United States

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Forest Service

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Welcome Station

Trail Connections Project Environmental Assessment

Bend-Fort Rock Ranger District
Deschutes National Forest
Deschutes County, Oregon

Township 18 South, Range 11 East, Sections 5, 14, 15, 17, 20, 21, 22, 28, 32, 33
Willamette Meridian

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COMMONLY USED ACRONYMS

Acronyms	
ABA	Architectural Barriers Act
AASHTO	American Association of State Highway and Transportation Officials
BA	Biological Assessment
BBC	Birds of Conservation Concern
BE	Biological Evaluation
BMP	Best Management Practices
BO	Biological Opinion
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
COTA	Central Trail Alliance
DEQ	Department of Environmental Quality
DNF	Deschutes National Forest
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act of 1973, as amended
FS	Forest Service
FSH	Forest Service Handbook
FSM	Forest Service Manual
FSR	Forest Service Road
FSTAG	Forest Service Trail Accessibility Guidelines
GIS	Geographical Information System
IDT	Interdisciplinary Team or ID team
KEA	Key Elk Area
LRMP	Deschutes National Forest Land and Resource Management Plan also referred to as Forest Plan
MIS	Management Indicator Species
NEPA	National Environmental Policy Act
NFS	National Forest System
NFR	National Forest Roads
NFMA	National Forest Management Act
NRF	Nesting, Roosting, and Foraging Habitat (Spotted Owl)
ODOT	Oregon Department of Transportation
ODFW	Oregon Department of Fish and Wildlife
ORV	Outstandingly Remarkable Values
PDC	Project Design Criteria
RHCA	Riparian Habitat Conservation Area
ROS	Recreation Opportunity Spectrum
S&Gs	Standards and Guidelines
TES	Threatened, Endangered and, Sensitive Species
USFWS	United States Fish and Wildlife Service
Abbreviations	

dbh Diameter at breast height

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CHAPTER 1: PURPOSE AND NEED FOR ACTION

CHANGES BETWEEN THE 30-DAY EA AND FINAL EA

Concerns from public comments during the scoping and 30-day comment periods discussed the safety of the surface crossing. Additional explanation for Trail 1a's surface crossing in section 1.9.1, issue number 6 was added. Additional discussion over this subject matter is included in Appendix C Public Comments.

1.1 INTRODUCTION

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

Purpose and Need for Action: This section includes information on the history of the project proposal, the purpose of and need for the project, the proposal for achieving that purpose and need, and key issues used to formulate alternatives, develop mitigation, and track effects and other issues that did not drive alternatives but were addressed in this analysis.

Alternatives: This section provides a more detailed description of the proposed action as well as alternative methods for achieving the stated purpose. This discussion also includes mitigation measures.

Environmental Consequences: This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource areas (i.e. recreation, wildlife, botany). Within each section, the effect of the no action alternative provides a baseline for evaluation and comparison of the other alternatives that follow are described in this section.

Consultation and Coordination: This section provides a list of prepares and agencies consulted during the development of the environmental assessment.

Appendices: The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project area resources, data specific to the project, public notifications and their responses, and miscellaneous documentation, may be found in the project record located at the Bend-Fort Rock Ranger District, Bend, Oregon.

1.2 BACKGROUND

The promotion of alternative transit options and enhanced access to trail networks close to urban areas is strongly supported by the gateway communities that are portals to public lands. The City of Bend and local community have developed goals for multi-modal paths and connections between the city and public lands (Bend 2030 Community Vision). One of the vision elements is for a system of multi-modal alternative forms of transportation that balances recreation and protects the forest ecosystem. A 2008 report from the Deschutes County Committee on Recreation Assets, which was brought together by Senator Wyden to work with organizations and communities to enhance recreation resources,

recommended that Deschutes County establish itself as a premier destination for road-cycling and mountain biking. One opportunity that was highlighted was the potential to pave a multi-use path between Bend and Sunriver along Forest Service Road (FSR) 41. The Haul Road, Alpine, Cascade Highlands and Skyliners trails, managed by Bend Metro Park and Recreation District (Bend Park and Recreation), provide connections for bicyclists and pedestrians from the city onto the Forest to the Deschutes River and Phil's trail systems. The 2008 Bend Park and Recreation District Trails Master Plan identifies the Haul Road trail as a primary bicycle and pedestrian trail with intent to pave the trail to the Forest boundary.

In 1998, the Cascade Lakes Highway was designated a National Scenic Byway because of its outstanding scenic, natural and recreational qualities, regional significance to visitors, and enhancement of livability for central Oregon residents accessing public lands through the Byway. The Cascade Lakes Scenic Byway Corridor Management Plan, originally developed in 1996 and updated in 2011, was designed to protect and preserve the Byways intrinsic scenic, natural, and recreational qualities for future generations by enhancing and maintaining its image, identity, and integrity through collaborative partnerships and community connections. Based upon community input, the Plan identifies enhancement and development priorities for the corridor. A visitor information center (Cascade Lakes Scenic Byway Welcome Station, referred to as Welcome Station) was identified as the first priority and development of a trailhead and interpretive site near the Forest boundary with Bend to provide parking for forest users and tell the story of the 1990 Awbrey Hall fire is the second priority. The Plan also identifies one strategy to accomplish the goal of preserving the Byway as a major attraction in the Pacific Northwest is to create hubs for trail connectivity and multi-modal transit opportunities.

The Decision to construct the Cascade Lakes Scenic Byway Welcome Station was made in April 2010 to provide a quality facility in a convenient location where Forest Service staff and community volunteers could provide information and interpretive services to many of the over 2.5 million annual visitors to the Deschutes National Forest. The architectural design for the Welcome Station is underway and construction is planned to begin in 2014. This project incorporates a trail connecting the eastside of the Welcome Station site to the Cash on Delivery (COD) mountain bike trail, providing access from the Station to the summer trail system, and a parking area designed to accommodate 15 vehicles for summer day-use activities.

