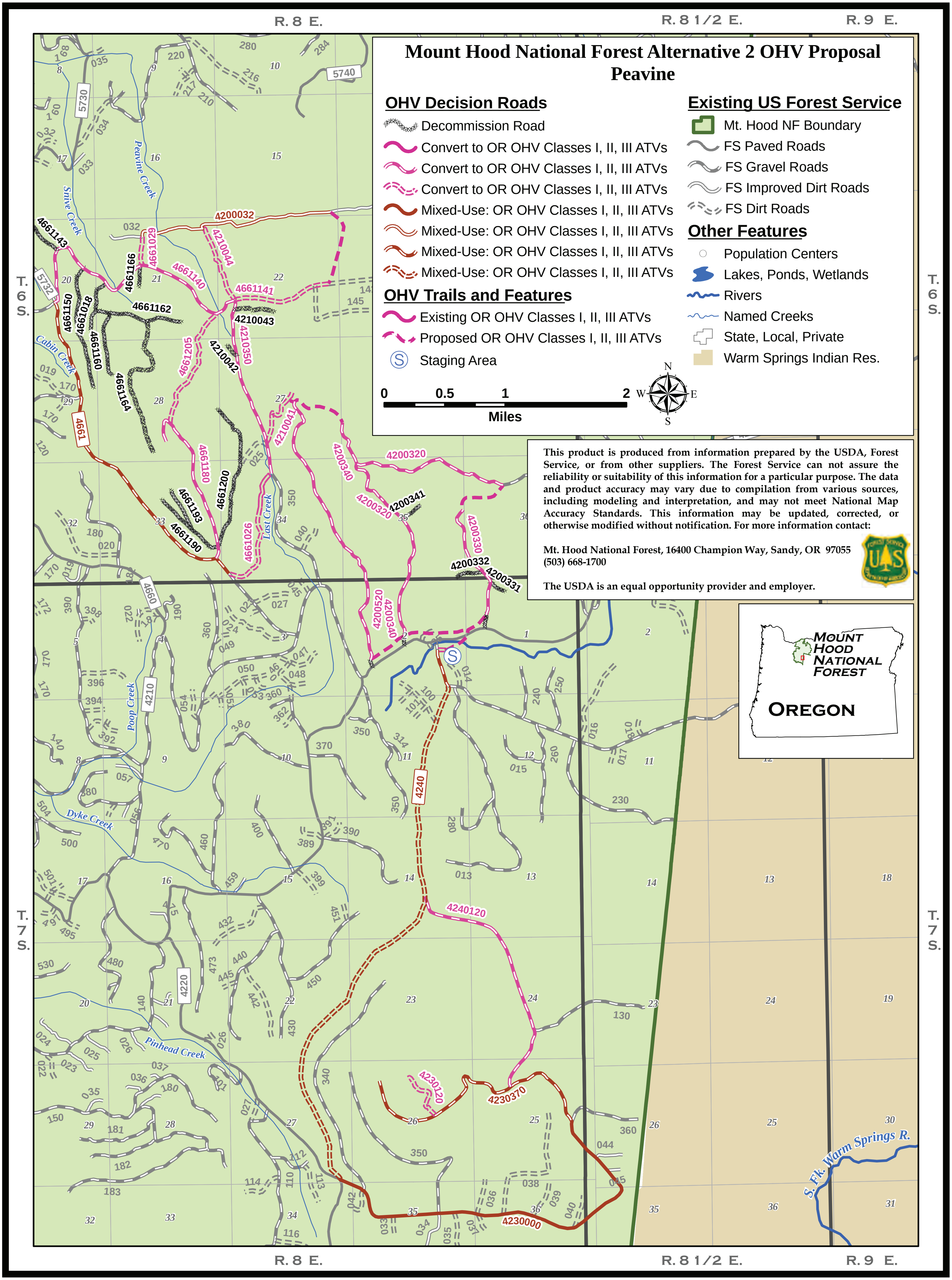
Mount Hood National Forest Alternative 2 OHV Proposal
Peavine
OHV Decision Roads
Decommission Road
Convert to OR OHV Classes I, II, III ATVs
Convert to OR OHV Classes I, II, III ATVs
Convert to OR OHV Classes I, II, III ATVs
Mixed-Use: OR OHV Classes I, II, III ATVs
Mixed-Use: OR OHV Classes I, II, III ATVs
Mixed-Use: OR OHV Classes I, II, III ATVs
Mixed-Use: OR OHV Classes I, II, III ATVs
OHV Trails and Features
Existing OR OHV Classes I, II, III ATVs
Proposed OR OHV Classes I, II, III ATVs
Staging Area
Existing US Forest Service
Mt. Hood NF Boundary
FS Paved Roads
FS Gravel Roads
FS Improved Dirt Roads
FS Dirt Roads
Other Features
Population Centers
Lakes, Ponds, Wetlands
Rivers
Named Creeks
State, Local, Private
Warm Springs Indian Res.
0 0.5 1 2
Miles
N E S W
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Mount Hood National Forest
Oregon
R. 8 E.
R. 8 1/2 E.
R. 9 E.
T. 6 S.
T. 7 S.
Peavine Creek
Snive Creek
Cabin Creek
Last Creek
Poop Creek
Dyke Creek
Pinhead Creek
S. Fk. Warm Springs R.
4200032
4210044
4661029
4661143
4661166
4661140
4661141
4661162
4661150
4661018
4661160
4661164
4210043
4210350
4210042
4661205
4210041
4200340
4200320
4200341
4661180
4661200
4661193
4661190
4661026
4200330
4200332
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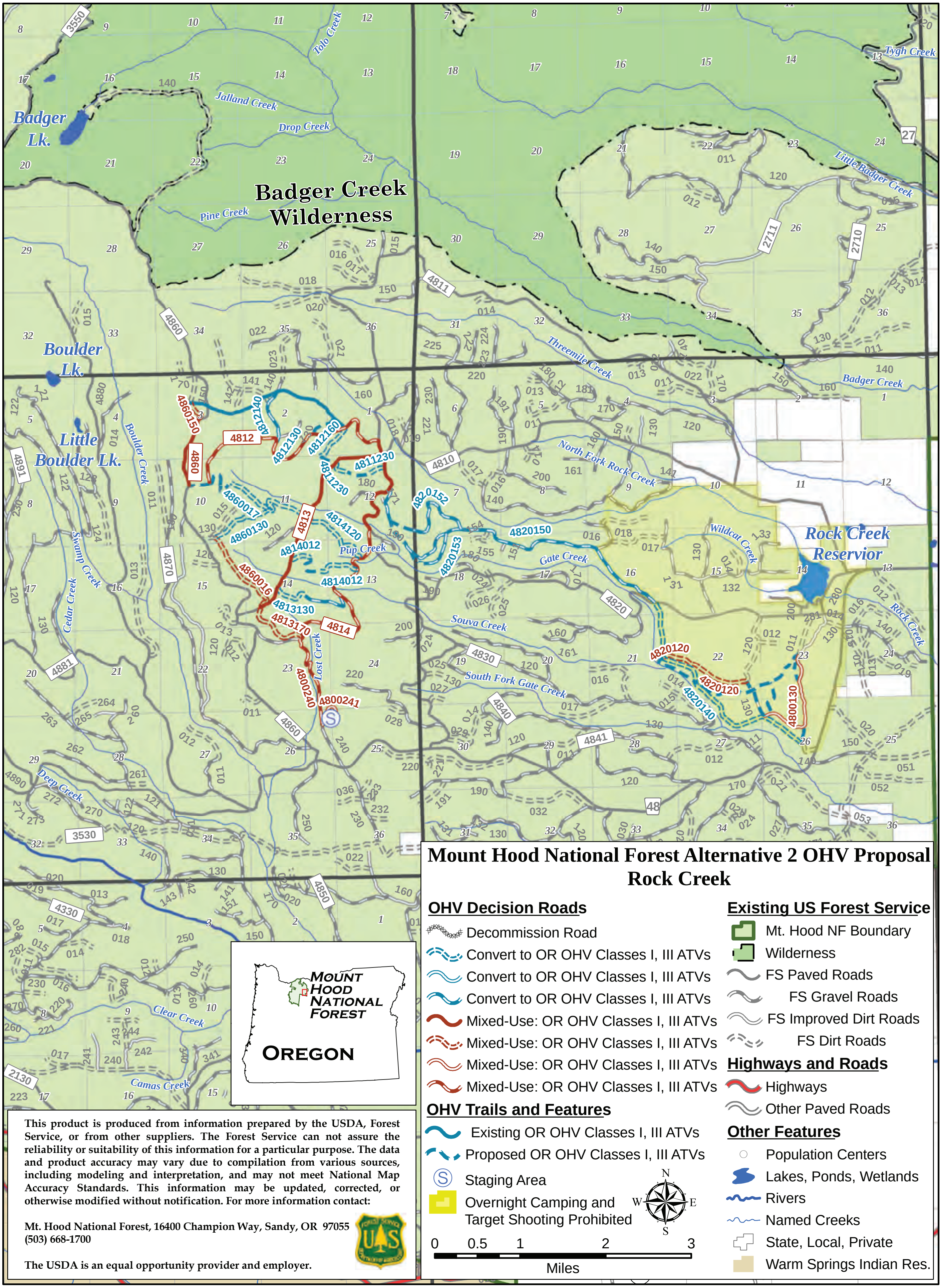
5740
4660
4210
4220



Mount Hood National Forest Alternative 2 OHV Proposal
Rock Creek

OHV Decision Roads
- Decommission Road
- Convert to OR OHV Classes I, III ATVs
- Convert to OR OHV Classes I, III ATVs
- Convert to OR OHV Classes I, III ATVs
- Mixed-Use: OR OHV Classes I, III ATVs
- Mixed-Use: OR OHV Classes I, III ATVs
- Mixed-Use: OR OHV Classes I, III ATVs
- Mixed-Use: OR OHV Classes I, III ATVs

OHV Trails and Features
- Existing OR OHV Classes I, III ATVs
- Proposed OR OHV Classes I, III ATVs
- Staging Area
- Overnight Camping and Target Shooting Prohibited

Existing US Forest Service
- Mt. Hood NF Boundary
- Wilderness
- FS Paved Roads
- FS Gravel Roads
- FS Improved Dirt Roads
- FS Dirt Roads

Highways and Roads
- Highways
- Other Paved Roads

Other Features
- Population Centers
- Lakes, Ponds, Wetlands
- Rivers
- Named Creeks
- State, Local, Private
- Warm Springs Indian Res.

N W E S

0 0.5 1 2 3
Miles

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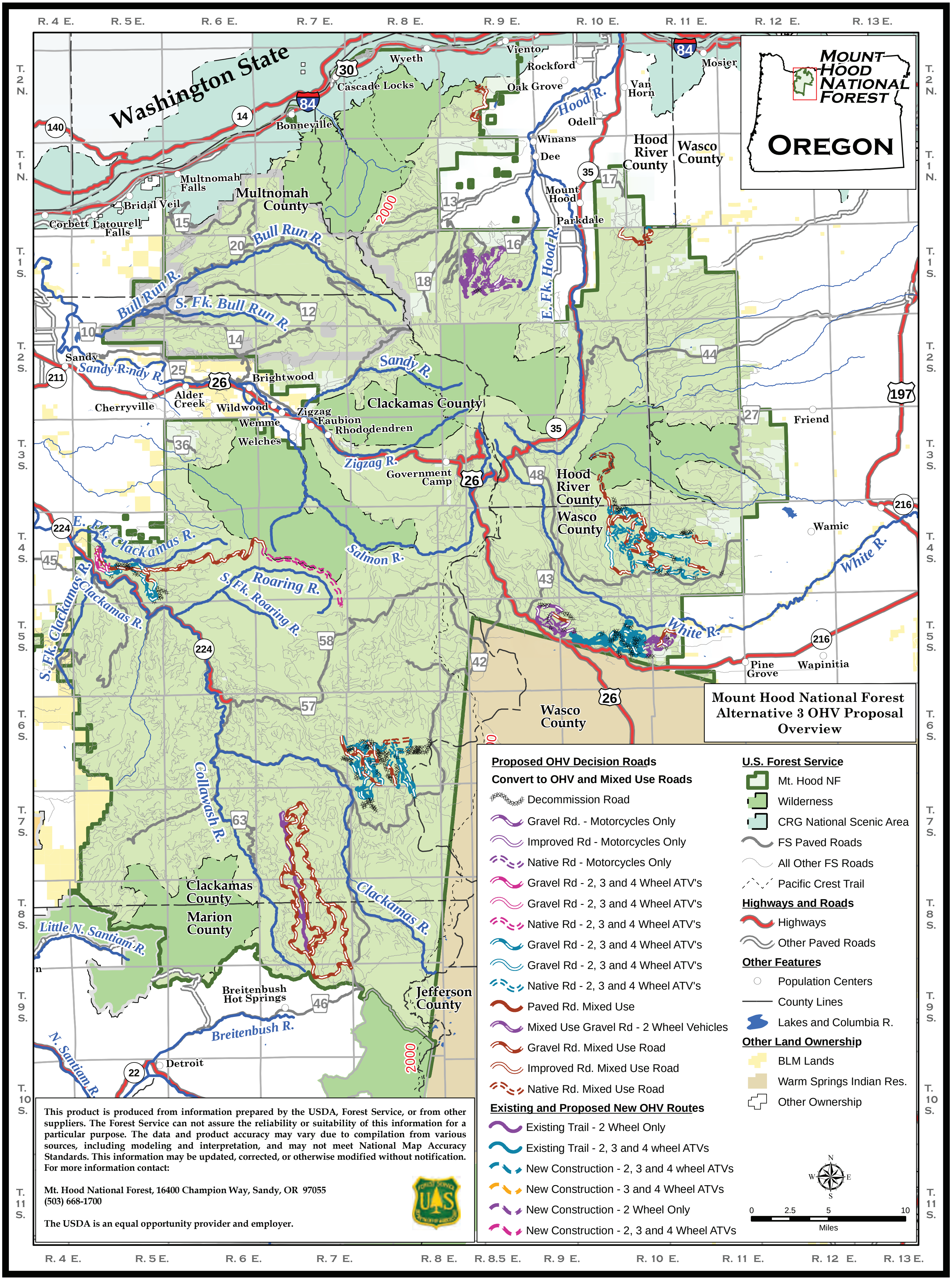

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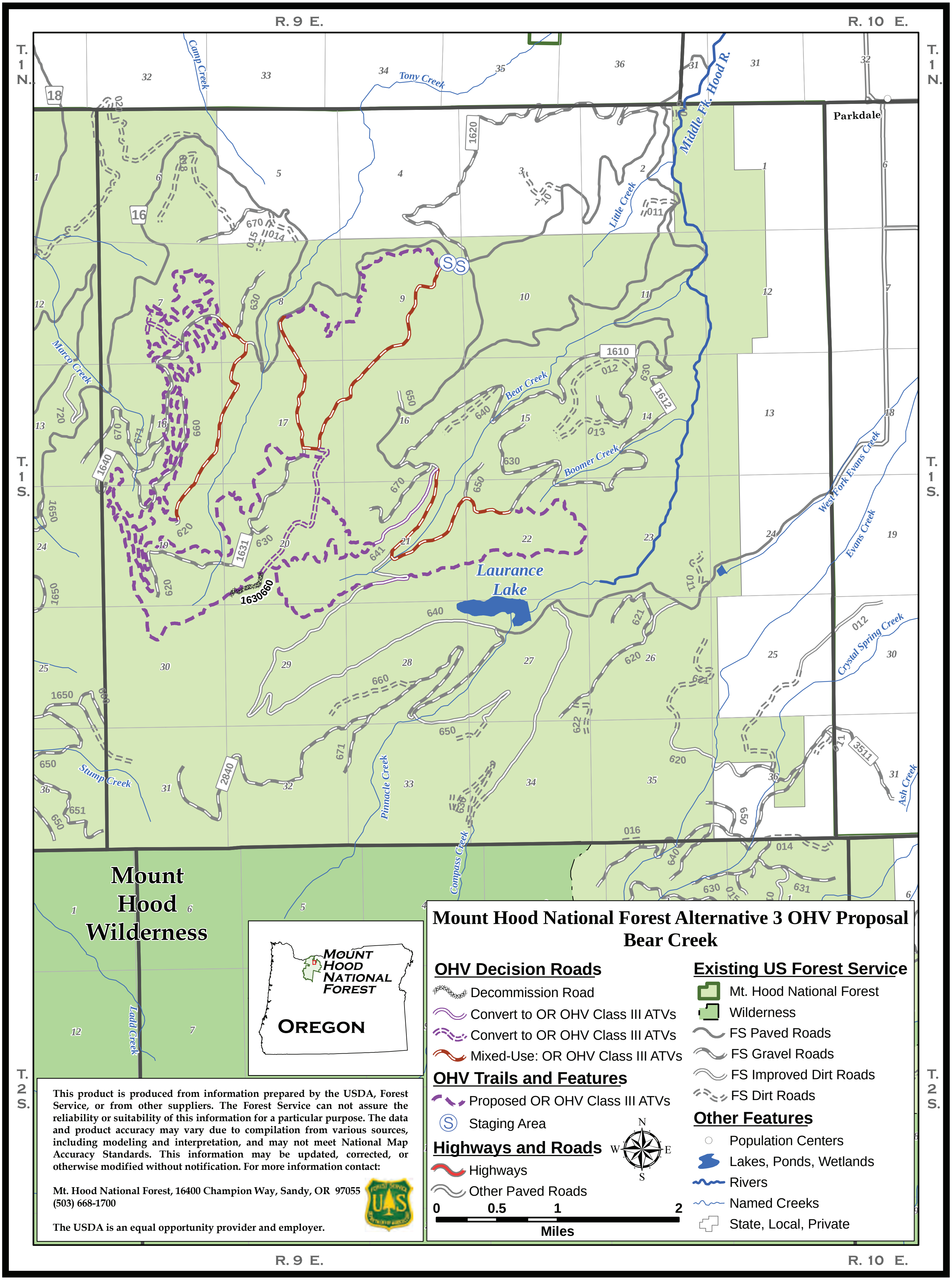

Mount Hood National Forest Alternative 3 OHV Proposal
Bear Creek

OHV Decision Roads
- Decommission Road
- Convert to OR OHV Class III ATVs
- Convert to OR OHV Class III ATVs
- Mixed-Use: OR OHV Class III ATVs

OHV Trails and Features
- Proposed OR OHV Class III ATVs
- Staging Area

Highways and Roads
- Highways
- Other Paved Roads

Existing US Forest Service
- Mt. Hood National Forest
- Wilderness
- FS Paved Roads
- FS Gravel Roads
- FS Improved Dirt Roads
- FS Dirt Roads

Other Features
- Population Centers
- Lakes, Ponds, Wetlands
- Rivers
- Named Creeks
- State, Local, Private