With a shared vision for trail connections between Bend, Sunriver, and the Welcome Station in mind, Oregon Department of Transportation (ODOT) constructed a bicycle and pedestrian underpass east of the intersection of FSR 46 and 41 during the 2012 Century Drive/Cascade Lakes Highway road maintenance project (hereafter referred to as the Cascade Lakes Highway undercrossing).

In 2012, the Forest Service began meeting with local stakeholders including Central Oregon Trail Alliance (COTA), Deschutes County Committee on Recreation Assets, and Bend Parks and Recreation to discuss goals for trail connections between Bend and the Welcome Station that would align with the vision and goals established by the Forest, the City of Bend, stakeholders and community members. Ideas brought forward included: providing trails to connect the City of Bend with the Forest and the Welcome Station, working toward a vision of a paved multi-use path between Bend and Sunriver, construction of a mountain bike trail parallel to FSR 41 that would connect Storm King and the soon to be constructed Tyler's Traverse trails to COD trail (providing access to Bend and to Phil's trails), access to easier mountain bike trails and connections to the Phil's trail system from the Welcome Station and providing connections from Seventh Mountain Resort to the Forest trail system and the Welcome Station.

The Forest received a grant from the Federal Highway Administration's National Scenic Byways Program in 2012 for the planning, design, and potential future construction of a non-motorized paved

path and a trailhead between Bend and the new Cascade Lakes Scenic Byway Welcome Station and mountain bike trails connecting the Welcome Station to existing trail systems, which has led to this project.

1.3 PROJECT AREA DESCRIPTION

The Welcome Station Trail Connections project is located on the Bend-Fort Rock Ranger District on the Deschutes National Forest (DNF) west of the City of Bend. The project area includes areas parallel to the Cascade Lakes Scenic Byway (also known as Highway 46, Cascade Lakes Highway) from the Forest boundary to the Welcome Station, areas parallel to FSR 41 between the Slough Day Use access road and Highway 46, and areas within the Phil's trail system between the Welcome Station and Skyliners road (FSR) 4601 (Figure 1-1).

The project area identified is much larger than proposed trails, the reason being was to encompass all the trail connections that proposed trails could provide access to. This area as described in the existing condition is a very popular outdoor recreation area.

Legal descriptions are as follows: Township 18 South, Range 11 East, Sections 5, 14, 15, 17, 20, 21, 22, 28, 32, and 33.

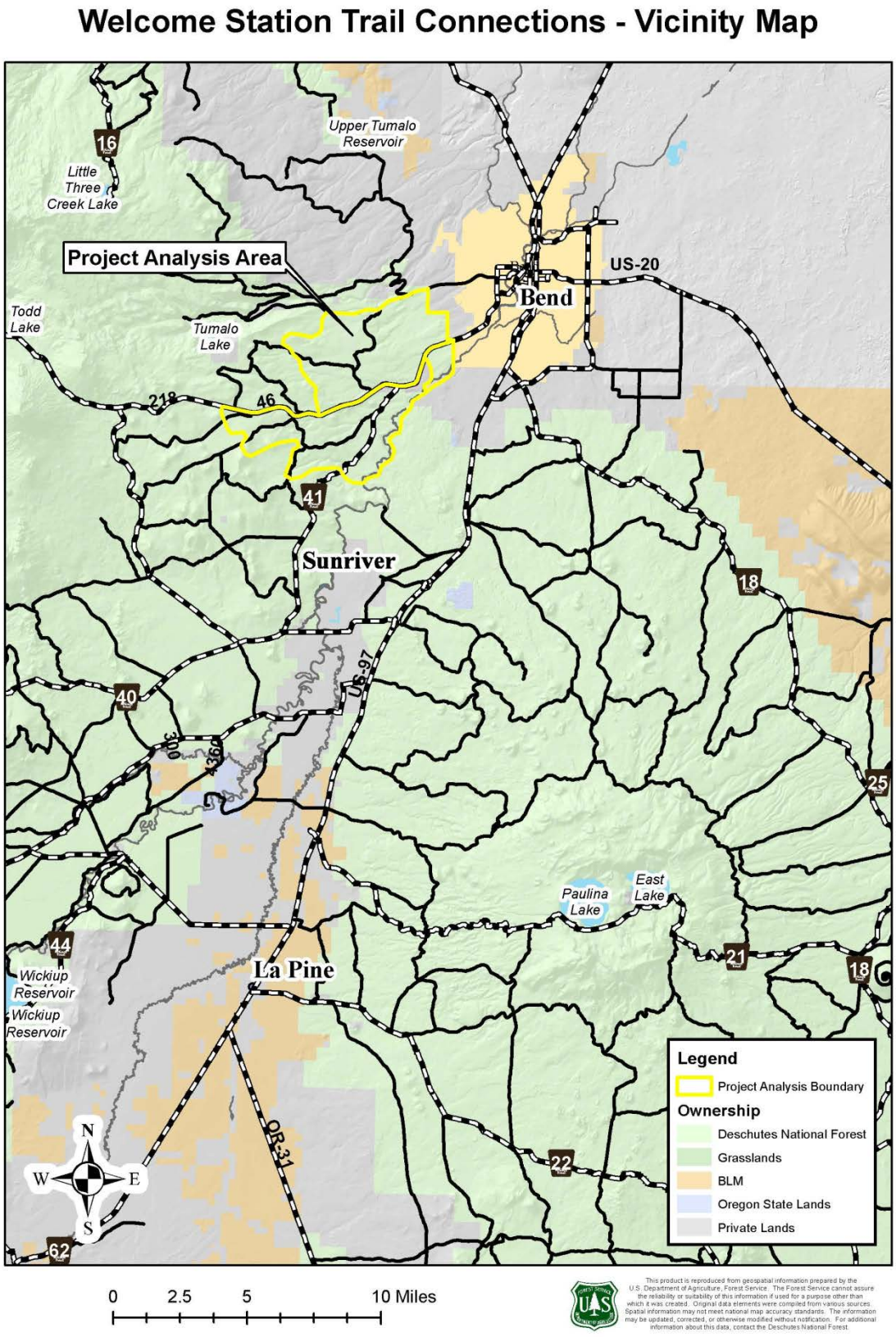

Figure 1-1: Welcome Station Trail Connections Vicinity Map

1.4. EXISTING CONDITION

The project area as a whole is located adjacent to the community of Bend and encompasses some of the most popular outdoor recreation areas for residents, visitors, permitted recreation businesses and regional and national events. Recreation areas in the project area have been divided into three zones: a) Entrada zone, b) Phil's trail zone, and c) the Wanoga and Deschutes River trail zones.

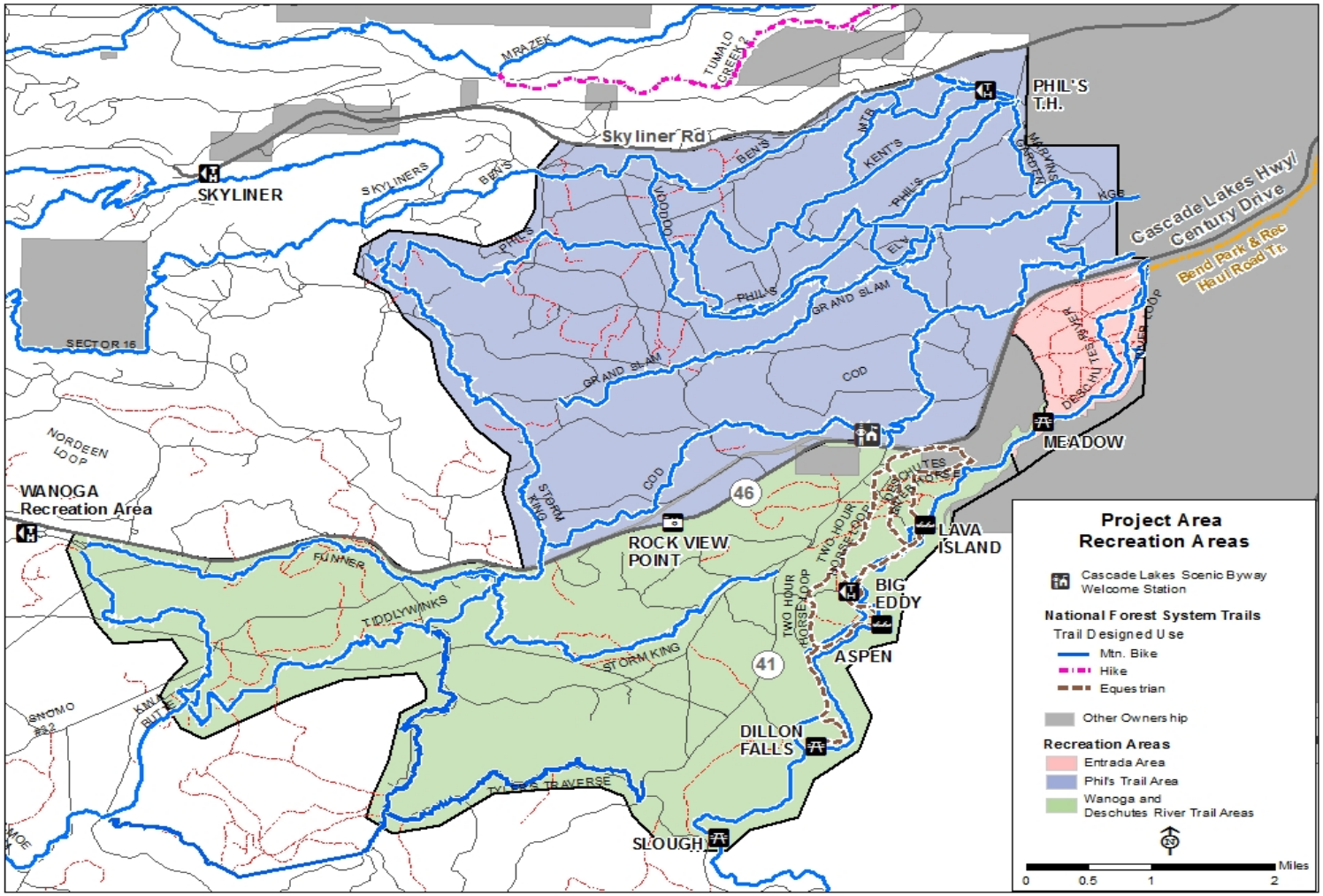

Figure 1-2 Recreation Zones within the Analysis Area

Entrada Zone

The Entrada area is between Bend, Meadow roads, Cascade Lakes Highway and the Deschutes River. The primary uses in this area are walking, running, and biking. The Deschutes River, River Loop and Entrada Loop trails are all within this recreation area. The Bend Park and Recreation Haul Road trail connects to the Deschutes River trail at the Forest boundary. Roads that have been closed to motorized vehicles are being used by runners and walkers. Entrada includes an area locally referred to as Good Dog!, which is popular with visitors recreating with dogs. Informal parking, off the Cascade Lakes Highway, along the access to the utility maintenance road and the Meadow road turn-off, has developed to access Good Dog!. It is estimated that this current dispersed parking area is 11,325 square feet.

Phil's Trailhead Zone

Phil's includes the area north of Cascade Lakes Highway between Bend, Storm King mountain bike trail and Skyliners road. The primary uses in this area include walking, running and biking. This area includes the popular Phil's trail system; these trails are very popular with mountain bikers, hikers and runners. Recreational trails in this area are highly used during the spring, fall and summer months use of trails is even popular. Developed parking for users of Phil's trail system are at Phil's, Skyliners and Swampy Lakes trailheads. Informal parking has developed along Skyliners road.