0 0.5 1 2
Miles

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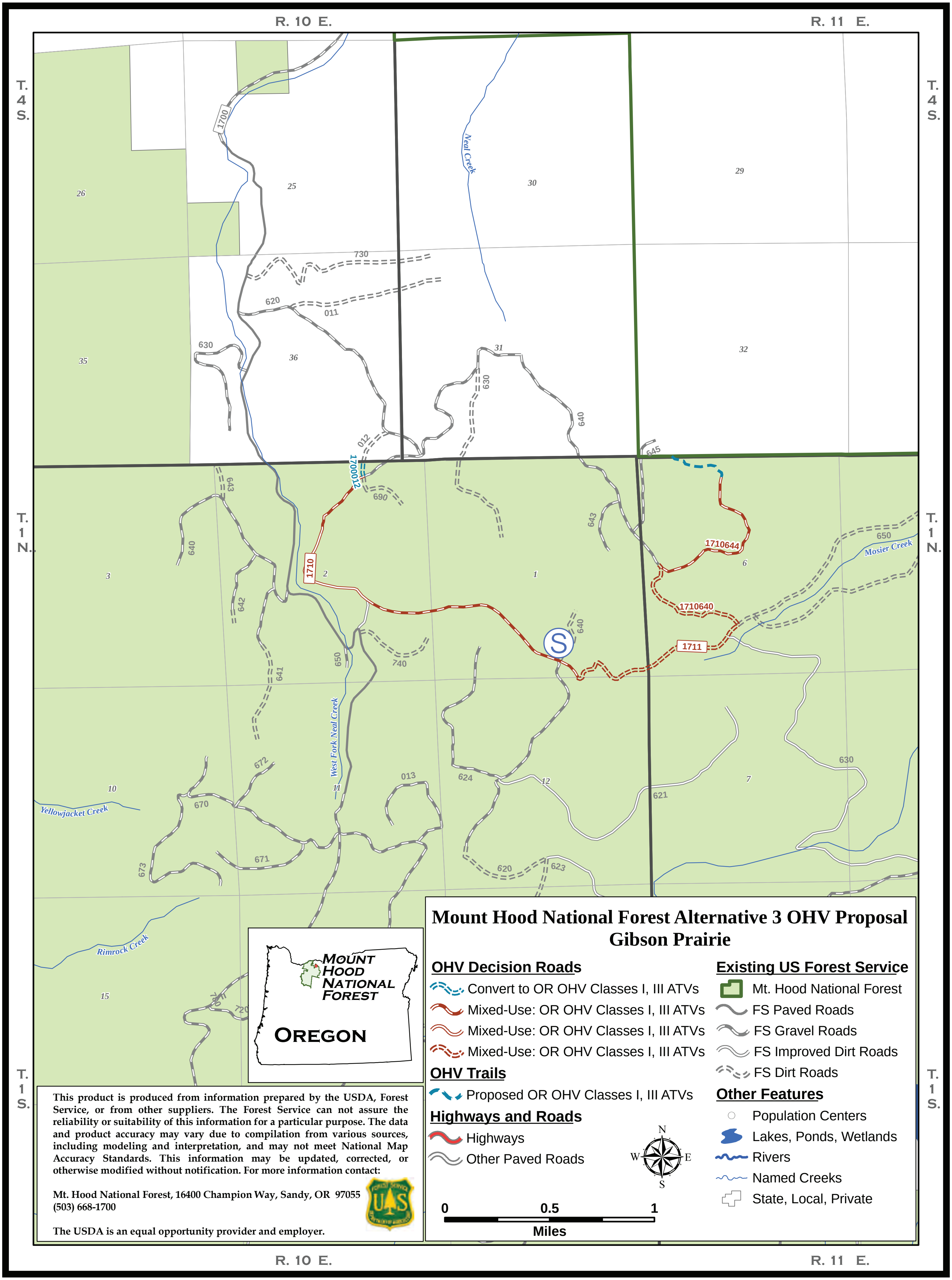

Mount Hood National Forest Alternative 3 OHV Proposal
Gibson Prairie

OHV Decision Roads
- Convert to OR OHV Classes I, III ATVs
- Mixed-Use: OR OHV Classes I, III ATVs
- Mixed-Use: OR OHV Classes I, III ATVs
- Mixed-Use: OR OHV Classes I, III ATVs

OHV Trails
- Proposed OR OHV Classes I, III ATVs

Highways and Roads
- Highways
- Other Paved Roads

Existing US Forest Service
- Mt. Hood National Forest
- FS Paved Roads
- FS Gravel Roads
- FS Improved Dirt Roads
- FS Dirt Roads

Other Features
- Population Centers
- Lakes, Ponds, Wetlands
- Rivers
- Named Creeks
- State, Local, Private

N S W E

0 0.5 1
Miles

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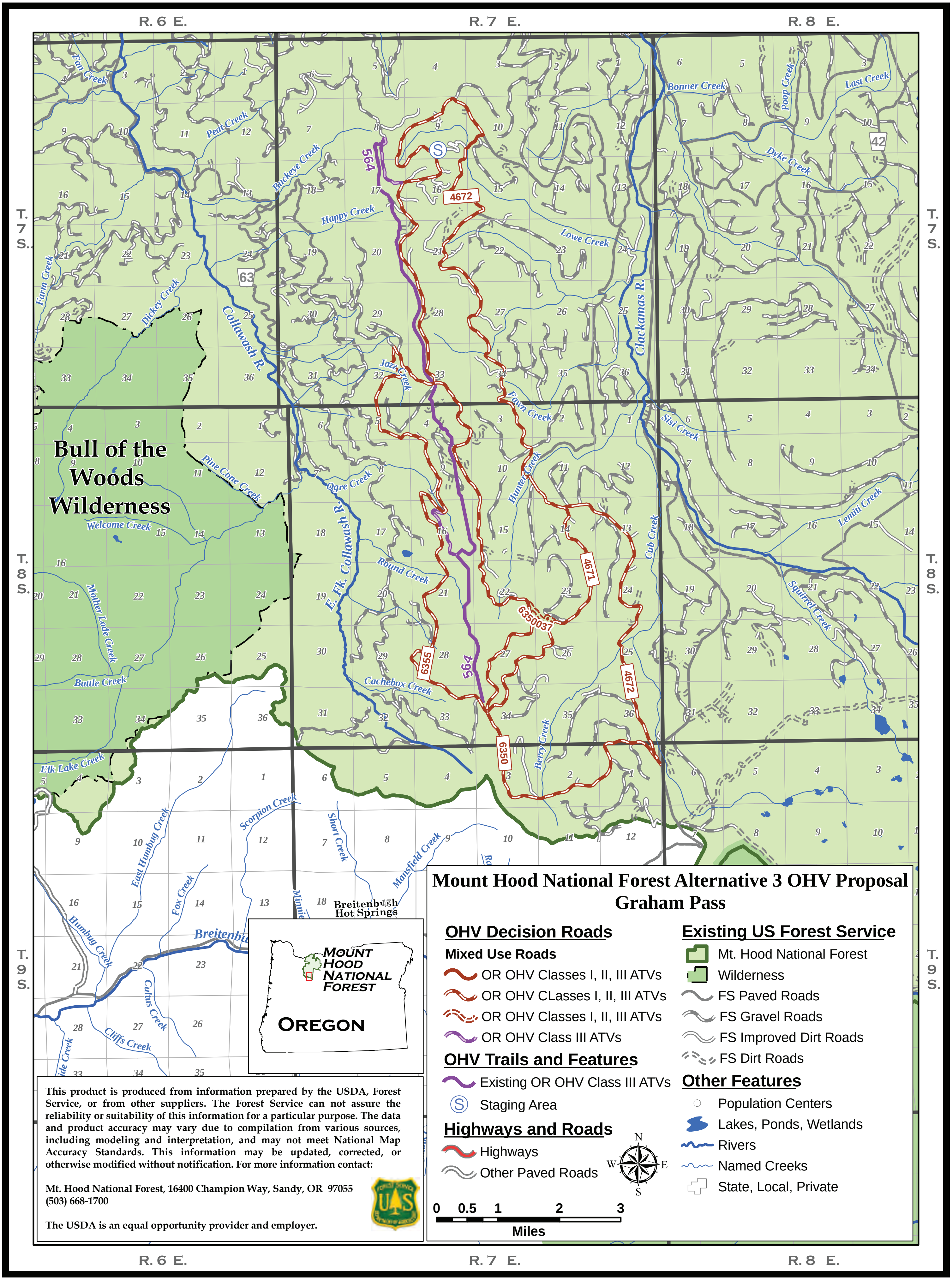

Mount Hood National Forest Alternative 3 OHV Proposal
Graham Pass

OHV Decision Roads

Mixed Use Roads

- OR OHV Classes I, II, III ATVs
- OR OHV CLasses I, II, III ATVs
- OR OHV Classes I, II, III ATVs
- OR OHV Class III ATVs

OHV Trails and Features

- Existing OR OHV Class III ATVs
- Staging Area

Highways and Roads

- Highways
- Other Paved Roads

Existing US Forest Service

- Mt. Hood National Forest
- Wilderness
- FS Paved Roads
- FS Gravel Roads
- FS Improved Dirt Roads
- FS Dirt Roads

Other Features

- Population Centers
- Lakes, Ponds, Wetlands
- Rivers
- Named Creeks
- State, Local, Private

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Miles

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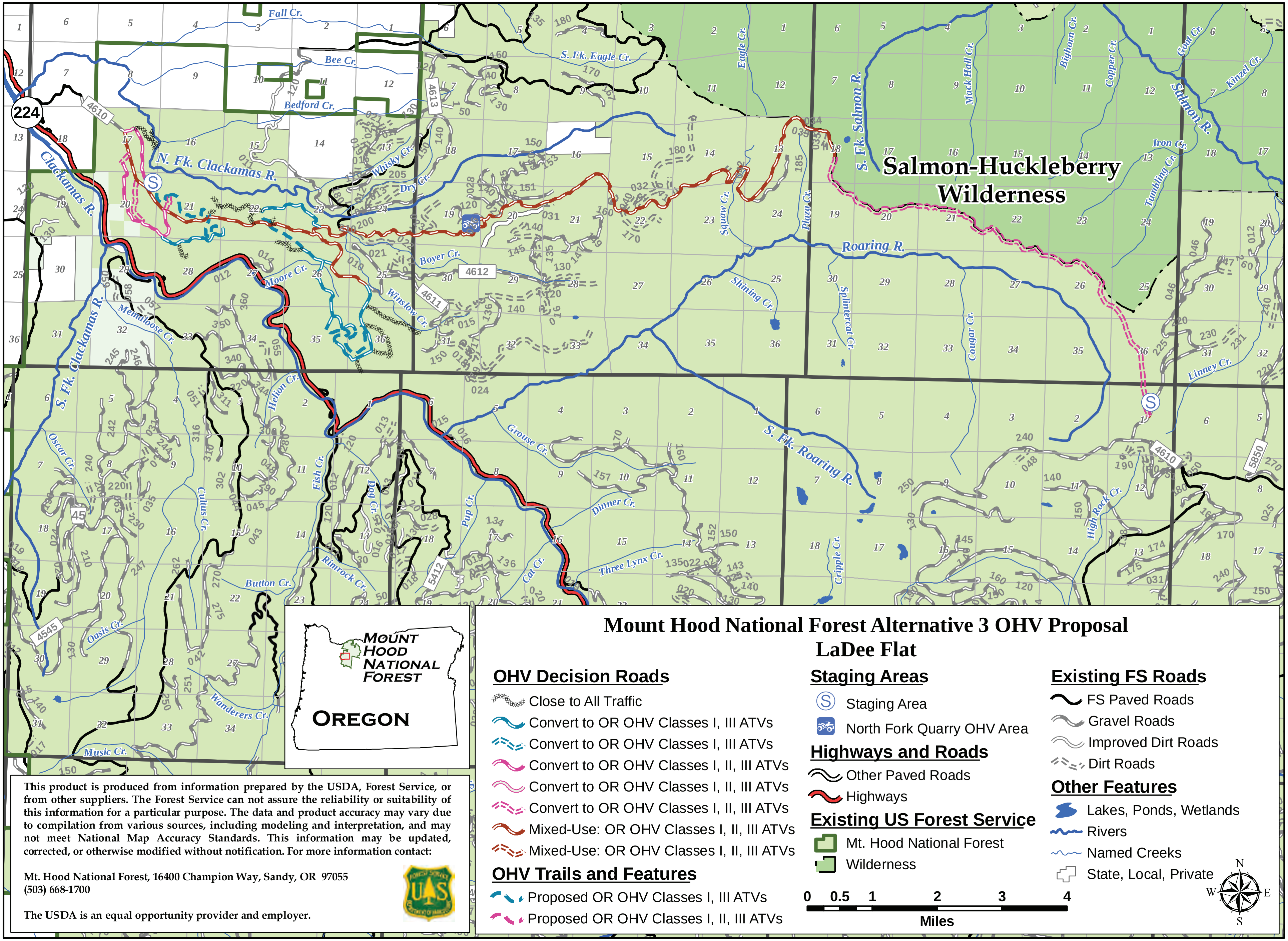