Wanoga and Deschutes River Zone

The Wanoga and Deschutes River area includes lands south of Cascade Lake Highway to the Deschutes River. The Wanoga trails are primarily used by mountain bikers with permitted mountain bike events taking place in spring and fall. The primary uses in the area include walking, biking, running, equestrian use, non-motorized river users, and picnicking. Use is relatively high from spring to late fall. Swampy Lakes and Wanoga trailheads serves as the primary developed parking for this area. Meadow, Lava Island, Big Eddy, Dillon and Slough day use sites serve as trailheads for hikers and bikers, providing river access and picnic sites. Informal parking areas have developed along FSR 41 and Cascade Lakes Highway to access the Wanoga trail system. The equestrian trails in the area include the Deschutes River horse trails, Dillon Falls horse trail and the trails developed for use by the clients of the Seventh Mountain Resort, but open to the public.

The 20,273 acre project area has approximately 89.3 miles of open roads, 17.3 miles of roads closed (Maintenance Level 1) to public motorized use and 31.2 miles of roads that have been actively decommissioned. Open road density for the project area is approximately 2.81 miles per square mile.

There are approximately 101.7 miles of designated trails in the project area of these miles 83.8 miles have been designed for bicycles. Other designations include equestrian (8.5 miles), hike/pedestrian (0.6 miles), and snowmobile trails (9.3 miles). Designated trail density for the project area is approximately 3.21 miles per square mile. The majority of the trails are located on the eastern side of the project area extending north into the Phil's trail system.

1.5 PURPOSE AND NEED

The purpose and need for action is generated by the difference between current conditions and desired conditions. Desired conditions are based on goals and management direction provided in the Deschutes National Forest Land and Resource Management Plan (USDA 1990).

Existing Condition

The project area incorporates some of the most popular outdoor recreation trails on the Forest (Section 1.4) also the Cascade Lakes Highway serves as a major gateway to the Forest. The Welcome Station, located along the Cascade Lakes Highway, is easily accessible by vehicle to travelers and central Oregon communities. Currently there is not an option for those visitors and residents wanting to access the Welcome Station and existing Forest trail systems in a non-motorized mode while removed from the Cascade Lakes Highway (i.e. not utilizing the highways shoulder).

Desired Condition

A goal of the Cascade Lakes Scenic Byway Corridor Management and Interpretive Plan is to enhance the outstanding recreational qualities, regional significance to visitors, and enhancement of livability for central Oregon residents accessing public lands through the Byway. The Forest Plan also has a goal to provide additions or modifications to trail systems in order to meet increasing and changing demands in recreation (LRMP 4-2, 4-32). These goals helped generate the project's purpose and need to provide non-motorized paved trail connectivity between the Welcome Station and the City of Bend, developed trailhead parking near Bend and mountain bike trail connections between the Welcome Station and the Wanoga, Deschutes River and Phil's trail systems. This would establish the Welcome Station as a portal to public lands, provide connections between established biking and hiking trail networks, and create an opportunity for multi-modal access and alternative forms of transportation between the city and public lands.

The need for such additions to the National Forest Trail System have been expressed by the Deschutes County Committee on Recreation Assets, Central Oregon Trail Alliance, Deschutes County Bicycle and Pedestrian Advisory Committee, Bend Park and Recreation District, local residents and the neighboring community.

1.6 PROPOSED ACTION

The Deschutes National Forest proposes to provide additional trail connections from the City of Bend, Oregon to the Welcome Station and existing mountain bike trail systems. These additional connections would establish the Welcome Station as a portal to public lands, provide connections between established biking and hiking trail networks, and create an opportunity for multi-modal access and alternative forms of transportation between the city and public lands. A detailed description of the proposed action can be found in Chapter 2.4.2 Alternative 2.

Specific actions include:

Trailhead: Construct a new trailhead to accommodate approximately 20 vehicles on the south side of the Cascade Lakes Highway, approximately 0.5 miles west of Forest boundary with the City of Bend. The parking area would utilize the existing access road to the dispersed parking area that has become known as 'Good Dog!.' The trailhead would serve users of the proposed paved path as well as visitors currently accessing the area for dispersed recreation. It would include graveled parking areas, kiosks with visitor information, interpretive signs, and information.

Trails: Construct approximately 3.4 miles of a non-motorized paved path connecting the Bend Park and Recreation District Haul Road trail to the Welcome Station paralleling the Cascade Lakes Highway.

Provide approximately 4.9 miles of mountain bike trails of moderate difficulty connecting Tyler's Traverse to the Cascade Lakes Highway pedestrian and bicycle undercrossing. This would provide a connection between the Wanoga mountain bike trail system, Seventh Mountain Resort, the Welcome Station, and Phil's trail system.

Construct approximately 6.3 miles of mountain bike trails of easier difficulty level that would connect the Welcome Station, Phil's trail system, and the Cascade Lakes Highway bicycle and pedestrian undercrossing which would provide a connection to the Wanoga mountain bike trail system and Seventh Mountain Resort.

Re-route a section of COD mountain bike trail (0.4 miles) with the newly constructed section taking advantage of natural terrain to maintain the 'more difficult' trail rating. A section of the trail that is currently rated as easier difficulty would be obliterated.

Short sections (1.1 miles) of the COD trail and user created trails would be closed, obliterated and revegetated. This is to eliminate redundant sections of trail that are no longer needed.

1.7 MANAGEMENT DIRECTION

1.7.1 DESCHUTES NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

This environmental assessment is tiered to the Final Environmental Impact Statement (FEIS) for the Deschutes National Forest Land and Resource Management Plan as amended. The Forest Plan guides all management activities on the Forests. It establishes overall goals and objectives, and standards and guidelines for proposed activities, including specific management area guidance for resource planning. Major Forest Plan amendments that pertain to this project are: the Upper Deschutes Wild and Scenic River and State Scenic Waterway Comprehensive Management Plan (UDWSR), Inland Native Fish Strategy (INFISH), and Eastside Screens guides all natural resource management activities within the project area and provides standards and guidelines for the Deschutes National Forest.