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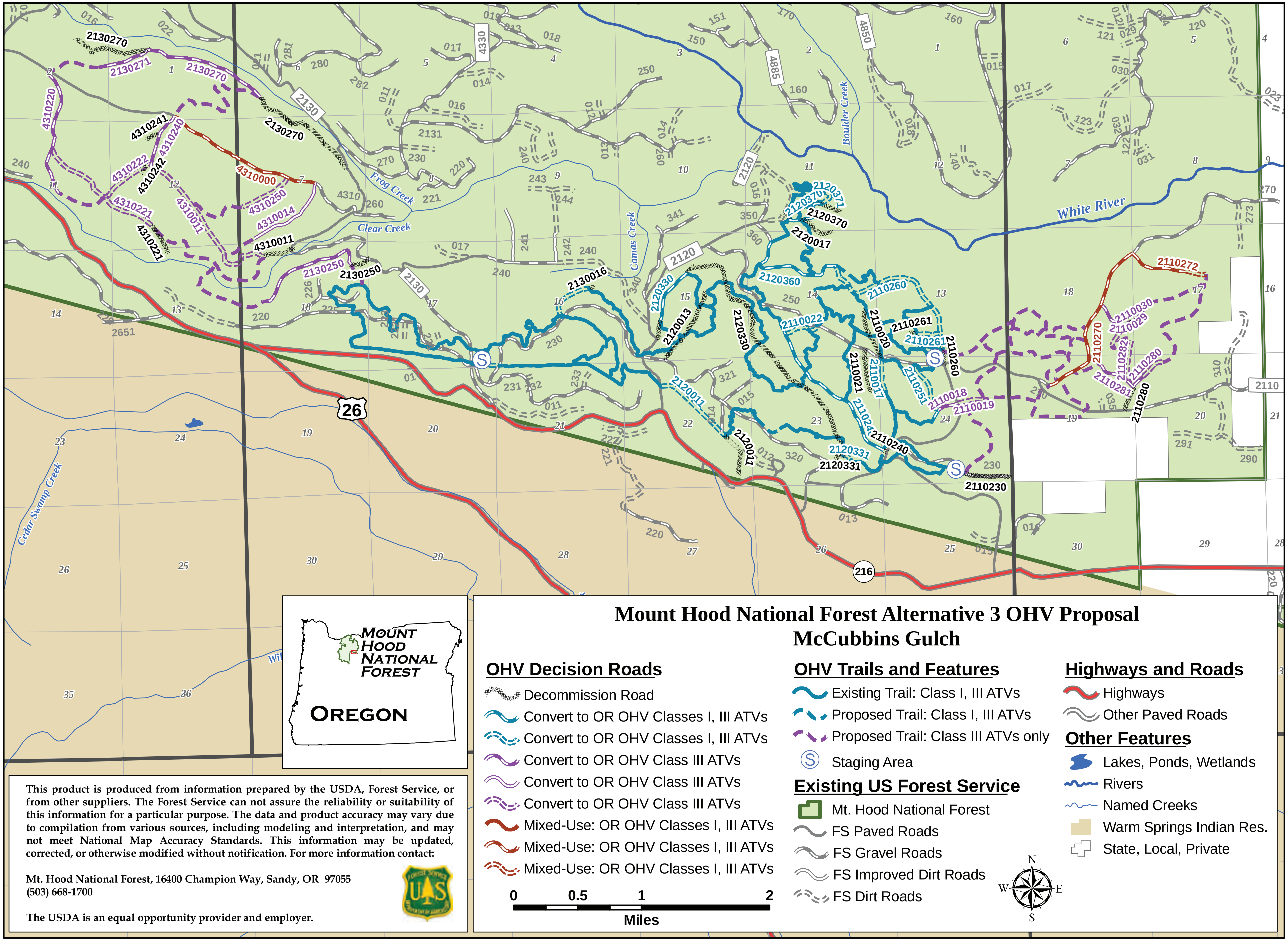
Mount Hood National Forest Alternative 3 OHV Proposal
McCubbins Gulch
R. 9 E.
R. 10 E.
R. 11 E.
T. 5 S.
T. 6 S.
White River
Boulder Creek
Camas Creek
Frog Creek
Clear Creek
Cedar Swamp Creek
OHV Decision Roads
Decommission Road
Convert to OR OHV Classes I, III ATVs
Convert to OR OHV Classes I, III ATVs
Convert to OR OHV Class III ATVs
Convert to OR OHV Class III ATVs
Convert to OR OHV Class III ATVs
Mixed-Use: OR OHV Classes I, III ATVs
Mixed-Use: OR OHV Classes I, III ATVs
Mixed-Use: OR OHV Classes I, III ATVs
OHV Trails and Features
Existing Trail: Class I, III ATVs
Proposed Trail: Class I, III ATVs
Proposed Trail: Class III ATVs only
Staging Area
Existing US Forest Service
Mt. Hood National Forest
FS Paved Roads
FS Gravel Roads
FS Improved Dirt Roads
FS Dirt Roads
Highways and Roads
Highways
Other Paved Roads
Other Features
Lakes, Ponds, Wetlands
Rivers
Named Creeks
Warm Springs Indian Res.
State, Local, Private
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Mount Hood National Forest
Oregon
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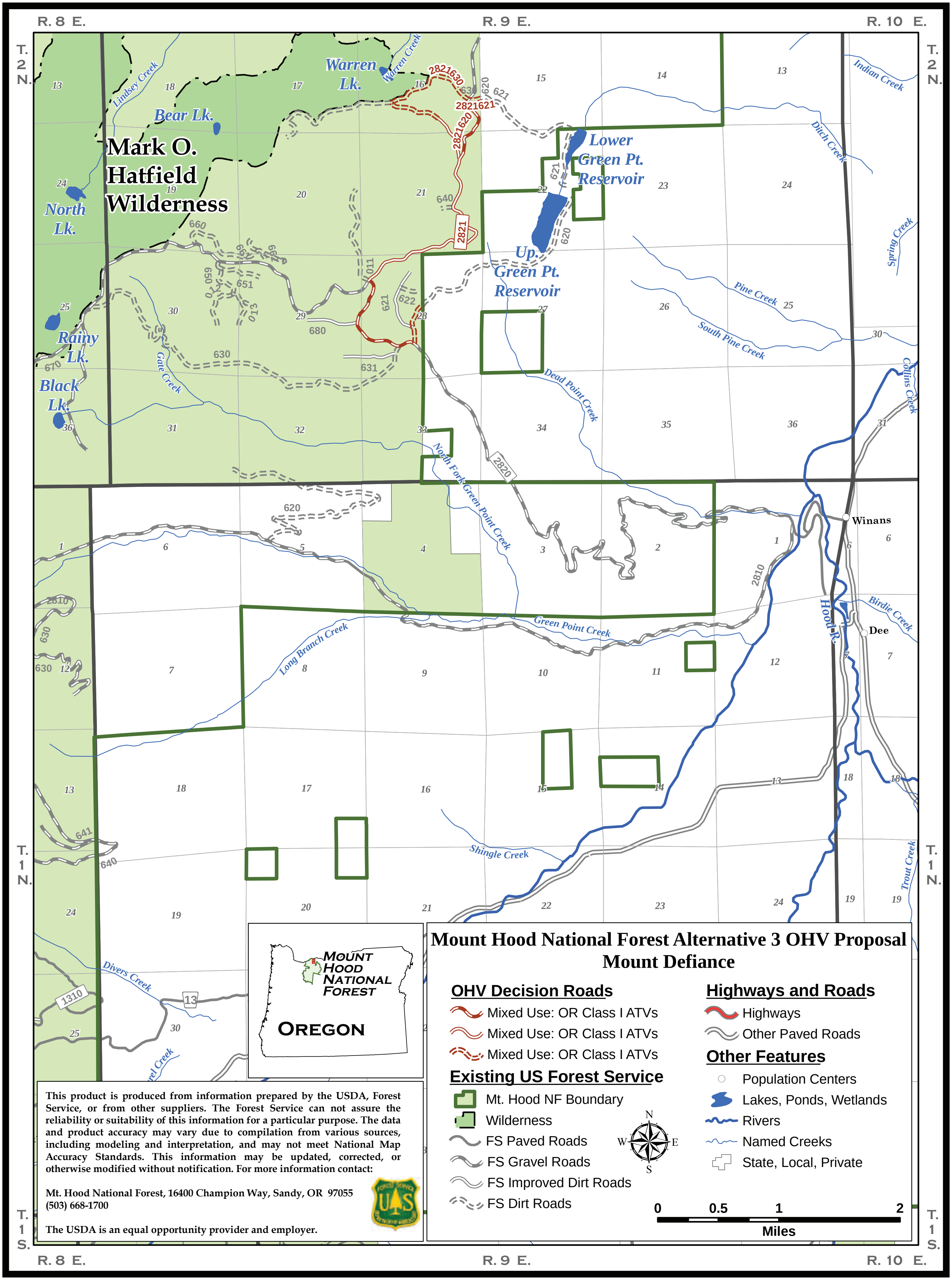
Mount Hood National Forest Alternative 3 OHV Proposal
Mount Defiance
OHV Decision Roads
Mixed Use: OR Class I ATVs
Mixed Use: OR Class I ATVs
Mixed Use: OR Class I ATVs
Existing US Forest Service
Mt. Hood NF Boundary
Wilderness
FS Paved Roads
FS Gravel Roads
FS Improved Dirt Roads
FS Dirt Roads
Highways and Roads
Highways
Other Paved Roads
Other Features
Population Centers
Lakes, Ponds, Wetlands
Rivers
Named Creeks
State, Local, Private
0
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Miles
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Mount Hood National Forest
Oregon
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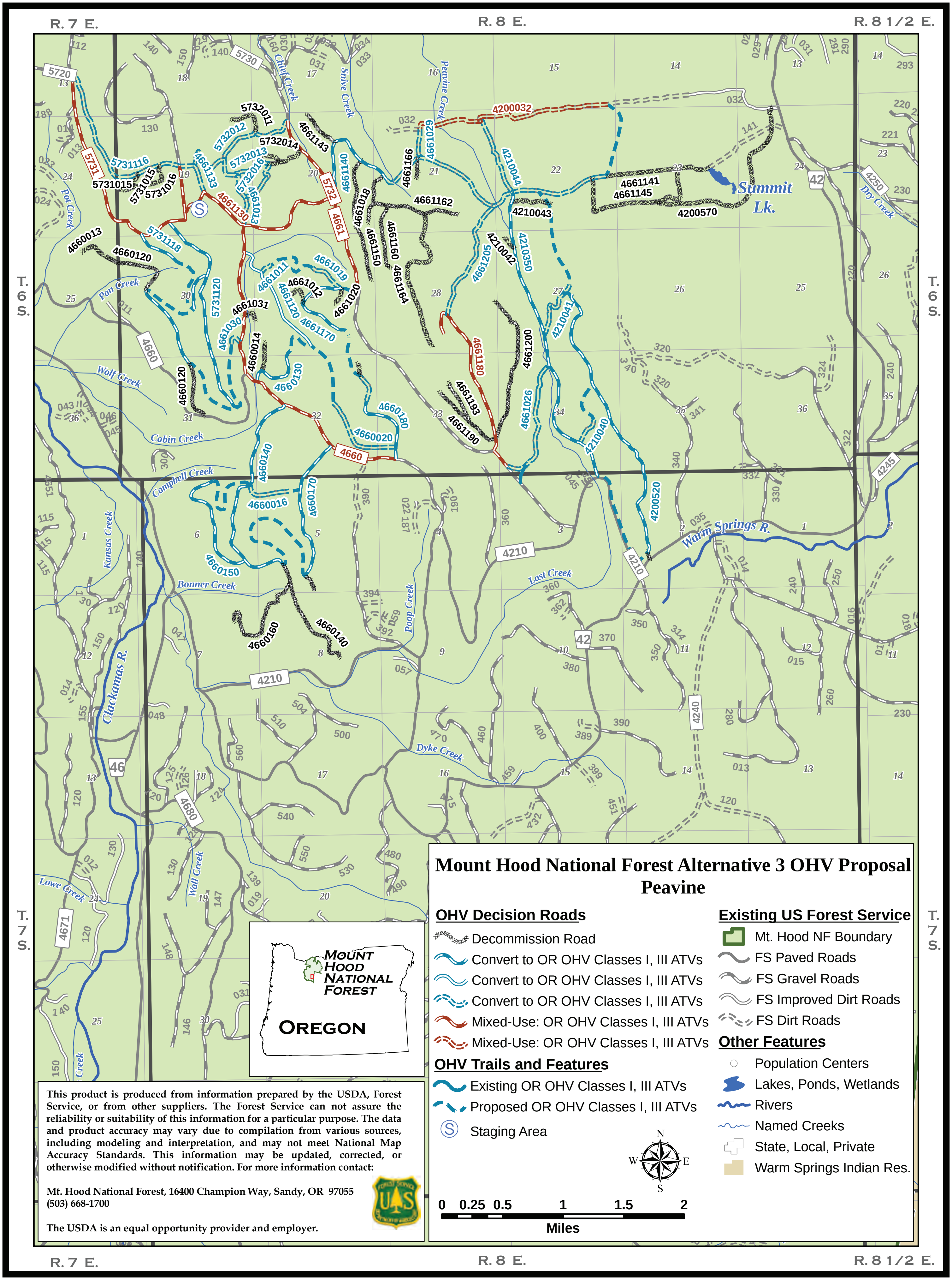
R. 8 E.
R. 9 E.
R. 10 E.
T. 2 N.
T. 1 N.
T. 1 S.
Mark O. Hatfield Wilderness
Warren Lk.
Bear Lk.
North Lk.
Rainy Lk.
Black Lk.
Lower Green Pt. Reservoir
Up. Green Pt. Reservoir
Winans
Dee
Hood R.
Warren Creek
Lindsey Creek
Indian Creek
Ditch Creek
Spring Creek
Pine Creek
South Pine Creek
Dead Point Creek
Collins Creek
Gate Creek
North Fork Green Point Creek
Green Point Creek
Long Branch Creek
Birdie Creek
Shingle Creek
Trout Creek
Divers Creek
2821630
2821621
2821620
2821
2820
2810
1310



Mount Hood National Forest Alternative 3 OHV Proposal Peavine

OHV Decision Roads

- Decommission Road
- Convert to OR OHV Classes I, III ATVs
- Convert to OR OHV Classes I, III ATVs
- Convert to OR OHV Classes I, III ATVs
- Mixed-Use: OR OHV Classes I, III ATVs
- Mixed-Use: OR OHV Classes I, III ATVs

OHV Trails and Features

- Existing OR OHV Classes I, III ATVs
- Proposed OR OHV Classes I, III ATVs
- Staging Area

Existing US Forest Service

- Mt. Hood NF Boundary
- FS Paved Roads
- FS Gravel Roads
- FS Improved Dirt Roads
- FS Dirt Roads

Other Features

- Population Centers
- Lakes, Ponds, Wetlands
- Rivers
- Named Creeks
- State, Local, Private
- Warm Springs Indian Res.

0 0.25 0.5 1 1.5 2
Miles

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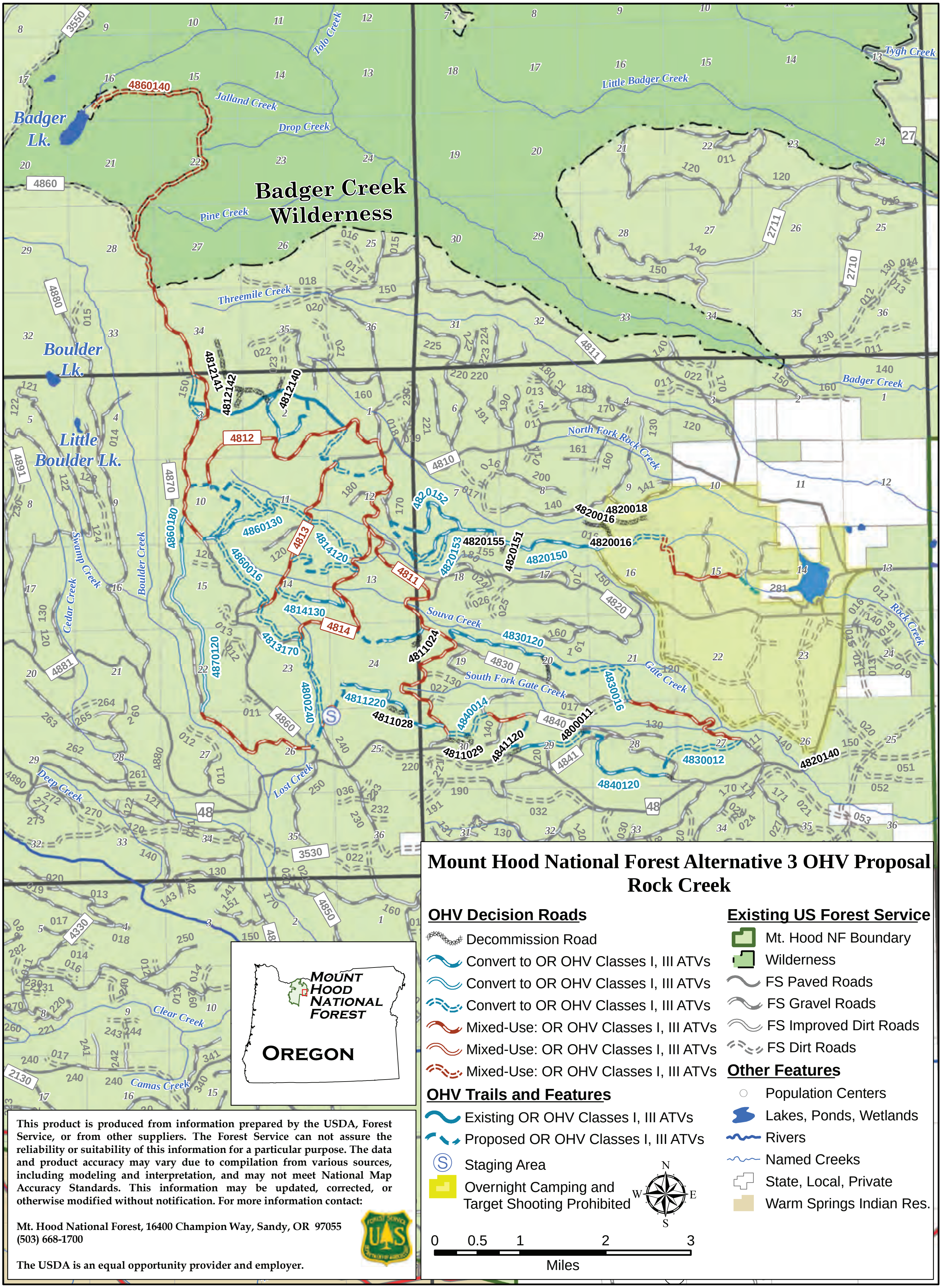

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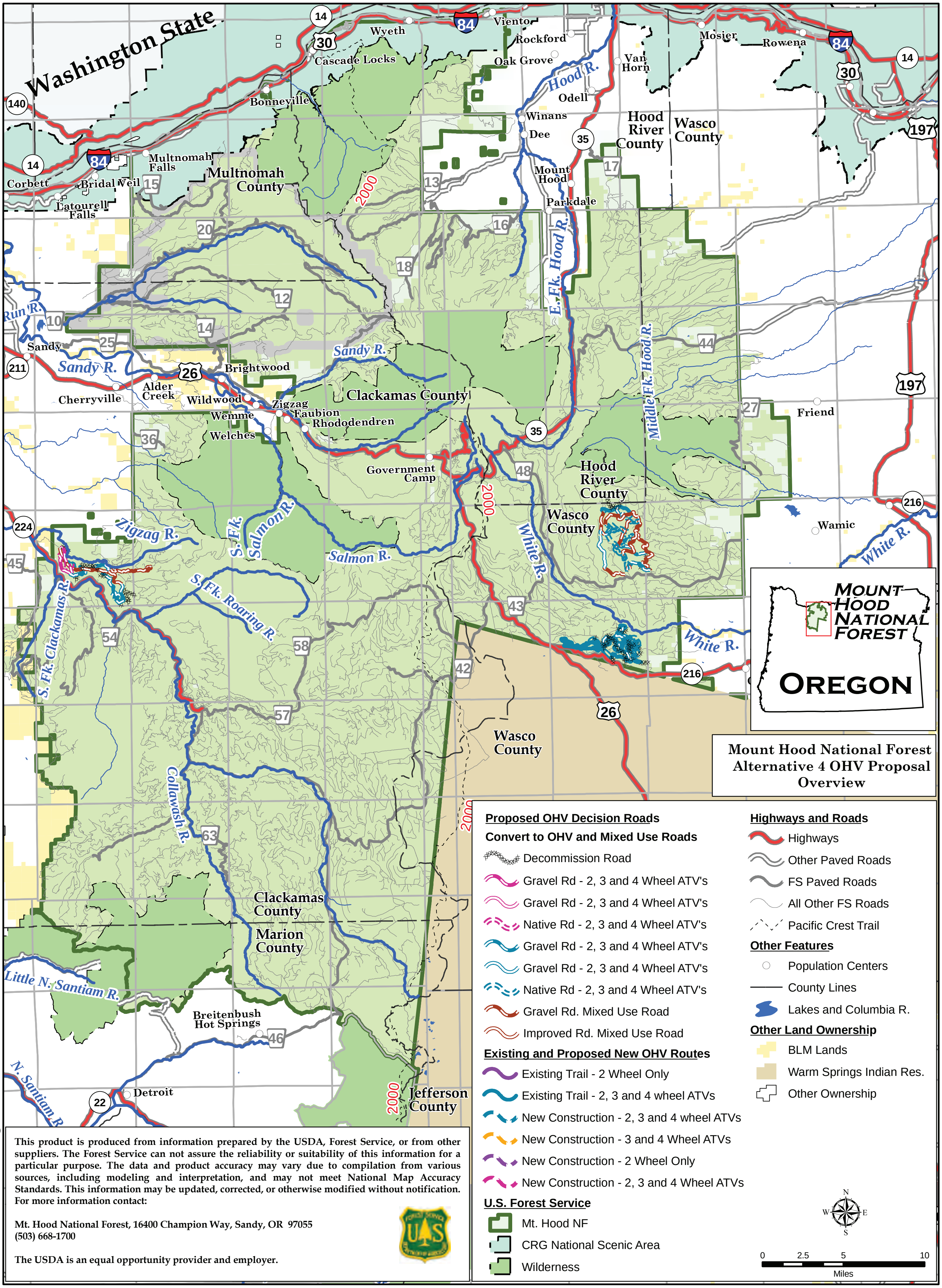

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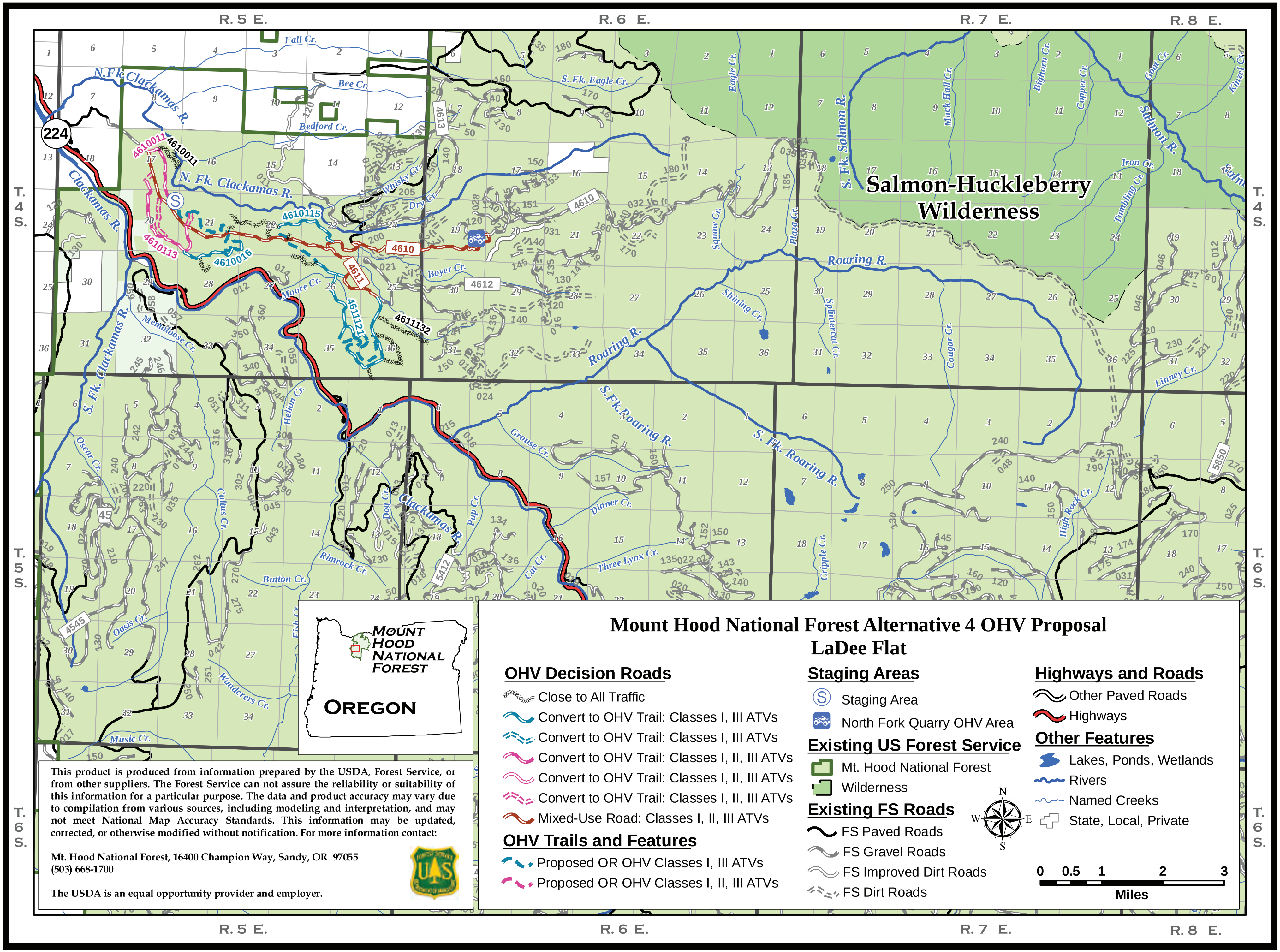

Mount Hood National Forest Alternative 4 OHV Proposal
LaDee Flat
OHV Decision Roads
Close to All Traffic
Convert to OHV Trail: Classes I, III ATVs
Convert to OHV Trail: Classes I, III ATVs
Convert to OHV Trail: Classes I, II, III ATVs
Convert to OHV Trail: Classes I, II, III ATVs
Convert to OHV Trail: Classes I, II, III ATVs
Mixed-Use Road: Classes I, II, III ATVs
OHV Trails and Features
Proposed OR OHV Classes I, III ATVs
Proposed OR OHV Classes I, II, III ATVs
Staging Areas
Staging Area
North Fork Quarry OHV Area
Existing US Forest Service
Mt. Hood National Forest
Wilderness
Existing FS Roads
FS Paved Roads
FS Gravel Roads
FS Improved Dirt Roads
FS Dirt Roads
Highways and Roads
Other Paved Roads
Highways
Other Features
Lakes, Ponds, Wetlands
Rivers
Named Creeks
State, Local, Private
0 0.5 1 2 3
Miles
N S E W
Mount Hood National Forest
Oregon
Salmon-Huckleberry Wilderness
R. 5 E.
R. 6 E.
R. 7 E.
R. 8 E.
T. 4 S.
T. 5 S.
T. 6 S.
N. Fk. Clackamas R.
Clackamas R.
S. Fk. Clackamas R.
Roaring R.
S. Fk. Roaring R.
S. Fk. Salmon R.
Salmon R.
4610
4611
4612
4613
4610011
4610113
4610115
4610016
4611121
4611132
224
45
5412
4545
5850
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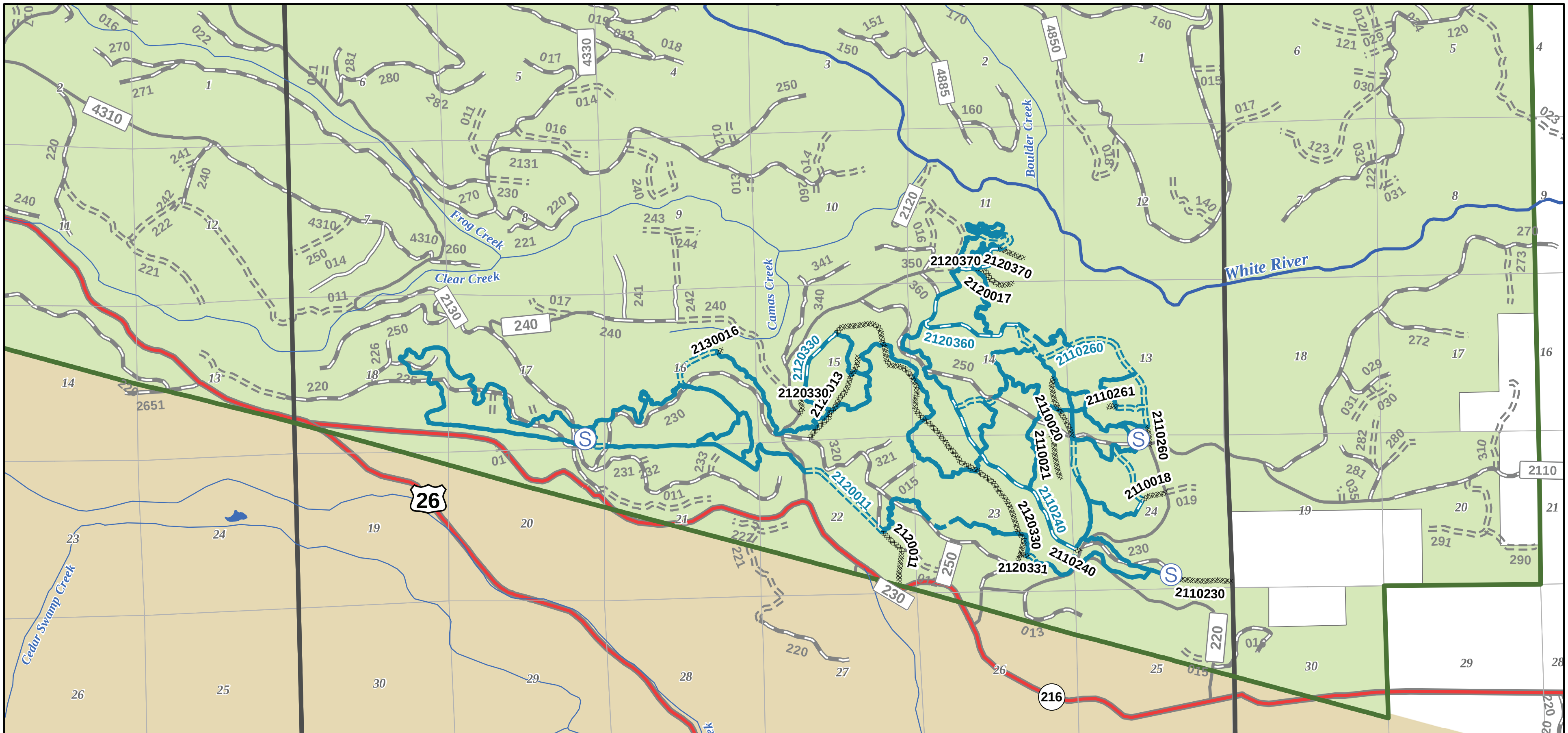

Mount Hood National Forest Alternative 4 OHV Proposal
McCubbins Gulch

OHV Decision Roads
- Decommission Road
- Convert to OR OHV Classes I, III ATVs
- Convert to OR OHV Classes I, III ATVs

OHV Trails and Features
- Existing OR OHV Classes I, III ATVs
- Proposed OR OHV Classes I, III ATVs
- Staging Area

Existing US Forest Service
- Mt. Hood National Forest
- FS Paved Roads
- FS Gravel Roads
- FS Improved Dirt Roads
- FS Dirt Roads

Other Features
- Lakes, Ponds, Wetlands
- Rivers
- Named Creeks
- Warm Springs Indian Res.
- State, Local, Private

0 0.5 1 2
Miles

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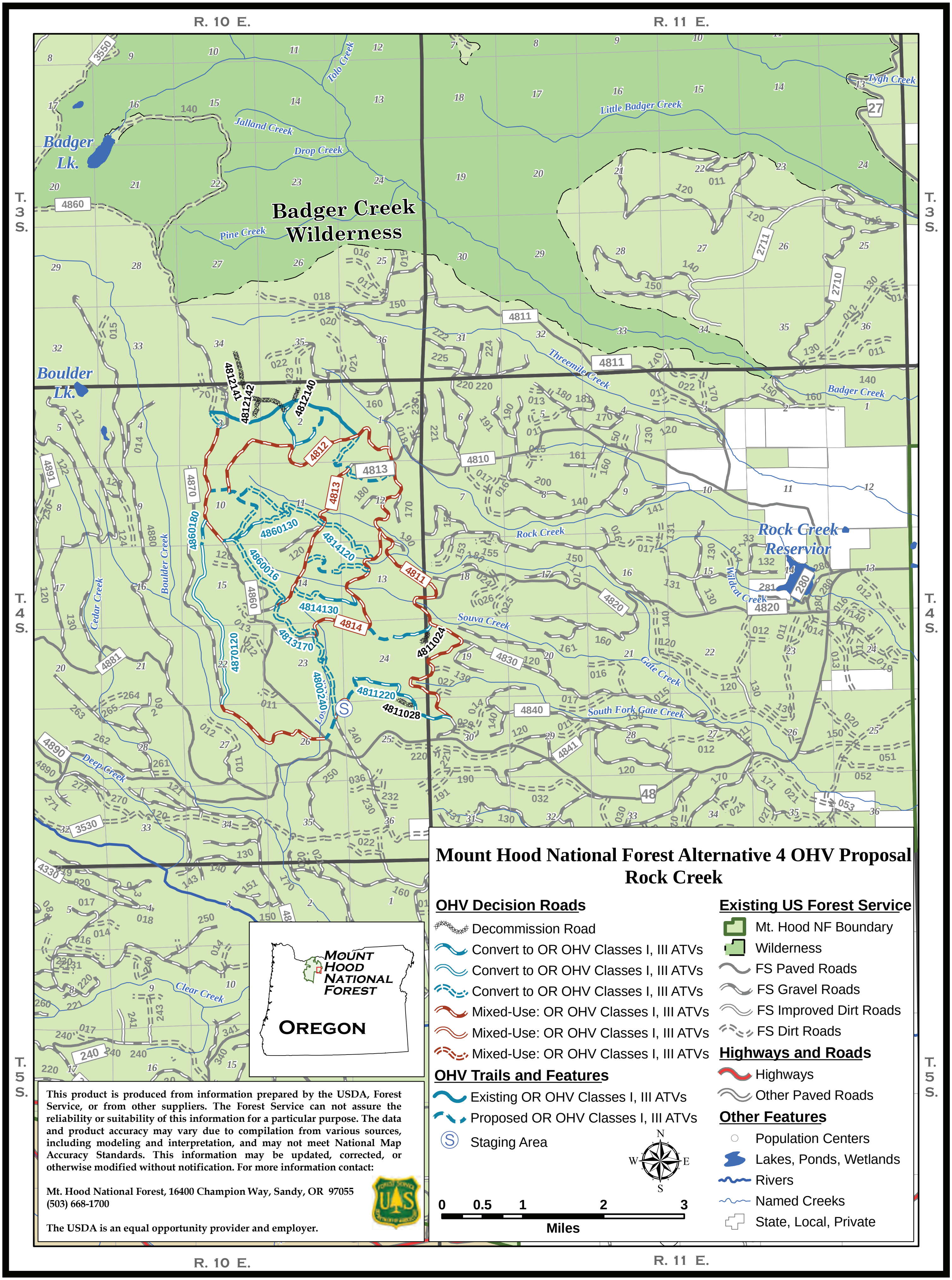

Mount Hood National Forest Alternative 4 OHV Proposal
Rock Creek

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Appendix B

APPENDIX B: Mt. Hood National Forest Land and Resource Management Plan (1990) Appendix C – Access and Travel Management Guide Summary

Land Allocation	Acceptable OHV Use
A2 – Wilderness	None acceptable
A3 – Research Natural Areas	**ML1** – None acceptable **ML2** – Non-License Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same ML2 plus Passenger vehicles **Trails** – None acceptable **Areas** – None acceptable
A4 – Special Interest Areas	**ML1** – None acceptable **ML2** – Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same ML2 plus Passenger vehicles **Trails** – None acceptable **Areas** – None acceptable
A5 – Unroaded Recreation	**ML1** – None acceptable **ML2** – Non-License Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same ML2 plus Passenger vehicles **Trails** – None acceptable **Areas** – None acceptable
A6 – Semi-primitive Roaded	**ML1** – None acceptable **ML2** – Non-License Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Non-License Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s), Passenger vehicles **Trails** – Non-License Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **Areas** – Non-License Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-licensed Motorized Trailbike, High Clearance Vehicles (4x4s)
A7 – Special Old Growth	**ML1** – None acceptable **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike **ML 3-5** – Same ML2 plus High Clearance Vehicles (4x4s) and Passenger vehicles **Trails** – None acceptable **Areas** – None acceptable
A8 – Northern Spotted Owl	**ML1** – Winter Use **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s)

Land Allocation	Acceptable OHV Use
A8 – Northern Spotted Owl	**ML 3-5** – Same ML2 plus Summer Use Class 1 ATV, Class 3 Non-license Motorized Trailbike, and Passenger vehicles **Trails** – SEASONAL RESTRICTIONS for Non-license Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-licensed motorized Trailbike, High Clearance Vehicles (4x4s), Winter Use **Areas** – None acceptable
A9-Key Site Riparian	**ML1** – Winter Use **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same ML2 plus Summer Use Class 1 ATV, Class 3 Non-license Motorized Trailbike, and Passenger vehicles **Trails** – Winter Use **Areas** – Winter Use
A10-Developed Recreation	**ML1** – SEASONAL RESTRICTIONS for Winter Use **ML2** – Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same ML2 plus Passenger vehicles **Trails** – SEASONAL RESTRICTIONS for Winter Use **Areas** – SEASONAL RESTRICTIONS for Winter Use
A11-Winter Recreation Areas	**ML1** – None acceptable **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same ML2 plus Passenger vehicles **Trails** – Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-Licensed Motorized Trailbike, Winter Use **Areas** – Winter Use
A12-Outdoor Education	**ML1** – SEASONAL RESTRICTION for Winter Use **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same ML2 plus Passenger vehicles **Trails** – Winter Use **Areas** – Winter Use
A13-Bald Eagle Recovery Area	**ML1** – Winter Use **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Non-licensed Class 2, High Clearance Vehicles (4x4s), Passenger Vehicles **Trails** – Summer Use Class 1 ATV, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s), Winter Use **Areas** – None Acceptable
B1-Wild, Scenic and Recreational Rivers – Wild Segments	**ML1** – None Acceptable **ML2** – None Acceptable **ML 3-5** – None Acceptable **Trails** – None Acceptable **Areas** – None Acceptable

Land Allocation	Acceptable OHV Use
B1-Wild, Scenic and Recreational Rivers – Scenic Segments	**ML1** – None Acceptable **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same as ML2, plus Passenger Vehicles **Trails** – Non-license Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-license Motorized Trailbike, High Clearance Vehicles (4x4s) **Areas** – Same as trails, plus Winter Use
B1-Wild, Scenic and Recreational Rivers – Recreational Segments	**ML1** – None Acceptable **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same as ML2, plus Passenger Vehicles **Trails** – Non-license Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-license Motorized Trailbike, High Clearance Vehicles (4x4s), Winter Use **Areas** – Same as trails, plus Passenger Vehicles
B2-Scenic Viewsheds	**ML1** – None Acceptable **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same as ML2, plus Passenger Vehicles **Trails** – Non-license Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-license Motorized Trailbike, High Clearance Vehicles (4x4s), Winter Use **Areas** – Same as trails
B3-Roaded Recreation	**ML1** – Winter Use **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same as ML2, plus Passenger Vehicles **Trails** – Non-license Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-license Motorized Trailbike, High Clearance Vehicles (4x4s), Winter Use **Areas** – Same as trails
B4-Pine Oak Habitat	**ML1** – Winter Use **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s), Passenger Vehicles **ML 3-5** – Same as ML2 **Trails** – Non-license Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-license Motorized Trailbike, High Clearance Vehicles (4x4s), Winter Use **Areas** – None Acceptable
B5-Pileated Woodpecker / Pine Martin Habitat	**ML1** – Winter Use **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same as ML2, plus Passenger Vehicles **Trails** – Non-license Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-license Motorized Trailbike, High Clearance Vehicles (4x4s) **Areas** – None Acceptable

Land Allocation	Acceptable OHV Use
B6-Special Emphasis Watershed	**ML1** – None Acceptable **ML2** – None Acceptable **ML 3-5** – Non-license Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s), Passenger Vehicles **Trails** – None Acceptable **Areas** – None Acceptable
B7-General Riparian Areas	**ML1** – None Acceptable **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same as ML2, plus Passenger Vehicles **Trails** – Non-license Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-license Motorized Trailbike, High Clearance Vehicles (4x4s), Winter Use **Areas** – None Acceptable
B8-Earthflows	**ML1** – Winter Use **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same as ML2, plus Passenger Vehicles **Trails** – Non-license Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-license Motorized Trailbike, High Clearance Vehicles (4x4s), Winter Use **Areas** – None Acceptable
B9-Wildlife Visuals	**ML1** – None Acceptable **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same as ML2, plus Passenger Vehicles **Trails** – None Acceptable **Areas** – None Acceptable
B10-Deer and Elk Winter Range	**ML1** – None Acceptable **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same as ML2, plus Passenger Vehicles **Trails** – Non-license Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-license Motorized Trailbike, High Clearance Vehicles (4x4s), Winter Use **Areas** – None Acceptable
B11-Deer and Elk Summer Range	**ML1** – Licensed Motorized Trailbike, Winter Use **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Non-licensed Class 2, High Clearance Vehicles (4x4s), Passenger Vehicles **Trails** – Winter Use **Areas** – Winter Use
B12-Back County Lakes	**ML1** – Winter Use **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s)

Land Allocation	Acceptable OHV Use
B12-Back County Lakes	**ML 3-5** – Same as ML2, plus Passenger Vehicles **Trails** – Non-license Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-license Motorized Trailbike, High Clearance Vehicles (4x4s), Winter Use **Areas** – Same as trails
C1-Timber Emphasis	**ML1** – Winter Use **ML2** – Non-licensed Class 2, Licensed Motorized Trailbike, High Clearance Vehicles (4x4s) **ML 3-5** – Same as ML2, plus Passenger Vehicles **Trails** – Non-license Class 2, Summer Use Class 1 ATV, Licensed Motorized Trailbike, Class 3 Non-license Motorized Trailbike, Winter Use **Areas** – Same as trails
D-Bull Run	**This area is closed to public entry by law.**

Definitions and Explanations in Forest Plan:

Class 1 All-terrain Vehicles (ATVs)	Motorized off-highway recreational vehicle that is 50 inches or less in width having a dry weight of less than 600 ponds which travels on three or more low-pressure tires and having a saddle.
Class 2 ATVs	Vehicle weighing more than 600 pounds and less than 8,000 pounds, able to travel cross-county on or over land, water, sand, snow, ice, march, swampland or other natural terrain, and actually being operated off a highway (e.g., dune buggies, jeeps or other 4x4s). Many Class 2 ATVs are registered as passenger car or street level vehicle.
Class 3 ATVs	Motorized off-highway vehicle having a dry weight of less than 600 pounds which travels on two tires (off-road motor cycles).
Maintenance Level 1 (ML1)	Roads are not maintained for motor vehicle use and area closed to vehicle traffic. They may be used for foot or horse travel [FSH 7709 12.3(2a)].
Maintenance Level 2 (ML2)	Roads are maintained for high-clearance vehicle use and are not maintained for public passenger car travel. These roads may be used by Forest visitors unless specifically prohibited. Passenger car use is discouraged [FSH 7709 12.3(2b)].
Maintenance Level 3 (ML3)	Roads in this and higher maintenance levels are subject to the applicable standards of Highway Safety Act. They are maintained to be passable for public passenger cars operated at prudent driving speeds [FSH 7709 12.3 (2c,d,e)].
Seasonal Restriction	Identify that the specific designation applies except in some site specific circumstances. These circumstances could include a particular resource activity or physical condition causing a hazardous or life threatening condition, or considerable adverse effects on Forest resource might occur.