Table 1-1: Management Areas and Acres within the Project Area

LRMP Management Allocations	Acres of Management Allocation within the Project Area Boundary
MA1 Special Interest Area	325
MA7 Deer Habitat	6,604
MA8 General Forest	4,155
MA9 Scenic Views	5,425
MA11 Intensive Recreation	1,035
MA15 Old Growth Allocated Areas	186
MA17 Wild and Scenic Rivers	1,844
Other Ownership	699
TOTAL	**20,273***

*Acres vary slightly from project boundary acres due to small differences in the GIS analysis of management areas; this represents an analysis error of less than 0.1%.

The project is at a much smaller scale than the analysis area boundary. The larger analysis area boundary serves to encompass all the trail systems proposed trails could provide connections to. The larger analysis area was established to facilitate recreation and wildlife analysis.

Table 1-1a Miles of trails within management areas for the action alternatives.

LRMP Management Allocations	Miles of Trail within Management Allocations*	
	Alternative 2	Alternative 3
MA7 Deer Habitat	6.9	6.9
MA9 Scenic Views	5.3	3.6
MA11 Intensive Recreation	5	1.9
Other Ownership	0.9	0.9
TOTAL	**18.1**	**13.3**

*Includes miles of trail to be decommissioned

The proposed project is at a much smaller scale than the project area boundary. The larger project area boundary serves to encompass all the trail systems proposed trails could provide connections too. Proposed activities would only occur in three management allocations. Project activities are within the following management areas:

- MA7 Deer Habitat – 6.9 miles of trail construction
- MA9 Scenic Views – 6.2 miles of trail construction and obliteration
- MA11 Intensive Recreation – 5 miles of trail and trailhead construction

MA7 Deer Habitat

The overall goal of deer habitat is to manage vegetation to provide optimum habitat conditions on deer winter and transition ranges while providing some domestic livestock forage, wood products, visual quality and recreation opportunities (LRMP 4-113).

MA9 Scenic Views

The goal of scenic views is to provide Forest visitors with high quality scenery that represents the natural character of central Oregon. The theme of scenic views is for landscapes seen from selected travel routes and use areas to be managed to maintain or enhance the appearance of the areas being viewed (LRMP 4-121).

MA11 Intensive Recreation

The goal is to provide a wide variety of quality outdoor recreation opportunities within a Forest environment where the localized settings may be modified to accommodate large numbers of visitors (LRMP 4-135).

Ryan Ranch Key Elk Area

The project area is also within 6,631 acres (31%) of the Ryan Ranch Key Elk Area (KEA), as designated in the Forest Plan (LRMP 4-56 to 4-58; Appendix 16-2). This includes approximately 10.8 miles of proposed trail within the KEA (Figure 3-5). Elk are found in certain key habitat areas, within which land management is designed to provide conditions needed to support summering and wintering elk. Key elk areas are not a separate management area designation in the Forest Plan but forest-wide standards and guidelines (S&Gs) are identified for these areas (LRMP WL-43, WL-45, WL-46 and WL-47).

Additional management direction can be found in Appendix A of this EA and in resource reports located in the project record.