Appendix C
Oregon State Regulations

OREGON OFF-ROAD VEHICLES
SNOWMIBILES; ALL-TERRAIN VEHICLES

Oregon Revised Statute Chapter 821 (2003) **with applicable 36 CFR**

Selected and Abbreviated *Italic text added for clarification*

See 36 CFR 261.13 for General Prohibitions Web site for ORS www.leg.state.or.us/ors

DEFINITIONS

801.190 "Class I all-terrain vehicle" *(3-4 wheel OHV)* means a motorized, off-highway recreational vehicle 50 inches or less in width with a dry weight of 800 pounds or less that travels on three or more low pressure tires, has a saddle or seat for the operator, and is designed for or capable of cross-country travel.

801.193 "Class II all-terrain vehicle" *(jeep, pickup)* any motor vehicle that:
(1) Weighs more than a Class I all-terrain vehicle and less than 8,000 pounds; (2) Designed for/capable of cross-country travel; and (3) Being used off highway.

801.194 "Class III all-terrain vehicle" *(Motorcycle)* means an off-highway motorcycle with a dry weight of 600 pounds or less that travels on two tires.

801.490 "Snowmobile" means a self-propelled vehicle that:
(1) Capable of travel over snow/ ice; (2) Propulsion by endless belt tread or cleats or any combination of, or similar means upon which it is operated;
(3) Steers wholly/in part by skis/runners; (4) Not registered as other type vehicle.

801.305 "Highway" is every public way, road, street, thoroughfare, place, bridge, viaduct, open, used/intended for use of general public for vehicular traffic.

GENERAL ON ROAD MOTOR VEHICLES

For motor vehicles used **on** *National Forest System roads and Class II ATV Operated On or Off National Forest System roads*

REGISTRATION *(Vehicle License)*
803.300 Fail to register D Traffic violation
803.505 Fail to carry registration D Traffic violation
803.560 Display Expired Sticker D Traffic violation

FINANCIAL RESPONSIBILITY *(Vehicle Insurance)*
806.010 Driving Uninsured; B Traffic violation
806.012 Fail to carry proof off insurance; B Traffic violation
806.020 Exemptions from financial responsibility requirements.
(6) A snowmobile, Class I or Class III ATV. (*Note Class II ATV is not exempt)*
(7) Except continuously not being operated on road & form submitted to DOT

LICENSES, INDORSEMENTS & PERMITS *(Drivers License)*
807.010 Operating vehicle without driving privilege B Traffic violation
807.035(1) Operate Motorcycle without endorsement ORS 807.010 B Traffic
811.175 Driving while suspended or revoked
Operator is in violation of ORS 811.175 (A Traffic violation) or ORS 811.182 (C Felony / A Misdemeanor)

HELMETS – MOTORCYCLE & MOPEDS
814.260 Failure of moped operator to wear motorcycle helmet D Traffic
814.269 Failure of motorcycle operator to wear motorcycle helmet. D Traffic
814.275 Failure of motorcycle passenger to wear motorcycle helmet D Traffic
814.280 Endanger motorcycle passenger not wear motorcycle helmet D Traffic

GENERAL AREAS OF OPERATION

821.020 Applicability of off-road vehicle exemption from general equipment
(1) Any land/road/place in State that meets following & not posted closed to ATV.
(a) Lands which are open to the public.
(b) Roads, other than two-lane gravel roads, which are open to the public.
(c) Paved parking lots adjacent to or on designated off-road vehicle areas.
(d) Any local two-lane gravel road that is open to the public and that is designated by the road authority with jurisdiction over the road as open to ORV.

821.055 Operation of ATV on certain highways. Class I, II, III ATV may operate on a highway open to the public & not maintained for passenger car traffic.

OREGON OFF-ROAD VEHICLES
SNOWMIBILES; ALL-TERRAIN VEHICLES

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PROHIBITED AREAS

Specific areas of National Forest System Lands may be closed to the use of Off-Road Vehicles. Check at the local Forest Service Officer for specific prohibitions.

821.190 Unlawful operation of snowmobile or ATV on highway or railroad.

(1) Unlawful operation of an ATV in any of the following described areas:
- (a) On/across **paved** portion, shoulder, inside bank or slope of highway, on / across median of highway or on / across highway right of way under construction.
- (b) On or across a railroad right of way.

821.200 Exemptions on operating on highway or railroad (snowmobile/all ATVs)

(1) Highways & Railroads:
- (a) At 90 degrees angle. (b) and Place where quick & safe. (c) and Come to stop. (d) and Yield right of way.
- (f) and 100+ feet from intersection. (g) and under 12 year old on snowmobile or Class I must be accompanied by 18+ year old on same/like vehicle.

(2) Highways:
- (a) Highway completely covered with snow/ice & closed to other motor vehicles. (b) Loading/unloading without causing hazard.
- (c) Posted to permit snowmobile / ATV use. (d) Emergency when snow renders other travel impractical.
- (e) Traveling on designated snowmobile / ATV trail.

(3) Railroads:
- (a) Posted to permit the operation. (b) Emergency. (c) Officer or employee or authorized contractor or agent of the railroad.

821.250 Permitting dangerous operation of snowmobile or ATV;
(1) Owner/person w/ control of machine permits operator across highway who is:
- (a) Incapable by reason of age, physical or mental disability; (b) Under the influence of intoxicating liquor, inhalants or controlled substances.

821.295 Operating Class II or Class III ATV in prohibited snow area;
(1) Operating vehicle in a prohibited snow area on a groomed trail or a designated snowmobile or cross country ski trail or area during a designated snow use period.

PROHIBITED OPERATION

821.192 Operating ATV in violation of posted restrictions. B Traffic violation

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821.240 Operating snowmobile or ATV while carrying firearm/bow; (1) Unless the firearm is unloaded *(no ammo in gun)*, or all arrows are in a quiver.

821.250 Permitting dangerous operation of snowmobile or ATV; (1) Owner/person w/ control of machine permits operator across highway who is:
- (a) Incapable by reason of age, physical or mental disability; or (b) Under the influence of intoxicating liquor, inhalants or controlled substances.

821.260 Hunting or harassing animals from snowmobile or ATV; *(Actively hunting is prohibited. May transport carcass)*

821.280 Commit unlawful damage with snowmobile, Class I, II ATV; Expose underlying soil or vegetation or injure, damage, destroy trees or crops.

821.285 Commit unlawful damage with Class III ATV;*(motorcycle)* (1) Operates in such a manner as to injure, damage, destroy trees or growing crops.

821.290 Dangerous operation of snowmobile or ATV;
(a) Rate of speed greater than reasonable and proper under the existing conditions.
(b) Negligent manner that endanger person or property of another or cause injury or damage to either.

OREGON OFF-ROAD VEHICLES
SNOWMIBILES; ALL-TERRAIN VEHICLES

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DRIVING PRIVILEGES

Snowmobile operator permit issued by DMV. ATV operator permit issued by OR State Parks at 800-551-6949, www.prd.state.or.us/atv_permit.html

SNOWMOBILE

821.150 Operation of snowmobile without driving privileges; (a) A driver's license, or (b) A snowmobile operator permit

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CLASS I ATV *(3 or 4 wheeler, under 50"wide, less than 800 lbs)*

821.170 Operation of Class I all-terrain vehicle without driving privileges; (a) A valid drivers license, **or** (b) A valid Class I ATV operator permit, **or** (c) With 18 year old with driver license or ATV permit and on same or like ATV.

(2) No under 12 year old on snowmobile trail without a Class I ATV permit.

CLASS II ATV (*jeep, pickup, etc; 50+" wide, over 800 lbs – less 8,000 lbs)*

A Class II ATV operated off National Forest System roads or on a designated ATV/OHV trail or area, must meet the driver's license requirements of a General Motor Vehicle. See page D-1 for applicable 36 CFR.

CLASS III ATV *(Motorcycle)*

821.172 Operation of Class III all-terrain vehicle without driving privileges;

(1) 12+ year old meet one of the following;

(a) Driver license; **or** (b) Class III ATV operator, **or** (c) With 18 year old with driver license or ATV permit & on same or like ATV.

(2) 7 year old but under 12 must;

(a) Class III ATV permit; **and** (b) With 18 year with driver license or ATV permit and on the same or like ATV.

(3) Person under 7 years of age may not operate a Class III ATV on public lands.

CLASS I or III ATV *(3 or 4 wheeler under 50" & 800 lbs or motorcycle)*

821.174 Operating Class I or III ATV while driving privileges suspended.

Operator is in violation of ORS 811.175 (A Traffic violation) or ORS 811.182 (C Felony / A Misdemeanor)

821.292 Endangering Class III ATV operator; *(motorcycle)*

(1) Parent, guardian or person with responsibility of a child at least 7 but under 12 **and** child (a) Does not have a Class III ATV operator permit; **and** (b) Is not with parent, guardian, person with responsibility who is on the same ATV or like ATV.

(2) Parent, guardian, person with responsibility of child under 7 and the child operates a Class III ATV on public lands.

REGISTRATION & PERMITS

SNOWMOBILES *Registration and permits are issued by DMV*

821.070 Failure to title snowmobile;
821.100 Operation of unregistered snowmobile;
821.110 Failure to renew snowmobile registration
821.120 Failure to properly display snowmobile registration numbers
821.140 Failure to carry out-of-state snowmobile permit

ALL-TERRAIN VEHICLES *(Class I, II and III)* *Registration/permits issued by OR State Parks, 800/551-6949 www.prd.state.or.us*

821.142 Failure to carry out-of-state ATV permit
821.195 Operation of ATV without permit and decal

OREGON OFF-ROAD VEHICLES
SNOWMIBILES; ALL-TERRAIN VEHICLES

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HELMET LAWS

Note that snowmobiles & Class II are not included

821.202 Failure of Class I or III ATV rider to wear motorcycle helmet;
(1) Under 18 years of age, operator or passenger on a Class I or Class III ATV.

821.203 Endangering Class I or III ATV operator or passenger;
(a) Operating Class I or III ATV and carries another person who is under 18 years of age and is not wearing a motorcycle helmet; **or**
(b) Parent, guardian or person with responsibility of a child under 18 years and the child operates or rides on an ATV without wearing a motorcycle helmet.

821.204 Issuance of citation for violation of ORS 821.202 or 821.203.
(1) Child 11 or younger, citation shall be issued to parent, guardian or person with responsibility rather than to the child for violation of ORS 821.202.
(2) Child 12, and under 18, citation may be issued to child or the parent, guardian or person with responsibility for violation of ORS 821.203, but not to both.

EQUIPMENT

OFF-ROAD VEHICLE (Class I, II and III and Snowmobiles)

821.040 Operation of off-road vehicle without required equipment;
(a) Muffler that meets the standards for noise established under ORS 821.030.
(b) Equipped with brakes that meet the requirements under ORS 821.030.
(c) Equipped with a windshield wiper if the vehicle is equipped with a windshield.
(d) On sand, equipped with a flag that meets ORS 821.030.
(e) Any safety equipment required under ORS 821.030.
(f) ½ hour after sunset to ½ hour after sunrise, w/ headlights & taillights.

SNOWMOBILE

821.210 Operating improperly equipped snowmobile;
(a) A lighted headlight and taillight.
(b) An adequate braking device that may be operated either by hand or foot.
(c) Adequate operating muffler that blends exhaust and motor noise to preclude excessive or unusual noise and, on snowmobiles manufactured after 1/4/73, maintain such noise at a level of 82 decibels or below on the "A" scale at 100 feet.

ALL-TERRAIN VEHICLES (Class I, II and III)

821.220 Operating improperly equipped all-terrain vehicle;
(a) Adequate braking device that may be operated either hand or foot.
(b) Adequate and operating muffling device maintained in good working order and comply with standards established by the DEQ.

821.230 Operating all-terrain vehicle without proper lighting equipment
Operates ATV during time when limited visibility conditions exist and the ATV is not equipped with a taillight and a headlight. C Traffic

CIVIL LIABILTY

821.310 Treble damages for damage to property. Liable for three times the amount of damage to trees, shrubs, growing crops or other property injured by snowmobile or ATV *Use for civil action / restitution*

Appendix D

APPENDIX D: Compliance with Mt. Hood National Forest Land and Resource Management Plan (1990) and Northwest Forest Plan (1994)

<table>
<tr><th>Standards and Guidelines</th><th>Is a plan amendment needed?</th></tr>
<tr><td colspan="2">Mt. Hood Forest Plan Standards and Guidelines</td></tr>
<tr><td>FW-025 (Soil Productivity)
In the first year following surface disturbing activities, the percent effective groundcover by soil erosion hazard class should achieve at least the following levels:
<table>
<tr><th>Soil Hazard Class</th><th>Effective Ground Cover</th></tr>
<tr><td>Low to Moderate</td><td>60%</td></tr>
<tr><td>Severe</td><td>75%</td></tr>
<tr><td>Very Severe</td><td>85%</td></tr>
</table></td><td></td></tr>
<tr><td>FW-032 (Soil Productivity)
Favorable habitat conditions for soil organisms should be maintained for short and long term soil productivity.</td><td></td></tr>
<tr><td>FW-040 (Air Quality)
Management activities shall comply with all applicable air quality laws and regulations, including the Clean Air Act (1977 and any updates or revisions) and its associated Oregon State Implementation Plan.</td><td></td></tr>
<tr><td>FW-041 (Air Quality)
Management activities shall comply with Oregon State Smoke Management Plan</td><td></td></tr>
<tr><td>FW-046 (Air Quality)
Forest resources in non-Class I airshed shall be protected from the effects of air pollution based on the guidelines for Class II airsheds (Clean Air Act 1977)</td><td></td></tr>
<tr><td>FW-047 (Air Quality)
Air Quality related values within Class I airsheds, e.g. portions of the Mt. Hood Wilderness and all of the Mt. Jefferson Wilderness on the Mt. Hood National Forest, shall be protected from the effects of air pollution.</td><td></td></tr>
<tr><td>FW-052, FW-053 (Air Quality)
Impacts of prescribed burning on smoke sensitive areas (e.g. Federal Class I airsheds and other areas designated in the Oregon Smoke Management Plan) shall be minimized. Total particulate emissions shall be reduced consistent with goals set by the Oregon Department of Environmental Quality.</td><td></td></tr>
<tr><td>FW-054 (Water)
Water quality associated with management activities shall be in compliance with Oregon State requirements (Oregon Administrative Rules, Chapter 340-41) established in accordance with the Federal Clean Water Act (1977, as amended 1987).</td><td></td></tr>
<tr><td>FW-055, FW-056 (Water)
Compliance with State requirements shall be met through planning, application, and monitoring of Best Management Practices FEIS, (Appendix H). Best Management Practices (BMPs) describe the process which shall be used to implement the State Water Quality management Plan on lands administered by the USDA Forest Service.</td><td></td></tr>
<tr><td>FW-057, FW-058 (Water)
Individual, general Best Management Practices which may be implemented (i.e. on a project by project basis) are described in General Water Quality Best Management Practices, Pacific Northwest Region, 11/88. Evaluations of ability to implement and estimated effectiveness shall be made at the project level.</td><td></td></tr>
<tr><td>FW-060 (Water)
Management practices causing detrimental changes water temperature or chemical composition, blockages of water courses, or deposits of sediment shall not be permitted (36 CFR 219.27 e).</td><td></td></tr>
</table>

Standards and Guidelines	Is a plan amendment needed?
Mt. Hood Forest Plan Standards and Guidelines	
FW-062 (Water) Not more than 35 % of an area available for vegetative manipulation should be in a hydrologically disturbed condition at any one time.	
FW-066 (Water) Cumulative effects analyses of management activities on water quality and/or stream channel stability (e.g. watershed impact analyses) shall include lands on all ownerships within the watershed.	
FW-075 (Water) The disposal or accidental discharge of petroleum products and hazardous materials on National Forest System lands shall be prevented.	
FW-082 (Riparian Area) At least 95 percent ground cover (e.g. vegetation, duff, or litter) shall be maintained within all project activity areas (within riparian areas).	
FW-083 (Riparian Area) Ground disturbing activities should not occur in saturated soil areas.	
FW-084 (Riparian Area) Activities within and adjacent to riparian areas should not accelerate sediment delivery to streams, lakes, wetlands, seeps, and springs.	
FW-105 (Riparian Area) Fish bearing perennial streams – At least 95 % effective ground cover (e.g. adapted trees, shrubs, sedges, and grasses) in a project activity area should be maintained.	
FW-113 (Riparian Area) State water quality standards for turbidity shall be met.	
FW-123 (Riparian Area) Non-Fish bearing perennial streams (Class 3) – At least 90 % effective ground cover (e.g. adapted trees, shrubs, sedges, grasses, and duff) in a project activity area should be maintained.	
FW-129 (Riparian Area) Sediment loading shall be minimized and stream channel conditions maintained to meet State water quality standards for turbidity.	
FW-138 (Fisheries) Impacts on habitat for the management indicator species group (salmonids) shall be determined for each project affecting fisheries, in terms of habitat quality, quantity, and distribution.	
FW-156 (Forest Diversity) Vegetation management activities shall not result in a permanent loss of any species native to a particular ecosystem.	
FW-161 (Forest Diversity) Management activities shall contribute to recovery and conservation of Federally listed threatened or endangered species (Endangered Species Act, 1973; 36 CEF 219.19)	
FW-162 (Forest Diversity) Habitat Management should provide for maintenance of viable populations of native and desirable non-native wildlife, fish (36 CFR 219.19), and plant species (USDA Regulations 9500-4) well distributed throughout their current geographic range within the National Forest System.	
FW-174 (Threatened, Endangered and Sensitive Plants and Animals) Threatened, endangered and sensitive plants and animals shall be identified and managed in accordance with the Endangered Species Act (ESA) (1973), Oregon ESA (1987), and FSM 2670.	
FW-175 (Threatened, Endangered and Sensitive Plants and Animals) Habitat for threatened, endangered and sensitive plants and animals shall be protected and/or improved.	

Standards and Guidelines	Is a plan amendment needed?
Mt. Hood Forest Plan Standards and Guidelines	
FW-176 (Threatened, Endangered and Sensitive Plants and Animals) Biological Evaluations (FSM 2672.4) shall be prepared for all Forest Service planned, funded, executed, or permitted programs and activities for possible effects on endangered, threatened or sensitive species.	
FW-177, FW-178 (Threatened, Endangered and Sensitive Plants and Animals) Consultation with USFWS shall occur on each program activity or project that the Forest Service determines may affect threatened or endangered species. Consult. Consultation shall be completed before any decision is made on the proposed project.	
FW-179 (Threatened, Endangered and Sensitive Plants and Animals) Species Management Guides shall be prepared, in accordance with Northwest Region species recovery plans, to address effects of management activities and identify opportunities to maintain or enhance habitat for plants and animal species which may frequently conflict with standard management practices.	
FW-180 (Threatened, Endangered and Sensitive Plants and Animals) Lists of threatened, endangered and sensitive plant and animal species shall be maintained and updated periodically as new information is collected.	
FW-182, FW-183, FW-184 (Threatened, Endangered and Sensitive Plants and Animals) If habitat allocated for threatened, endangered or sensitive species protection or recovery (i.e. A8 Spotted Owl Habitat Areas and A13 Bald Eagle Recovery Areas) is lost (e.g. due to windthrow or wildfire), replacement habitat of equal or better quality (or the best available) shall be designated and allocated. For A8 Management Areas, replacement habitat shall be allocated if 30 acres or more habitat is lost. Replacement habitat should be located immediately adjacent to the remaining A8 habitat.	
FW-187 (Wildlife) Key habitat areas (e.g. reading areas, mineral licks, and wallows) should be protected.	
FW-189 (Wildlife) Existing natural meadows/openings shall be maintained.	
FW-208 (Wildlife) Within the roaded portions of the Forest, by year 2000, roads open to motorized vehicle traffic should be reduced to not exceed 2.0 miles per square mile within inventoried deer and elk winter range and 2.5 miles per square mile within inventoried deer and elk summer range (i.e. outside of inventoried winter range).	
FW-211, FW-212 (Wildlife) Roads may be closed when necessary to limit activities which inhibit deer and elk use of quality foraging, rearing and wintering areas. Roads should be close to: (c) Provide limited-road-access recreational hunting opportunities, in coordination with ODFW [Oregon Department of Fish & Wildlife].	
FW-213 (Wildlife) Activities within key deer and elk rearing areas may be restricted between May 15 and July 1.	
FW-243 (Wildlife) Plant community integrity of special habitat conditions, e.g. caves, cliffs, talus slopes, meadows, oak, and dry shrub, should be protected.	
FW-254 (Forest Protection and Public Safety) Fire prevention activities shall be emphasized based on the following fire prevention priority levels a. Level III (areas of active industrial operators) b. Level II (areas of concentrated public use) c. Level I (other National Forest System land)	
FW-255 (Forest Protection and Public Safety) Emphasis should be placed on providing fire prevention information and education within the Mt. Hood fire prevention zone of influence.	

Standards and Guidelines	Is a plan amendment needed?
Mt. Hood Forest Plan Standards and Guidelines	
FW-256 (Forest Protection and Public Safety) All wildfires shall receive an "appropriate suppression response" (Regional Guide for Pacific Northwest Region, 1984).	
FW-279 (Hazardous Materials) Project spill contingency plans shall be developed for all project activities where oil or potentially hazardous substances are used by the Forest Service, its permittees, or other users (i.e. contractors) of National Forest lands (40 CFR Part 112).	
FW-300 (Range Management) Plants identified as pests by Oregon Department of Agriculture (ODA) shall be controlled as described in the Mt. Hood National Forest Noxious Weed Implementation Plan.	
FW-301 (Range Management) Implementation of control measures should adhere to priorities: 1) prevention; 2) early treatment; 3) maintenance; 4) correction; and, 5) no action.	
FW-304 (Range Management) Roads closed for recreational vehicle use may be used for livestock management purposes, i.e. administrative use.	
FW-407, FW-408 (Transportation) Opportunities for recreational access may be limited and shall be consistent with management direction.	
FW-409 (Transportation) Areas and trails may be designated as available for motorized and/or non-motorized access.	
FW-411 (Transportation) Seasonal closures or travel restrictions may be applied to protect or enhance resource values (i.e. both recreation and non-recreation associated resource values).	
FW-412 (Transportation) Provisions of Oregon State Laws related to the operation of motor vehicles shall be applicable to all open Forest Service roads, i.e. Forest Service road maintenance levels 2 through 5. Applicable Oregon State Laws are enforceable by State and County law officers.	
FW-413 (Transportation) Roads, areas and trails closed or restricted to recreational access shall be posted.	Yes
FW-434 (Transportation) Potential conflicts between commercial traffic and recreational traffic shall be coordinated to insure public safety. Examples include: (1) designing routes for log haul separate from winter recreation trails, (2) limiting commercial log and rock haul during high recreational use periods, and (3) dust abatement.	
FW-447 (Transportation) Off-road vehicle trials should not incorporate open roads as part of the trail system.	Yes
FW-459 (Dispersed Recreation Activities) Off-road vehicle (ORV) trails should not incorporate open roads as part of the trail system.	Yes
FW-465 (Dispersed Recreation Activities) Opportunities for ORV use should be available except where not allowed by management direction, and where determined to adversely impact land capability and resource values (see Appendix C, Trail and Access management Guide, and see Forest Transportation System/Facilitates; Travel and Access Standards and Guidelines)	Yes
FW-483 (Eligible Wild, Scenic, and Recreational Rivers) Areas, roads and segments of rivers closed to vehicle use shall be posted.	Yes
FW-484 (Eligible Wild, Scenic, and Recreational Rivers) Administrative use of motorized vehicles shall be allowed within the river corridors of all river segment classifications.	

Standards and Guidelines	Is a plan amendment needed?
Mt. Hood Forest Plan Standards and Guidelines	
FW-497 (Visual Resource Management) Within scenic segments, VQOs of Retention in the foreground and Partial Retention in the middleground shall be prescribed – as seen from the river, river banks, U.S. and State highways, Forest highways and roads, trails, and recreation facilities within the corridor.	
FW-498 (Visual Resource Management) Within recreational segments, VQOs of Retention in the foreground and Partial Retention in the middleground shall be prescribed – as seen from the river, river banks, U.S. and State highways, Forest highways and roads, trails, and recreation facilities within the corridor.	
FW-543(Visual Resource Management) Areas, roads and segments of rivers closed to vehicle use shall be posted.	Yes
FW-554 (Visual Resource Management) Visual quality objectives for "designated viewsheds" shall be prescribed as listed in Table Four-23 Designated Viewsheds.	
FW-609, FW-610 (Cultural Resources Management) All proposed projects which could affect a cultural resource shall be assessed for their effect on National Register, eligible, or unevaluated properties. Assessments shall use the criteria of "effect and adverse effect" (36 CFR 800.9. Projects include all Federally funded undertakings, and undertakings requiring Federal permit (36 CFR 800.9 (a)(b)).	
FW-627 (Human Rights) The Forest shall be managed and administered in such a manner as to provide all persons equal opportunity, regardless of race, color, creed, sex, marital status, age, handicap, religion, or national origin.	
FW-628 (Human Rights) The Forest shall be managed to break down social and institutional barriers to legitimate uses of the Forest by nontraditional groups.	
FW-629 (Human Rights) Consultation with diverse cultural groups shall occur on a regular basis.	
FW-630, FW-631 (Human Rights) The treaty rights and privileges of Native Americans shall be honored. Treaty rights and privileges should supercede other management direction.	
FW-632 (Human Rights) The American Indian Religious Freedom Act (1978) shall be considered in administration of the Forest.	
FW-639, FW-640 (Human Rights) Special efforts shall be made to inform the public, including minorities and underprivileged individuals and groups, of benefits they are eligible to receive from Forest programs. Techniques suited to increase awareness and participation shall be used.	
A2-043 (Wilderness) The use of motorized or mechanized equipment, except small battery-powered-hand-held devices, such as cameras, shavers, or flashlights, shall be prohibited unless authorized by the Forest Service.	
A2-104 (Wilderness) Off-road vehicle use shall be prohibited.	
A3-006, A3-007 (Research Natural Areas) Off-road vehicles (ORV) and non-motorized bicycle use shall be prohibited. RNAs shall be posted as closed to ORV and non-motorized bicycle use.	Yes
A3-040 (Research Natural Areas) All forms of off-road vehicle use shall be prohibited.	
A4-038 (Special Interest Area) Recreational off-road vehicle use shall be prohibited except as noted in items 4 [a4-039] and 5 [A4-040] below.	Yes

Standards and Guidelines	Is a plan amendment needed?
Mt. Hood Forest Plan Standards and Guidelines	
A4-039 (Special Interest Area) Off-road vehicle uses in powerline rights-of-way should be allowed where consistent with other management direction, e.g. riparian and cultural resources protection.	Yes
A5-037 (Unroaded Recreation) Motorized vehicle use shall be prohibited, except in emergency situations (e.g. fire suppression and search and rescue) and timber salvage activities.	
A6-034 (Semi-Primitive Roaded Recreation) Recreational off-road vehicle use shall be permitted only on designated trails.	
A6-035 (Semi-Primitive Roaded Recreation) The area north of Wahtum Lake shall be closed to recreational off-road vehicle use.	
A7-024 (Special Old Growth) Recreation off-road vehicle use should be prohibited.	Yes
A7-026 (Special Old Growth) All modes of cross-county travel should be discouraged.	
A8-004, A8-005 (Northern Spotted Owl Habitat Area) Recreational off-road vehicle use shall be permitted only on designated trails. Recreational off-road vehicle use shall be prohibited between March 1 and September 30.	
A8-038, A8-039 (Northern Spotted Owl Habitat Area) Off-road vehicle use shall be permitted only on designated trails. Off-road vehicle activities shall be prohibited between March 1 and September 30.	
A8-041 (Northern Spotted Owl Habitat Area) All modes of off-trail trail should be discouraged.	
A9-038 (Key Site Riparian) Recreation off-road vehicle use, except over-snow vehicles, shall be prohibited.	Yes
A10-005 (Developed Recreation) All motorized recreational vehicles, except over snow vehicles, shall be limited to access roads and parking areas.	
A10-023 (Developed Recreation) Motorized vehicles, except over snow vehicles, shall be limited to access roads and parking areas.	
A11-037 (Winter Recreation Areas) Off-road vehicles use shall be prohibited. [within the immediate hydrologic influence zone upslope from Stringer Meadows (A4 Special Interest Areas, i.e. within Mt. Hood Meadows A11 Winter Recreation Management Area)].	
A11-040 (Winter Recreation Areas) Summer off-road vehicle and mountain bicycle use shall occur only on designated trails and roads.	
A11-043 (Winter Recreation Areas) Motorized access shall be allowed only within parking lots..	
A12-026 (Outdoor Education Area) Off-road vehicle use shall be prohibited.	
A13-030, A13-031 (Bald Eagle Habitat Area) Recreational off-road vehicle use shall be restricted to designated trails and shall be prohibited in active nesting areas between January 1 and August 15.	
A13-032 (Bald Eagle Habitat Area) All modes of off-trail travel shall be discouraged.	
A13-032 (Bald Eagle Habitat Area) All modes of off-trail travel shall be discouraged.	
B1-050 (Wild, Scenic and Recreational Rivers) All river segments shall be managed to remain in a free flowing and unpolluted state.	

Standards and Guidelines	Is a plan amendment needed?
Mt. Hood Forest Plan Standards and Guidelines	
B1-077, B1-078, B1-079 (Wild, Scenic and Recreational Rivers) Within scenic and recreational river corridors, motorized use shall be limited. 1) Motorized vehicles shall be permitted only on open roads. 2) Off-road vehicles (ORV) may occur only on designated trails.	Yes
B1-082, B1-083 (Wild, Scenic and Recreational Rivers) Areas, roads and segments of rivers closed to vehicle use shall be posted. Administrative use of motorized vehicles shall be allowed in all river segments.	Yes
B2-060, B2-061 (Scenic Viewsheds) Recreational off-road vehicles (ORV) may be permitted only on designated routes. Areas may be closed or restricted to ORV use to meet prescribed VQOs or achieve other resource objectives.	
B3-038 (Roaded Recreation) Off-road vehicle use shall be encouraged on designated trails and/or areas.	Yes
B3-039 (Roaded Recreation) Off-road vehicle use shall be prohibited within the B3 Management Areas at Indian mountain (Hood River Ranger District) and along Sherar Burn Road 2613 (Zig Zag Ranger District).	
B4-048, B4-049 (Pine-Oak Habitat) Motorized vehicle use shall occur only on designated travel routes. Cross county motorized travel shall be prohibited.	
B5-001, B5-002 (Pileated Woodpecker/Pine Martin Habitat Area) Off-road motorized vehicle use should not be permitted except on designated trails. All areas and trails closed to off-road vehicle use shall be posted.	Yes
B6-036, B6-037 (Special Emphasis Watersheds) Recreational off-road vehicle use (other than over-snow) shall be discouraged. Recreational off-road vehicle use shall be prohibited in Still Creek and The Dalles Watershed Management Unit.	Yes
B7-010 (General Riparian Area) Off-road vehicle stream crossing shall be specifically identified and should be equipped with bridges, culverts, or other effective measures to guard against bank/shoreline damage and water quality degradation.	
B7-060 (General Riparian Area) Recreational off-road vehicle use shall be discouraged.	
B7-061 (General Riparian Area) New trails should be located outside of wetlands and other special riparian, aquatic, and threatened/endangered species habitat.	
B7-062 (General Riparian Area) Trails should cross riparian areas in the shortest distance possible, i.e. at right angles to the drainage.	
B8-022, B8-023 (Earthflow) Motorized vehicle use shall occur only on designated routes. Recreational cross country motorized travel shall be prohibited.	
B8-051 (Earthflow) Off-road vehicle recreational use shall be permitted only on designated trails..	
B9-002 (Wildlife / Visual Area) Recreational off-road vehicle activities should not be permitted.	
B9-032, B9-033, B9-034 (Wildlife / Visual Area) Roads open to recreational vehicle use may occur. Open road density should not exceed 1.5 miles per square mile. Roads that are necessary shall be developed at a minimum standard, i.e. minimizing effects on deer and elk habitat.	
B9-035 (Wildlife / Visual Area) Existing off-road vehicle tracks, and other wheel tracks, should be closed and rehabilitated, e.g. blocked, stabilized and returned to a natural condition.	

Standards and Guidelines	Is a plan amendment needed?
Mt. Hood Forest Plan Standards and Guidelines	
B9-037 (Wildlife / Visual Area) Recreational motorized vehicle activity shall not be permitted except on open roads and designated parking areas.	
B10-038 (Deer and Elk Winter Range) Recreational vehicle access corridors should be provided during the winter to higher elevation snow zones to facilitate winter recreational opportunities.	
B10-039 (Deer and Elk Winter Range) Recreational access should be restricted between December 1 and April 1.	
B10-040, B10-041 (Deer and Elk Winter Range) Recreational motorized vehicle use shall occur only on designated travel routes. Cross country recreational motorized travel shall be prohibited.	
B11-002 (Deer and Elk Summer Range) Recreational off-road vehicle use should not be permitted.	
B11-005 (Deer and Elk Summer Range) Off-trail travel should be discouraged.	
B11-033 (Deer and Elk Summer Range) Roads open to recreational vehicles use may occur.	
B11-036 (Deer and Elk Summer Range) Existing off-road vehicle tracks, and other wheel tracks, should be closed and rehabilitated, e.g. blocked, stabilized and returned to a natural condition.	Yes
B11-037 (Deer and Elk Summer Range) Recreational motorized vehicle activity shall not be permitted except on open roads and designated parking areas.	Yes
B12-039, B12-040 (Backcountry Lakes) Motorized access should be discouraged in near-foreground areas (i.e. 100 feet). The following lakes may be exceptions: a. North end of Summit Lake b. Scout Lake c. North side of Kinzel Lake	
B12-039, B12-041 (Backcountry Lakes) Vehicle access should not be provided within ½ mile of the following lakes: Buck, Dinger, and Veda.	
C11-001 (Timber Emphasis) Off-road vehicle (ORV) use should be encourages. ORV use should be restricted within specific areas with conflicting resource objectives.	Yes
C11-041, C11-042 (Timber Emphasis) Off-road vehicle (ORV) use should be encourages. ORV use should be restricted within specific areas with conflicting resource objectives.	Yes
Amendment #7 (White River Wild & Scenic River) Prohibit off-road driving unless and until Watershed Analysis, Access and travel Management planning, and the LAC study indicate that a designated route and crossing over White River is feasible and acceptable.	
Amendment #7 (White River Wild & Scenic River) Prohibit off-road driving in Two Rivers.	

Standards and Guidelines	Is a plan amendment needed?
Northwest Forest Plan Standards and Guidelines	
C-4 & C-5 Survey and Manage Standards &Guidelines: (1) manage known sites, (2) survey prior to ground-disturbing activities.	
C-6 Manage recreation areas to minimize disturbance to Survey & Manage species.	
NWFP ROD Late-Successional Reserves Recreational Use – Dispersed recreational uses, including hunting and fishing, generally are consistent with the objectives of Late Successional Reserves. Use adjustment measures, such as education, use limitations, traffic control devices, or increased maintenance when dispersed and development recreation practices retard or prevent attainment of Late Successional Reserve objectives.	
NWFP ROD Riparian Reserves Recreation Management RM-1: New recreation facilities within Riparian Reserves, including trails and dispersed sites should be designed to not prevent meeting the Aquatic Conservation Strategy objectives. Construction of these facilities should not prevent future attainment of the objectives. For existing recreation facilities within Riparian Reserves, evaluate and mitigate impact to insure that these do not prevent, and to the extent practicable contribute to, attainment of the Aquatic Conservation Strategy objectives. RM-2: Adjust dispersed and developed recreation practices that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where adjustment measures, such as education, use limitation, traffic control devices, increased maintenance, relocation of facility and/or site closure are not effective, eliminate the practice or occupancy.	
Surveyor's Ridge LSR Assessment Implement the road and trail management recommendations from the Eastside Travel and Access management planning effort. This effort established road and trail management guidelines and networks designed to meet current and anticipated needs to administrative and recreational access. The network is also deigned to reduce sediment input to streams.	
Surveyor's Ridge LSR Assessment Proposal to designate a fifty mile motorized trail system, of which 22.9 miles lie within the LSR, for OHV (motorcycle, three and four-wheelers) use.	
North Willamette LSR Assessment A limited number of off-highway vehicle (OHV) trails are located in the Roaring River Watershed in RO207A. The Roaring River Watershed Analysis recommends the LSR Assessment develop "a multiwatershed OHV management plan that includes Roaring River Watershed". The development or expansion of new OHV trails in LSRs is not recommended by this assessment team. OHV trails and roads are not considered neutral or beneficial to LSR objectives because they function like roads in terms of habitat fragmentation, potential sediment delivery, loss of soil productivity, and wildlife harassment.	
Douglas Cabin LSR Assessment Off-road motorized travel for non-emergency purposes [is an] incompatible use requiring further analysis of possible overriding social value.	
Douglas Cabin LSR Assessment Off-road motorized travel for non-emergency purposes [is an] incompatible use requiring further analysis of possible overriding social value.	