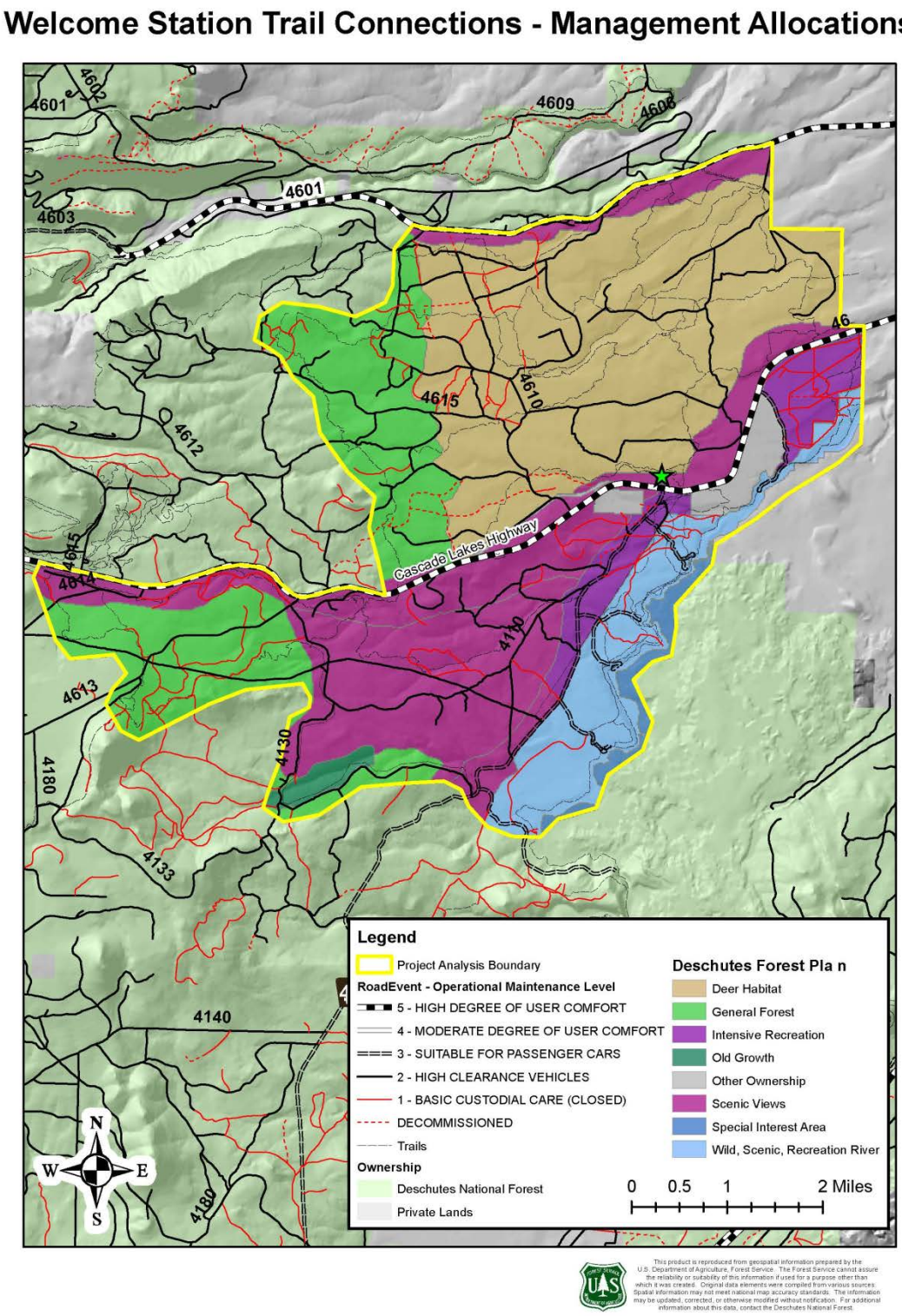

Figure 1-3: LRMP Management Areas in the Project Area

1.7.2 AMENDMENTS TO THE DESCHUTES LAND AND RESOURCE MANAGEMENT PLAN

Inland Native Fish (INFISH) – The riparian management guidelines of the Forest Plan were amended by the Inland Native Fish Strategy (INFISH, 1995). INFISH was intended to be interim direction to protect habitat and populations of resident native fish and to provide for options for management. The INFISH delineated riparian habitat conservation areas (RHCAs) where riparian-dependent resources receive primary emphasis. These RHCAs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems. These areas will be managed to maintain or restore water quality, stream channel integrity and channel processes, sediment regimes, in stream flows, diversity and productivity of plant communities in riparian zones, and riparian and aquatic habitats to foster unique genetic fish stocks that evolved within the specific region. RHCAs run through and are overlaid on other allocations. No activities are proposed within the RHCA of the Deschutes River.

Upper Deschutes Wild and Scenic River and State Scenic Waterway Comprehensive Management Plan – This plan, as signed in 1996, amended the Forest Plan. The 1990 LRMP MA17 provided interim S&Gs for the Upper Deschutes River Corridor until completion of this management plan. The overall goal for this management area is to protect and enhance Outstandingly Remarkable Values, including resources, which are significant elements of those values (Upper Deschutes CMP pg. 27). Outstandingly Remarkable Values (ORVs) for Segment 4 that are to be protected or enhanced by resource management activities are Geologic, Fishery, Vegetation, Wildlife, Cultural, Scenic and Recreation. Proposed activities are not within the river corridor therefore, there is no effect to the ORVs in the corridor and it won't be further discussed for geologic, vegetation, wildlife, cultural values. Fishery, scenic and recreation ORVs are discussed in Chapter 3.

Northwest Forest Plan –The Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl was signed in 1994. Commonly known as the Northwest Forest Plan (NWFP), it provides standards and guidelines for management of lands within the range of the northern spotted owl. There are seven land allocations under the Northwest Forest Plan. Approximately 4,335 acres of the Welcome Station Trails project area falls within two of these allocations: Matrix and Administratively Withdrawn (Figure 1-4). Even though the analysis area is within lands governed by the NWFP, proposed activities are not within NWFP management areas (Figure 1-4).

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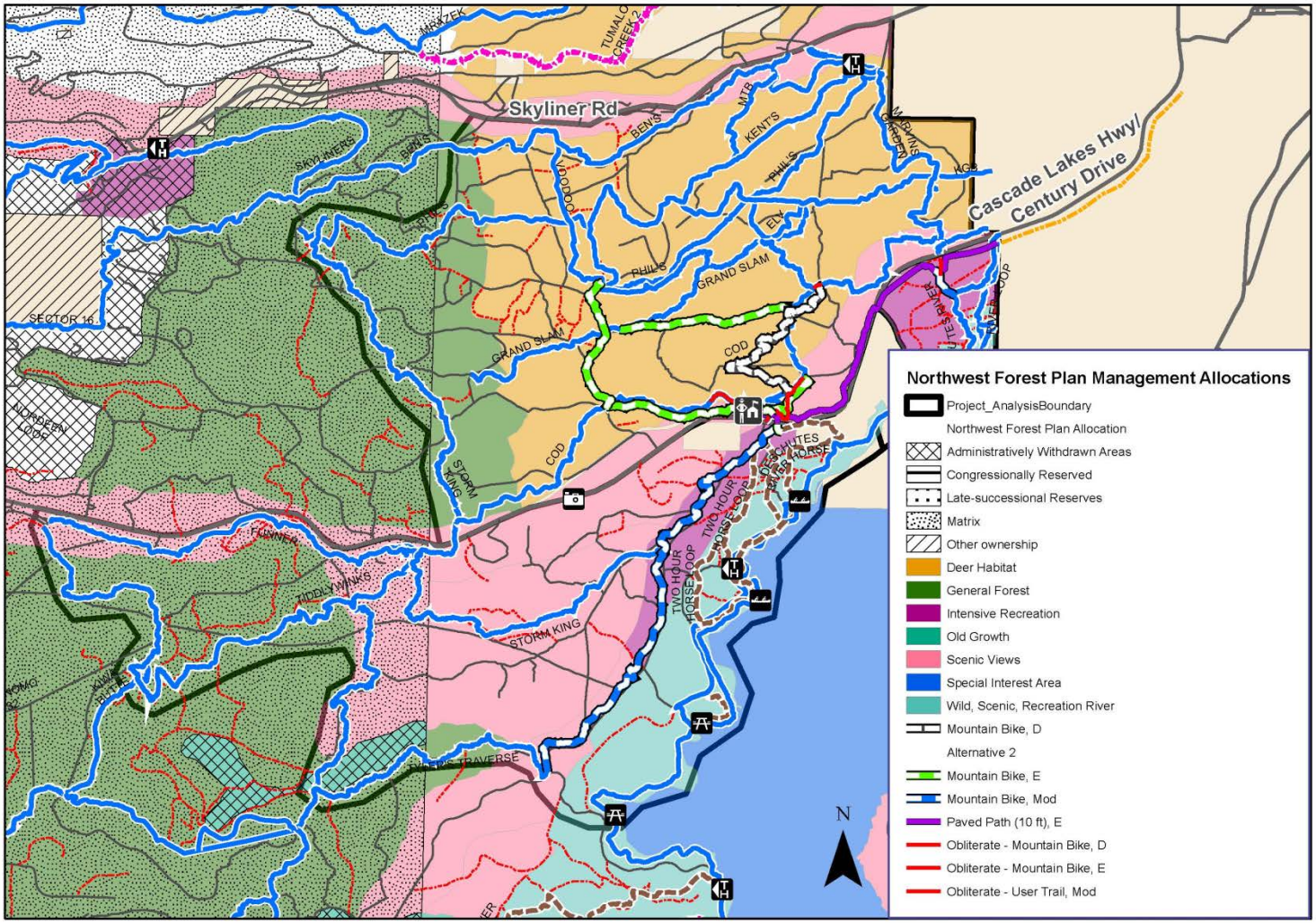