Appendix E
Alternative 2 Road Data

APPENDIX E: Alternative 2 Road Data

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
1700-013	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Gibson	I	0.1
1700-661	Decision Road	1	Native Surface	Convert to Trail	Gibson	I	1.2
1711-623	Open Road	1	Improved Native Surface	Convert to Trail	Gibson	I	0.0
1711-623	Decision Road	1	Improved Native Surface	Convert to Trail	Gibson	I	0.4
1700-660	Open Road (Not Main-tained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	Gibson	MU-I	0.1
1711-620	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Gibson	MU-I	0.4
1711-620	Open Road	2	Native Surface	Mixed-Use Route	Gibson	MU-I	0.5
1711-621	Open Road	2	Improved Native Surface	Mixed-Use Route	Gibson	MU-I	1.7
1711-630	Open Road	2	Improved Native Surface	Mixed-Use Route	Gibson	MU-I	2.4
4610-011	Decision Road	1	Improved Native Surface	Close to All Traffic	LaDee Flat	CL	0.6
4610-012	Decision Road	1	Native Surface	Close to All Traffic	LaDee Flat	CL	0.1
4610-017	Decision Road	1	Native Surface	Close to All Traffic	LaDee Flat	CL	0.3
4610-019	Decision Road	1	Native Surface	Close to All Traffic	LaDee Flat	CL	0.3
4611-012	Decision Road	1	Native Surface	Close to All Traffic	LaDee Flat	CL	0.4
4611-014	Decision Road	1	Native Surface	Close to All Traffic	LaDee Flat	CL	0.2
4611-120	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	LaDee Flat	CL	0.2
4611-132	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	LaDee Flat	CL	1.0
4611-135	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	LaDee Flat	CL	0.6
4610-011	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	0.1
4610-011	Decision Road	1	Improved Native Surface	Convert to Trail	LaDee Flat	I, II, III	0.0
4610-013	Decision Road	1	Native Surface	Convert to Trail	LaDee Flat	I, II, III	0.2
4610-014	Decision Road	1	Native Surface	Convert to Trail	LaDee Flat	I, II, III	0.7
4610-015	Decision Road	1	Native Surface	Convert to Trail	LaDee Flat	I, II, III	0.3
4610-016	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	1.2

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4610-112	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	0.9
4610-113	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	0.5
4610-113	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	1.5
4611-120	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	0.2
4611-120	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	0.7
4611-121	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	1.6
4611-125	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	0.2
4611-130	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	1.8
4610-000	Secondary Low Clear-ance Road	3	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I,II,III	0.6
4610-000	Secondary Low Clear-ance Road	3	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I,II,III	4.1
4610-000	Secondary High Clear-ance Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I,II,III	10.4
4610-000	Secondary High Clear-ance Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I,II,III	0.6
4610-000	Secondary High Clear-ance Road	3	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I,II,III	0.5
4610-000	Secondary High Clear-ance Road	3	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I,II,III	0.1
4610-024	Open Road (Not Main-tained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I,II,III	0.2
4610-115	Decision Road	1	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I,II,III	1.2
4611-000	Open Road (Not Main-tained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I,II,III	1.5
4610-000	Open Road (Not Main-tained)	2	Native Surface	Mixed-Use Route	LaDee Flat	MU-II	7.8

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4610-000	Open Road (Not Main-tained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-II	0.5
2120-011	Decision Road	1	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.4
2120-017	Decision Road	1	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.3
2120-370	Open Road	1	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.2
2130-016	Decision Road	1	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.0
2110-240	Open Road	1	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	I, III	1.3
2110-260	Open Road (Not Main-tained)	1	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.7
2110-260	Open Road (Not Main-tained)	1	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.8
2110-261	Open Road	1	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.2
2120-011	Decision Road	1	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.5
2120-370	Open Road	1	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	I, III	0.4
2120-371	Open Road	1	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.3
2130-016	Decision Road	1	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.4
2110-000	Open Road (Not Main-tained)	2	Paved	Mixed-Use Route	McCubbins Gulch	MU-I,III	0.4
2110-000	Open Road (Not Main-tained)	3	Paved	Mixed-Use Route	McCubbins Gulch	MU-I,III	0.1
2110-000	Open Road (Not Main-tained)	3	Paved	Mixed-Use Route	McCubbins Gulch	MU-I,III	0.8
2110-017	Decision Road	1	Native Surface	Mixed-Use Route	McCubbins Gulch	MU-I,III	0.3
2110-018	Decision Road	1	Crushed Aggregate or Gravel	Mixed-Use Route	McCubbins Gulch	MU-I,III	0.3
2110-021	Decision Road	1	Native Surface	Mixed-Use Route	McCubbins Gulch	MU-I,III	0.4
2110-250	Open Road (Not Main-tained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	McCubbins Gulch	MU-I,III	2.4
2110-251	Decision Road	1	Native Surface	Mixed-Use Route	McCubbins Gulch	MU-I,III	0.4
2120-000	Open Road (Not Main-tained)	2	Native Surface	Mixed-Use Route	McCubbins Gulch	MU-I,III	0.2

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
2120-000	Open Road (Not Maintained)	2	Paved	Mixed-Use Route	McCubbins Gulch	MU-I,III	1.4
2120-000	Open Road (Not Maintained)	2	Paved	Mixed-Use Route	McCubbins Gulch	MU-I,III	0.3
2120-013	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	McCubbins Gulch	MU-I,III	0.5
2120-320	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	McCubbins Gulch	MU-I,III	1.5
4200-330	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.1
4200-331	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.1
4200-332	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.1
4200-332	Decision Road	1	Native Surface	Close to All Traffic	Peavine	CL	0.1
4200-340	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.1
4200-341	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.2
4200-520	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.1
4210-042	Decision Road	1	Native Surface	Close to All Traffic	Peavine	CL	0.1
4210-043	Decision Road	1	Native Surface	Close to All Traffic	Peavine	CL	0.3
4661-018	Decision Road	1	Improved Native Surface	Close to All Traffic	Peavine	CL	0.2
4661-143	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.3
4661-150	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	1.0
4661-160	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.9
4661-162	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.6
4661-164	Decision Road	1	Native Surface	Close to All Traffic	Peavine	CL	1.3
4661-166	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.2

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4661-190	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.6
4661-193	Decision Road	1	Improved Native Surface	Close to All Traffic	Peavine	CL	0.4
4661-200	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	1.3
4200-320	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, II, III	1.4
4200-330	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, II, III	1.0
4200-340	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, II, III	0.8
4200-340	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, II, III	1.3
4200-520	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, II, III	2.4
4210-041	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, II, III	0.5
4210-044	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, II, III	0.7
4210-350	Open Road (Not Main-tained)	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, II, III	1.5
4230-120	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, II, III	0.5
4240-014	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, II, III	0.1
4240-120	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, II, III	0.7
4240-120	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, II, III	1.5
4661-026	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, II, III	1.1
4661-029	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, II, III	0.2
4661-140	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, II, III	1.3
4661-140	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, II, III	1.0
4661-141	Open Road	1	Native Surface	Convert to Trail	Peavine	I, II, III	0.8
4661-180	Open Road	2	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, II, III	1.5
4661-205	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, II, III	1.1
4200-032	Decision Road	1	Native Surface	Mixed-Use Route	Peavine	MU-I,II,III	1.7
4230-000	Open Road (Not Main-tained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I,II,III	1.6

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4230-000	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I,II,III	1.8
4230-370	Open Road (Not Maintained)	1	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I,II,III	1.0
4230-370	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I,II,III	1.3
4240-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I,II,III	0.3
4240-110	Open Road	2	Native Surface	Mixed-Use Route	Peavine	MU-I,II,III	3.0
4240-110	Open Road	2	Native Surface	Mixed-Use Route	Peavine	MU-I,II,III	1.6
4661-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I,II,III	2.9
4811-170	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.4
4812-140	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.1
4812-140	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.6
4812-160	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.5
4813-140	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.4
4813-160	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.8
4814-120	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.8
4814-130	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.6
4814-130	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.4
4820-140	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	2.8
4820-150	Open Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	3.3
4820-150	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.4
4820-152	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	1.1
4820-153	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.1
4820-153	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.4
4860-017	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.6

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4860-130	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.4
4860-130	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	1.1
4800-130	Decision Road	1	Native Surface	Mixed-Use Route	Rock Creek	MU-I,III	1.3
4800-130	Open Road	2	Improved Native Surface	Mixed-Use Route	Rock Creek	MU-I,III	0.1
4800-240	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I,III	0.0
4800-240	Decision Road	1	Native Surface	Mixed-Use Route	Rock Creek	MU-I,III	1.1
4800-240	Open Road	1	Native Surface	Mixed-Use Route	Rock Creek	MU-I,III	0.1
4800-241	Decision Road	1	Improved Native Surface	Mixed-Use Route	Rock Creek	MU-I,III	0.5
4811-000	Secondary High Clear-ance Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I,III	1.4
4812-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I,III	3.1
4813-000	Open Road	2	Asphalt	Mixed-Use Route	Rock Creek	MU-I,III	0.5
4813-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I,III	0.7
4813-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I,III	0.3
4813-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I,III	1.2
4813-170	Open Road	2	Native Surface	Mixed-Use Route	Rock Creek	MU-I,III	0.2
4813-170	Open Road	1	Native Surface	Mixed-Use Route	Rock Creek	MU-I,III	0.6
4814-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I,III	2.5
4820-120	Open Road	2	Native Surface	Mixed-Use Route	Rock Creek	MU-I,III	1.1
4860-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I,III	0.8
4860-016	Decision Road	1	Native Surface	Mixed-Use Route	Rock Creek	MU-I,III	1.1
4860-150	Decision Road	1	Native Surface	Mixed-Use Route	Rock Creek	MU-I,III	0.3
TOTAL MILES OF ROADS PROPOSED AS OHV ROUTES							***136.0***

Appendix F
Alternative 3 Road Data

APPENDIX F: Alternative 3 Road Data

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
1630-660	Decision Road	2	Native Surface	Close to All Traffic	Bear Creek	CL	0.4
1640-651	Decision Road	2	Native Surface	Convert to Trail	Bear Creek	III	0.1
1630-660	Decision Road	2	Native Surface	Convert to Trail	Bear Creek	III	1.4
1612-641	Decision Road	2	Improved Native Surface	Convert to Trail	Bear Creek	III	0.3
1612-660	Decision Road	1	Improved Native Surface	Convert to Trail	Bear Creek	III	0.8
1640-650	Decision Road	2	Native Surface	Convert to Trail	Bear Creek	III	0.4
1612-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Bear Creek	MU-III	2.2
1640-000	Decision Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Bear Creek	MU-III	0.3
1630-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Bear Creek	MU-III	3.3
1640-620	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Bear Creek	MU-III	1.7
1700-012	Decision Road	1	Native Surface	Convert to Trail	Gibson	I, III	0.1
1710-644	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Gibson	MU-I, III	0.9
1710-640	Open Road	2	Native Surface	Mixed-Use Route	Gibson	MU-I, III	0.6
1711-000	Open Road	2	Native Surface	Mixed-Use Route	Gibson	MU-I, III	0.9
1710-000	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	Gibson	MU-I, III	0.0
1710-000	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	Gibson	MU-I, III	0.3
1710-000	Open Road (Not Maintained)	2	Improved Native Surface	Mixed-Use Route	Gibson	MU-I, III	0.6
1711-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Gibson	MU-I, III	1.2
4670-000	Secondary Low Clearance	3	Asphalt	Mixed-Use Route	Graham Pass	MU-I, II, III	0.0
4670-000	Secondary Low Clearance	3	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-I, II, III	7.8
4670-215	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-I, II, III	0.1

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
6350-037	Decision Road	2	Native Surface	Mixed-Use Route	Graham Pass	MU-I, II, III	0.6
4672-000	Open Road (Not Maintained)	2	Asphalt	Mixed-Use Route	Graham Pass	MU-I, II, III	0.4
6350-000	Secondary Low Clearance	3	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-I, II, III	9.6
6355-000	Secondary Low Clearance	3	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-I, II, III	0.2
6355-000	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-I, II, III	5.7
6355-000	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-I, II, III	3.5
4672-000	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-I, II, III	5.5
4672-000	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-I, II, III	7.9
4671-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-I, II, III	0.4
4671-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-I, II, III	5.2
6350-000	Secondary Low Clearance	3	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-I, II, III	2.6
6350-000	Secondary Low Clearance	3	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-I, II, III	1.0
6355-120	Decision Road	1	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-III	1.1
6310-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Graham Pass	MU-III	1.1
4611-132	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	LaDee Flat	CL	1.0
4611-014	Decision Road	1	Native Surface	Close to All Traffic	LaDee Flat	CL	0.2
4610-020	Decision Road	2	Native Surface	Close to All Traffic	LaDee Flat	CL	0.1
4610-018	Decision Road	2	Native Surface	Close to All Traffic	LaDee Flat	CL	0.1
4610-011	Decision Road	2	Improved Native Surface	Close to All Traffic	LaDee Flat	CL	0.6
4611-012	Decision Road	2	Native Surface	Close to All Traffic	LaDee Flat	CL	0.4

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4611-135	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	LaDee Flat	CL	0.6
4611-120	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	LaDee Flat	CL	0.5
4610-019	Decision Road	1	Native Surface	Close to All Traffic	LaDee Flat	CL	0.3
4610-115	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	LaDee Flat	CL	0.2
4610-017	Decision Road	2	Native Surface	Close to All Traffic	LaDee Flat	CL	0.3
4610-012	Decision Road	2	Native Surface	Close to All Traffic	LaDee Flat	CL	0.1
4610-115	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	LaDee Flat	CL	0.7
4610-015	Decision Road	2	Native Surface	Convert to Trail	LaDee Flat	I, II, III	0.3
4610-113	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	0.5
4610-014	Decision Road	1	Native Surface	Convert to Trail	LaDee Flat	I, II, III	0.7
4610-011	Decision Road	2	Improved Native Surface	Convert to Trail	LaDee Flat	I, II, III	0.0
4610-113	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	1.5
4610-112	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	0.9
4610-011	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	0.1
4610-013	Decision Road	2	Native Surface	Convert to Trail	LaDee Flat	I, II, III	0.2
4610-000	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	0.0
4610-000	Open Road (Not Maintained)	2	Native Surface	Convert to Trail	LaDee Flat	I, III	7.8
4611-125	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	0.2
4611-120	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	0.2
4611-130	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	1.8
4611-121	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	1.6

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4611-120	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	0.4
4610-115	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	1.2
4610-016	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	1.2
4610-018	Decision Road	2	Native Surface	Convert to Trail	LaDee Flat	I, III	0.0
4610-000	Secondary High Clearance	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	0.6
4610-024	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	0.2
4610-000	Secondary High Clearance	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	10.4
4610-000	Secondary Low Clearance	3	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	0.6
4611-000	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	1.5
4610-000	Secondary Low Clearance	3	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	4.1
4610-000	Secondary High Clearance	3	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	0.5
4610-000	Secondary High Clearance	3	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	0.1
4610-220	Decision Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	0.0
4610-120	Decision Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, III	0.0
2110-280	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.2
2110-260	Open Road (Not Maintained)	2	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.1
2110-261	Open Road	2	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.1
2110-240	Open Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.0
2120-331	Open Road	2	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.0

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
2120-370	Open Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.2
2120-370	Open Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.1
2120-330	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	2.3
2130-250	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.1
2130-270	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.9
4310-221	Decision Road	1	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.2
2110-030	Decision Road	2	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.1
2110-021	Decision Road	2	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.3
2120-013	Open Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.6
2110-020	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.4
4310-241	Decision Road	1	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.1
2130-270	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.6
2110-230	Open Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.4
2120-017	Decision Road	1	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.3
2120-011	Decision Road	2	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.4
2120-330	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.2
2130-016	Decision Road	2	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.0
4310-242	Decision Road	1	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.1
4310-011	Decision Road	1	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.2
2110-018	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	I, III	0.1
2120-331	Open Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.1
2120-370	Open Road	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	I, III	0.3

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
2110-240	Open Road	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	I, III	1.3
2120-360	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	I, III	0.9
2130-016	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.4
2130-014	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.2
2110-017	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.3
2110-260	Open Road (Not Maintained)	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.6
2110-260	Open Road (Not Maintained)	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.8
2110-022	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.3
2120-011	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.7
2120-330	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	I, III	0.4
2110-261	Open Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.2
2110-251	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.4
2120-371	Open Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.3
2110-030	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	III	0.1
2110-029	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	III	0.4
2130-250	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	III	0.9
2130-270	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	III	1.0
2110-280	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	III	0.1
2110-280	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	III	0.2
2110-282	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	III	0.3
4310-250	Open Road (Not Maintained)	2	Native Surface	Convert to Trail	McCubbins Gulch	III	0.4
4310-220	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	III	1.0
4310-014	Decision Road	2	Improved Native Surface	Convert to Trail	McCubbins Gulch	III	0.7
4310-222	Decision Road	1	Native Surface	Convert to Trail	McCubbins Gulch	III	0.4

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
2110-019	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	III	0.2
2110-018	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	III	0.2
2110-031	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	III	0.2
2110-281	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	III	0.3
4310-011	Decision Road	1	Native Surface	Convert to Trail	McCubbins Gulch	III	1.3
2130-271	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	III	0.4
4310-240	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	III	0.5
4310-221	Decision Road	1	Native Surface	Convert to Trail	McCubbins Gulch	III	1.0
2110-270	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	McCubbins Gulch	MU-I, III	1.3
2110-272	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	McCubbins Gulch	MU-I, III	0.5
2110-272	Open Road	2	Native Surface	Mixed-Use Route	McCubbins Gulch	MU-I, III	0.2
4310-000	Secondary High Clearance	2	Crushed Aggregate or Gravel	Mixed-Use Route	McCubbins Gulch	MU-I, III	1.3
2820-000	Secondary High Clearance	2	Crushed Aggregate or Gravel	Mixed-Use Route	Mt. Defiance	MU-I, III	1.0
2820-620	Open Road	2	Native Surface	Mixed-Use Route	Mt. Defiance	MU-I, III	0.4
2821-621	Open Road	2	Native Surface	Mixed-Use Route	Mt. Defiance	MU-I, III	0.1
2821-000	Open Road (Not Maintained)	2	Improved Native Surface	Mixed-Use Route	Mt. Defiance	MU-I, III	0.1
2821-000	Open Road (Not Maintained)	2	Improved Native Surface	Mixed-Use Route	Mt. Defiance	MU-I, III	2.1
2821-630	Decision Road	2	Native Surface	Mixed-Use Route	Mt. Defiance	MU-I, III	0.8
2821-620	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Mt. Defiance	MU-I, III	0.6
2821-000	Open Road (Not Maintained)	2	Native Surface	Mixed-Use Route	Mt. Defiance	MU-I, III	0.4
4660-014	Decision Road	1	Native Surface	Close to All Traffic	Peavine	CL	0.2
5731-015	Decision Road	2	Native Surface	Close to All Traffic	Peavine	CL	0.2

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4660-120	Decision Road	1	Native Surface	Close to All Traffic	Peavine	CL	0.2
4210-043	Decision Road	2	Native Surface	Close to All Traffic	Peavine	CL	0.3
4200-570	Decision Road	1	Native Surface	Close to All Traffic	Peavine	CL	1.6
4661-141	Open Road	2	Native Surface	Close to All Traffic	Peavine	CL	0.9
4661-200	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	1.3
4661-164	Decision Road	2	Native Surface	Close to All Traffic	Peavine	CL	1.3
4661-031	Decision Road	1	Native Surface	Close to All Traffic	Peavine	CL	0.1
4661-012	Decision Road	1	Native Surface	Close to All Traffic	Peavine	CL	0.2
5732-011	Decision Road	2	Native Surface	Close to All Traffic	Peavine	CL	0.3
5731-015	Decision Road	2	Native Surface	Close to All Traffic	Peavine	CL	0.1
4661-190	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.6
4661-160	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.9
4661-150	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	1.0
4660-013	Decision Road	1	Native Surface	Close to All Traffic	Peavine	CL	0.1
4661-162	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.6
4661-018	Decision Road	1	Improved Native Surface	Close to All Traffic	Peavine	CL	0.2
4660-160	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	1.0
5731-016	Decision Road	2	Native Surface	Close to All Traffic	Peavine	CL	0.4
5732-014	Decision Road	2	Native Surface	Close to All Traffic	Peavine	CL	0.3
4661-193	Decision Road	1	Improved Native Surface	Close to All Traffic	Peavine	CL	0.4
4661-166	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.2
4661-020	Decision Road	1	Native Surface	Close to All Traffic	Peavine	CL	0.1
4661-145	Open Road	2	Native Surface	Close to All Traffic	Peavine	CL	0.8
	Decision Road	1	Native Surface	Close to All Traffic	Peavine	CL	0.4
4200-520	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.1
4210-042	Decision Road	1	Native Surface	Close to All Traffic	Peavine	CL	0.1

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4660-180	Decision Road	2	Native Surface	Close to All Traffic	Peavine	CL	0.1
4661-143	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.3
4660-140	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.3
4660-170	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.1
5732-013	Decision Road	2	Native Surface	Close to All Traffic	Peavine	CL	0.3
4660-140	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.7
4660-120	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.5
4660-120	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	Peavine	CL	0.6
4660-130	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	0.6
5732-011	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	0.3
5732-013	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	1.0
4210-040	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	0.2
4660-020	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, III	0.7
4661-019	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, III	0.3
5731-020	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	0.3
5731-116	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	0.1
5731-120	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	1.8
4660-120	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	0.7
5731-116	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, III	0.9
5731-116	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	0.5
4661-029	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, III	0.2
4661-170	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	0.9
4661-133	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	0.2
4661-133	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	0.1

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4660-150	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	1.1
4661-120	Decision Road	1	Improved Native Surface	Convert to Trail	Peavine	I, III	1.0
4210-044	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	0.7
4210-350	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	1.1
4210-350	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	1.5
4210-041	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	0.5
4661-140	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	1.3
4660-180	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	0.7
4660-180	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	0.2
4660-016	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, III	0.4
4661-013	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	0.5
4661-026	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, III	1.1
4660-170	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	1.2
4660-140	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	1.9
5732-016	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	0.4
5731-118	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	0.4
4661-011	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, III	0.1
4661-140	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	1.0
4661-030	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, III	0.1
4661-205	Decision Road	1	Native Surface	Convert to Trail	Peavine	I, III	1.0
5732-012	Decision Road	2	Native Surface	Convert to Trail	Peavine	I, III	0.4
4200-520	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Peavine	I, III	2.4
4661-141	Open Road	2	Native Surface	Convert to Trail	Peavine	I, III	0.8
5731-000	Decision Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I, III	0.4

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
5731-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I, III	2.0
4660-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I, III	1.5
4661-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I, III	2.2
5732-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I, III	0.7
4661-180	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I, III	1.5
4661-130	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I, III	0.7
4661-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I, III	0.2
4200-032	Decision Road	2	Native Surface	Mixed-Use Route	Peavine	MU-I, III	1.7
4661-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Peavine	MU-I, III	0.8
4820-140	Decision Road	2	Native Surface	Close to All Traffic	Rock Creek	CL	0.0
4820-016	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	Rock Creek	CL	0.2
4841-120	Decision Road	2	Native Surface	Close to All Traffic	Rock Creek	CL	0.2
4811-029	Decision Road	2	Native Surface	Close to All Traffic	Rock Creek	CL	0.4
4820-018	Decision Road	2	Native Surface	Close to All Traffic	Rock Creek	CL	0.6
4812-142	Decision Road	2	Native Surface	Close to All Traffic	Rock Creek	CL	0.2
4811-024	Decision Road	1	Native Surface	Close to All Traffic	Rock Creek	CL	0.2
4811-028	Decision Road	2	Native Surface	Close to All Traffic	Rock Creek	CL	0.2
4840-120	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	Rock Creek	CL	0.1
4800-011	Decision Road	2	Native Surface	Close to All Traffic	Rock Creek	CL	0.1
4830-120	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Close to All Traffic	Rock Creek	CL	0.3
4820-016	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	Rock Creek	CL	0.2
4820-151	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	Rock Creek	CL	0.1

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4820-155	Decision Road	2	Native Surface	Close to All Traffic	Rock Creek	CL	0.1
4812-140	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	Rock Creek	CL	0.2
4812-141	Decision Road	2	Native Surface	Close to All Traffic	Rock Creek	CL	1.1
4840-120	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	1.2
4841-120	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.3
4840-014	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.3
4811-200	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.5
4811-200	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.1
4830-012	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	1.0
4830-016	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.8
4800-011	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.5
4830-120	Open Road (Not Maintained)	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	1.1
4820-017	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.7
4811-029	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.2
4820-150	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.3
4813-140	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.4
4811-220	Open Road (Not Maintained)	1	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	1.5
4860-180	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.2
4870-120	Decision Road	2	Improved Native Surface	Convert to Trail	Rock Creek	I, III	2.2
4820-016	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.2
4820-153	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.1
4820-150	Open Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	2.3
4820-153	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.4

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4820-152	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	1.1
4812-160	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.5
4800-240	Open Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.0
4814-120	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.8
4814-130	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.6
4800-240	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	1.1
4813-160	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.8
4812-130	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.3
4812-140	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.1
4814-130	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.4
4812-140	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.6
4813-170	Open Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.8
4860-130	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	1.1
4860-017	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.6
4860-130	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.4
4860-016	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	1.1
4860-015	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.5
4860-130	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.1
4860-150	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.3
4860-150	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.3
4800-240	Open Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.0
4820-132	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.5
4820-131	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.5
4820-131	Open Road	2	Native Surface	Mixed-Use Route	Rock Creek	MU-I, III	0.4

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4811-000	Secondary High Clearance	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.9
4813-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.2
4813-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	1.2
4840-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.5
4870-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	1.2
4860-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.8
4860-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.7
4860-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	1.2
4860-000	Open Road	2	Native Surface	Mixed-Use Route	Rock Creek	MU-I, III	0.7
4860-140	Open Road	2	Native Surface	Mixed-Use Route	Rock Creek	MU-I, III	3.6
4830-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	1.7
4800-241	Decision Road	2	Improved Native Surface	Mixed-Use Route	Rock Creek	MU-I, III	0.4
4813-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.6
4814-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	2.5
4870-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.4
4812-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	3.1
4860-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.7
4811-000	Secondary High Clearance	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	3.3
4811-000	Secondary High Clearance	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	1.4
TOTAL MILES OF ROADS PROPOSED AS OHV ROUTES							***257.9***

Appendix G
Alternative 4 Road Data

APPENDIX G: Alternative 3 Road Data

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4611-135	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	LaDee Flat	CL	0.6
4610-019	Decision Road	1	Native Surface	Close to All Traffic	LaDee Flat	CL	0.3
4610-017	Decision Road	2	Native Surface	Close to All Traffic	LaDee Flat	CL	0.3
4611-012	Decision Road	2	Native Surface	Close to All Traffic	LaDee Flat	CL	0.4
4611-132	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	LaDee Flat	CL	1.0
4611-014	Decision Road	1	Native Surface	Close to All Traffic	LaDee Flat	CL	0.2
4610-020	Decision Road	2	Native Surface	Close to All Traffic	LaDee Flat	CL	0.1
4610-018	Decision Road	2	Native Surface	Close to All Traffic	LaDee Flat	CL	0.1
4610-011	Decision Road	2	Improved Native Surface	Close to All Traffic	LaDee Flat	CL	0.6
4611-120	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	LaDee Flat	CL	0.5
4610-115	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	LaDee Flat	CL	0.2
4610-012	Decision Road	2	Native Surface	Close to All Traffic	LaDee Flat	CL	0.1
4610-115	Decision Road	1	Crushed Aggregate or Gravel	Close to All Traffic	LaDee Flat	CL	0.7
4610-011	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	0.1
4610-013	Decision Road	2	Native Surface	Convert to Trail	LaDee Flat	I, II, III	0.2
4610-015	Decision Road	2	Native Surface	Convert to Trail	LaDee Flat	I, II, III	0.3
4610-113	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	0.5
4610-014	Decision Road	1	Native Surface	Convert to Trail	LaDee Flat	I, II, III	0.7
4610-011	Decision Road	2	Improved Native Surface	Convert to Trail	LaDee Flat	I, II, III	0.0
4610-113	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	1.5
4610-112	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, II, III	0.9
4611-125	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	0.2

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4611-120	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	0.2
4611-130	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	1.8
4611-121	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	1.6
4611-120	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	0.4
4610-115	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	1.2
4610-016	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	LaDee Flat	I, III	1.2
4610-018	Decision Road	2	Native Surface	Convert to Trail	LaDee Flat	I, III	0.0
4610-000	Secondary High Clear-ance	3	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	0.5
4610-000	Secondary High Clear-ance	3	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	0.1
4610-000	Secondary Low Clearance	3	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	0.6
4610-000	Secondary Low Clearance	3	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	4.1
4610-024	Open Road (Not Main-tained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	0.2
4611-000	Open Road (Not Main-tained)	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	1.5
4610-000	Secondary High Clear-ance	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, II, III	2.2
4610-120	Decision Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	LaDee Flat	MU-I, III	0.0
2110-230	Open Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.4
2110-260	Open Road (Not Main-tained)	2	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.1
2120-370	Open Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.2
2120-017	Decision Road	1	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.3

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
2120-011	Decision Road	2	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.4
2120-330	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	2.3
2120-330	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.2
2130-016	Decision Road	2	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.0
2110-240	Open Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.0
2120-013	Open Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.6
2110-021	Decision Road	2	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.3
2110-020	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.4
2110-018	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.2
2110-261	Open Road	2	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.1
2120-331	Open Road	2	Native Surface	Close to All Traffic	McCubbins Gulch	CL	0.0
2120-370	Open Road	2	Crushed Aggregate or Gravel	Close to All Traffic	McCubbins Gulch	CL	0.1
2110-018	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	I, III	0.1
2110-261	Open Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.2
2110-251	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.4
2120-331	Open Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.1
2120-360	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	I, III	0.2
2120-370	Open Road	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	I, III	0.3
2110-240	Open Road	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	I, III	1.3
2120-360	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	I, III	0.7
2120-371	Open Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.3
2120-330	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	McCubbins Gulch	I, III	0.4

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
2120-011	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.1
2130-014	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.2
2130-016	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.4
2110-017	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.3
2110-260	Open Road (Not Maintained)	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.6
2110-260	Open Road (Not Maintained)	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.8
2110-022	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.3
2120-011	Decision Road	2	Native Surface	Convert to Trail	McCubbins Gulch	I, III	0.5
4811-024	Decision Road	1	Native Surface	Close to All Traffic	Rock Creek	CL	0.2
4811-028	Decision Road	2	Native Surface	Close to All Traffic	Rock Creek	CL	0.2
4812-140	Decision Road	2	Crushed Aggregate or Gravel	Close to All Traffic	Rock Creek	CL	0.2
4812-142	Decision Road	2	Native Surface	Close to All Traffic	Rock Creek	CL	0.2
4812-141	Decision Road	2	Native Surface	Close to All Traffic	Rock Creek	CL	1.1
4811-200	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.5
4813-140	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.4
4811-220	Open Road (Not Maintained)	1	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	1.5
4812-160	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.5
4800-240	Open Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.0
4800-240	Open Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.0
4814-120	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.8
4814-130	Decision Road	1	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.6
4800-240	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	1.1
4813-160	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.8
4812-130	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.3
4812-140	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.1

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4813-170	Open Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.6
4813-170	Open Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.2
4860-130	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	1.1
4860-017	Decision Road	2	Native Surface	Convert to Trail	Rock Creek	I, III	0.6
4860-130	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.4
4860-016	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	1.1
4860-015	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.5
4814-130	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.4
4812-140	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.6
4860-130	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.1
4860-150	Decision Road	1	Native Surface	Convert to Trail	Rock Creek	I, III	0.3
4860-180	Decision Road	2	Crushed Aggregate or Gravel	Convert to Trail	Rock Creek	I, III	0.2
4870-120	Decision Road	2	Improved Native Surface	Convert to Trail	Rock Creek	I, III	2.2
4811-000	Secondary High Clear-ance	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.8
4811-000	Secondary High Clear-ance	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	3.3
4811-000	Secondary High Clear-ance	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	1.4
4800-241	Decision Road	2	Improved Native Surface	Mixed-Use Route	Rock Creek	MU-I, III	0.4
4813-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.6
4813-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.2
4814-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	2.5
4813-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	1.2
4870-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.4

Forest Service Road Number	2003 Roads Analysis ATM Strategy	Road Maintenance Level	Road Surface	OHV Route Designation	OHV Location	OHV Class	Miles
4812-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.1
4812-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	3.1
4870-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	1.2
4860-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.8
4860-000	Open Road	2	Crushed Aggregate or Gravel	Mixed-Use Route	Rock Creek	MU-I, III	0.7
TOTAL MILES OF ROADS PROPOSED AS OHV ROUTES							***71.8***

Appendix H
Range of Natural Variability

APPENDIX H: Range of Natural Variability

Watershed Analysis	Range of Natural Variability
Clackamas River - Oak Grove Fork	"In contrast to the eastern portion of the watershed which has been only slightly modified by erosion, erosional processes dominate the landscape in the western portion of the watershed. This is due to weaker and older geological units which have resulted in deeply incised drainages and steep slopes often over 70%. The weak materials and steep slopes contribute to many landslides in the western portion. The Lower Oak Grove channel is constricted by large ancient landslide deposits, which could reactivate and encroach upon the river" (pg. 5).
Collawash/Hot Springs	"Major sediment sources are consistently associated with drainages or steep, unstable slope conditions. The dominant processes influencing sediment production and delivery in the watershed are mass wasting and fluvial dynamics . . . Sediment is produced and delivered directly into water courses by distinct mechanism and events such as: debris slides, debris flows, and translational failures . . . The ancient landslide landforms (earthflows) are primary contributors of fine sediment to water courses" (pg. 2-15).
East Fork Hood River & Middle Fork Hood River	"Landslides and debris flows have been common in much of the [East Fork Hood River] watershed and have had a significant affect on the East Fork drainage system" (pg. 3-5). "Landslides and debris flow are historically common only within the upper reaches of the watershed and mostly within Coe and Eliot Branches" (pg. 3-22).
Fish Creek	"[M]ass wasting is a dominant process affecting the aquatic ecosystems of Fish Creek" (Appendix A, pg. 48). "A consequence of increased mass movement frequencies has been greater delivery of sediment to stream systems in Fish Creek" (pg. 51)
Hood River (Hood River SWCD)	"Many streams in the Hood River Watershed have a naturally high sediment load due to geology, terrain and glacial runoff. . . Most natural sediment transport occurs only every decade or so during the highest storm flows, and lasts a few days" (pg. 98)
Lower Clackamas River	"Erosion potential of soils in the watershed is predominantly high. This is attributed to the abundance of soil types derived from pyroclastic and igneous parent materials that are either readily broken down by weathering or occur on steep slopes (>30%). Yet many of these very erosive soil types exist on slopes less than 30%, they can be found on portions of the earthflow landforms that have gentle relief" (pg. 2-30).
Mosier (Wasco SWCD)	"Mosier Creek Watershed includes areas of The Dalles Formation and Bretz flood sediments. The Dalles Formation is a unit of mixed sedimentary material and volcanic ash deposited on top of the underlying basalt in the Mosier Syncline (low). Mosier Creek collects a lot of sand and fine sediments from The Dalles Formation. On the other hand, Rock Creek includes very little fine material, because its geology is dominated entirely by basalt formations" (pg. 4). Natural sources of sediment include "landslides and burns" (pg. 30). "Sedimentation can also be related to land use through road runoff (urban and rural) or road failure, and surface erosion on crop or rangeland" (pg. 30).
North Fork Clackamas River	"Historically, sediment delivery was more episodic than continual with high levels of delivery occurring during periods following recent large scale fires and floods. Casual agents for the sediment delivery were rain-on-snow events, flood or landslides" (pg. 2-7).
Roaring River	"[M]uch of the upper drainage, especially the sideslopes, is very rocky and mantled with shallow soils" (pg. 51). "Most of the mass wasting potential occurs in the lower drainage where unstable geologic conditions are present" (pg. 51). "The function of mass wasting events in the sediment regime of the watershed contribute to the upper range of natural sediment production variability. Events are the "pulses" of sediment delivery which are closely related to large precipitation events (such as rain-on-snow) of the winter and runoff events of the spring...Present ranges of sediment delivering landslides in the watershed are not believed to be outside of the background or natural ranges" (pg. 52). "Soil conditions in the Roaring River watershed have been relatively unaffected by human disturbances" (pg. 52). "Erosion potential of soils in the watershed is predominately low to moderate" (pg. 53).

Watershed Analysis	Range of Natural Variability
Salmon River	"Mass wasting is the primary source of sediment in the lower watershed (Salmon, Boulder, Cheeney, Lower Salmon, South Fork/Mac Hall, and Middle Salmon watersheds). Sediment supply in the lower portion of the watershed is tied to high intensity, low frequency rainfall events which are thought to initiate debris slides and debris flows in the colluvial headwaters" (pg. 4-58). "The average annual rate of surface erosion is predicted to be much lower than that for mass wasting in the lower watershed. However, surface erosion supplies a chronic background rate of sediment above undisturbed conditions as compared to the infrequent, large pulses of mass wasting events" (pg. 4-59)
South Fork Clackamas River	"Historically, sediment delivery from roads and timber harvest was more episodic than continual with high levels of delivery occurring during periods following recent large scale fires and floods. Casual agents for the sediment delivery were rain-on-snow events, flood or landslides" (pg 2-13). "Natural and undisturbed rates of erosion for the landform types within the South Fork watershed are unknown" (pg. 2-14).
Upper Clackamas River	"The highest rates of sediment delivery are associated with landforms that are steeply sloping and consist of weak or resistent rock types. These landforms occupy 11% of the Upper Clackamas watershed and are found primarily in the Northwest and West Group subwatersheds. A medium sediment delivery rating was given to quarternary landslide deposits, glaciated valley side slopes, and alluvial valley bottoms and terraces. These landforms occupy approximately 23% of the watershed, and are distributed throughout its northern and western portions. A low sediment delivery rating was given to the remaining landforms (68% of the watershed), most of which have gentle to moderate slopes. Talus receive a low rating despite its steep slopes, because it is incapable of producing appreciable amounts of sediment" (pg. 129).
White River	"Sediment input to streams also appears to have been more episodic than continual. Rain-on-snow events could result in high levels of erosion and rockfall on steeper slopes in the Transition and Eastside Zones. The Crest Zone would occasionally see similar effects, but at much more infrequent intervals due to the more consistent snowpack. High intensity rainstorms shortly after a high severity stand-replacing fire would also generate large sediment input. If what we believe about potential fire severity in upper Boulder Creek is true, then significant levels of sediment input to Boulder Creek and White River probably occurred 1-5years after this portion of the subwatershed burned" (pg. 4-10).

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