Figure 1-4: Northwest Forest Plan Management Allocations

1.8 SUMMARY OF THE SCOPING PROCESS

The Welcome Station Trail Connections project was first published to the Deschutes and Ochoco National Forest project webpage on 1/31/2013 at: http://data.ecosystem-management.org/nepaweb/nepa_project_exp.php?project=41207

This project was first published in the Deschutes National Schedule of Proposed Actions (SOPA), a quarterly publication, in April 2013 and has appeared in each quarterly SOPA since then. This is a quarterly report that is distributed to interested individuals, organizations, and agencies Forest-wide. The SOPA is automatically updated and available on the Deschutes and Ochoco National Forest webpage at: http://www.fs.fed.us/sopa/forest-level.php?110601.

A detailed description of the proposed action was mailed on February 6, 2013, to approximately 100 forest users and concerned publics, soliciting comments and concerns related to this project. This letter was also mailed to the Burns Paiute Tribe, The Klamath Tribe, and the Confederated Tribes of the Warm Springs. Coordination and consultation with the tribes is ongoing. Approximately 50 letters or emails of response were received, which were considered and evaluated. Discussion of public comments can be found below in Section 1.9 and in Chapter 2.3 Alternatives Considered but Eliminated from Detailed Study.

1.9 ISSUES

The Interdisciplinary (ID) team of Forest Service resource specialists evaluated input from public scoping. All issues raised during the life of this project are addressed in this EA. Issues and concerns are used to formulate and develop alternatives or develop constraints and mitigation measures to reduce or eliminate environmental effects.

Issues are generally divided into the following groups: non-key issues, key issues and analysis issues.

1.9.1 EVALUATION OF NON-KEY ISSUE SCOPING COMMENTS

Comments brought forth from public scoping were evaluated. Some public respondents presented concerns that were considered but were determined to be non-key issues because of a variety of reasons, such as, the issue is outside the scope of this project; is already decided by law, regulation or other higher level decision; is conjectural and not support by scientific or factual evidence; is adequately addressed in alternatives (including project design features and/or mitigation measures). The following table (Table 1-1) summarizes issues brought forth in scoping and provides rationale why this issue has been determined to be a non-key issue.

Table 1-2: Non-Key Issue Summary and Rationale

Issue Number	Issue	Rationale
1	Concerns were raised over access to existing trails during this projects implementation.	Temporary closure of sections of existing trails and of areas used for dispersed recreation off trail may occur for public safety reasons under either action alternative. This issue would be addressed in project design features and in the implementation plan.
2	Some commenters, in light of this economic climate, questions whether funding this project is the best use of dollars.	Funding for this project has been secured by obtaining grant dollars through the National Scenic Byways Program. Grant dollars received are allocated for planning, design and potential construction of trailhead parking with interpretation and the paved trail from Bend to the Welcome Station. Grant dollars received are slated for particular purposes and are not available to the Forest Service to re-purpose for other Forest or public priorities. If approved, this project would initiate multiple construction contracts and employ local contractors and small businesses. COTA has volunteered to assist in the construction of the proposed mountain bike trails and provide long-term maintenance of those trails. Other partnerships would be sought for routine maintenance and for future heave maintenance or reconstruction.
3	Concern was raised over the potential ecological impacts to existing vegetation, especially large trees.	Trailhead and trail locations have been designed to avoid large trees (especially over 21 inches dbh), to the extent possible. This project area overlaps the West Bend Vegetation Management project area. If approved, implementation of the West Bend Vegetation project would thin trees in the overstory and understory allowing trail locations to take advantage of less dense areas.

Issue Number	Issue	Rationale
4	Commenters questioned whether proposed trails would increase human disturbance to wildlife species.	The project area is already highly used by recreationists. The project area provides connections to Phil's trailhead, COD trails, the Wanoga trail system and Deschutes River trails. These areas encompass some of the most popular trails on the Forest for mountain biking, hiking and running. Trail 2a was designed to be within 150 feet of FSR 41 to reduce disturbance impacts to wildlife. Both action alternatives were designed to be consistent with the Forest Plan standards and guidelines for wildlife and to minimize impacts. Alternative 3 was specifically designed to reduce impacts to KEAs. Direct, indirect, and cumulative effects to wildlife species would be address in Chapter 3.4.2, additional information and analysis are in the Wildlife reports located in the project record.
5	A commenter requested that this project evaluate constructing trails that provide off-leash access for dogs.	None of the proposed trails are within areas with existing leash restrictions and this project does not propose any new leash restrictions on trails.
6	Concern was raised over public safety with Trail 1a crossing the Cascade Lakes Scenic Highway.	ODOT determined that the proposed location of Trail 1a crossing is the safest crossing point for the public. This location has the best sight distances for trail users and vehicles, is the shortest crossing distance of potential crossing locations, and minimizes the conflicts with turning movements. ODOT would retain responsibility to monitor and install traffic control devices to maintain a safe crossing. The crossing location would be signed with advance warning signs. ODOT may consider other controls to provide for public safety such as lowering the spped limit and establishing a crosswalk of other measures as needed. Coordination with ODOT would continue in order to install the most effective controls.

1.9.2 ANALYSIS ISSUES

Analysis issues, as used in this EA, were identified as those that do not drive an alternative, or address the purpose and need, and that can be addressed through standards and guidelines, mitigation, analysis needs or monitoring. These items did not result in differing design elements among alternatives but are important for providing the Responsible Official and the public with complete information about the effects of the project.

The following elements were not considered to be key issues but are relevant to the project and tracked through the analysis:

1. Recreation
    a. Recreation Opportunity Spectrum
        i. Access
        ii. Facilities and Site Management, Visitor Impacts and Visitor Management and Information
        iii. Social Encounters
    b. Recreation Activities and Experience
    c. Economics
    d. Land Uses
2. Wildlife
    a. Management Indicator Species
    b. Proposed, Endangered, Threatened, and Sensitive Terrestrial Species
    c. Big Game
    d. Migratory Birds
3. Scenery
4. Proposed, Endangered, Threatened, and Sensitive Plant Species
5. Invasive Plant Species
6. Fisheries, Water Quality, and Riparian Habitat
7. Soil Quality
8. Heritage Resources
9. Transportation System

1.9.3 KEY ISSUES

Key issues are defined as those directly or indirectly caused by implementing the proposed action. Key issues are used to formulate and develop alternatives to the proposed action, prescribe mitigation measures, or analyze and disclose environmental effects. Key indicators are measures used to track the effects of the actions on the issues.

This section consists of two key issues and an issue table providing a crosswalk of why other comments brought forth from public scoping were determined to be non-key issues.

Key Issue 1: Potential Impacts on Key Elk Habitat Area

Elk are found in certain key habitat areas and management will provide conditions needed to support certain numbers of summering and wintering elk. The project area overlaps 6,631 acres of the Ryan Ranch Key Elk Area (KEA). Alternative 2 proposes 10.8 miles of new trail and Alternative 3 proposes 6.04 miles of new trail in the Ryan Ranch KEA. Habitat loss is not a concern because trail locations are kept within approximately 150 feet of existing roads to limit the amount of additional area that is subject to disturbance and to reduce habitat fragmentation. In addition, mountain bike trail

construction would only remove an incremental amount of small diameter trees. Human disturbance to elk from trail use is of concern. The Forest Plan has acknowledged that several KEAs, including Ryan Ranch KEA, are within important recreation areas and has provided measures to minimize conflicts between recreation and wildlife (WL-45, LRMP pg. 4-56). Forest Plan direction specifies road densities within KEAs but does not specifically address non-motorized trails. This key issue would help measure how recreation within the KEA is managed and in evaluating the potential impacts to elk.

Alternative 3 was developed to address this issue by proposing approximately 4.8 fewer trail miles in the KEA by proposing not to construct Trail 2a which parallels FSR 41. The measurement below would be used to display the difference in the alternatives.

Key Indicators:

- Miles of trail within the Key Elk Area (KEA)

Key Issue 2: Providing parking for existing users and new use of the proposed paved trail (Trail 1)

The area proposed for a new trailhead is currently used primarily by Bend residents and visitors to nearby resorts for walking, running and biking. It includes the area locally known as 'Good Dog!' due to its popularity with visitors recreating with dogs and an informal parking area. Based on data collected during the spring and summer of 2013, there are an average of six vehicles parked at the Good Dog! parking area at one time (Table 1-2). During public scoping, several commenters raised concern that 20 spaces at the trailhead would not be sufficient to support existing use and new use of the paved trail, Trail 1. It is anticipated that users of the paved trail would bike, walk, or jog either from the city limits, or use the proposed trailhead as their starting point. Other concerns raised were if the parking lot would provide accessible parking.

The action alternatives address this issue by proposing 40 (Alternative 2) verses 22 (Alternative 3) parking spaces which would be used to display the difference in the alternatives.

Key Indicators:

- Number of parking spaces at the trailhead
- Square footage of parking area
- Number of accessible parking spaces provided

1.10 OTHER PERTINENT LAWS AND REGULATIONS

Analysis and documentation has been done according to direction contained in the National Forest Management Act, the National Environmental Policy Act, the Council on Environmental Quality regulations, Forest Service NEPA regulations, The Endangered Species Act, the National Historic Preservation Act, the Clean Air Act, and the Clean Water Act.

The following is a brief explanation of each of these laws and their relation to the current project planning effort.

1.10.1 NATIONAL FOREST MANAGEMENT ACT OF 1976

The National Forest Management Act (NFMA) directs all actions taken on National Forest System (NFS) lands to be consistent with Land and Resource Management Plans. The regulations in this

subpart set forth a process for developing, adopting, and revising land and resource management plans for NFS lands as required by the Forest and Rangeland Renewable Resource Planning Act of 1974, as amended. These regulations prescribe how land and resource management planning is conducted on NFS lands. The resulting plans shall provide for multiple-use and sustained yield of goods and services from the NFS in a way that maximizes the long-term net public benefits in an environmentally sound manner. This project would incorporate design features that ensure compliance with amended Forest Plan standards and guidelines.

1.10.2 THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969, AS AMENDED

The purposes of this Act are "to declare a national policy which would encourage productive and enjoyable harmony between man and his environment, to promote efforts which would prevent or eliminate damaged to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nations; and to establish a Council on Environmental Quality" (42 U.S.C. Sec. 4321). The law further states "it is the continuing policy of the Federal Government, in cooperation, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic and other requirements of the present and future generations of Americans." This law essentially pertains to public participation, environmental analysis, and documentation.

The Welcome Station Trail Connections project follows the format and content requirements of environmental analysis and documentation. The entire process of preparing this environmental assessment was undertaken to comply with NEPA. Cumulative effects were assessed and displayed where they occur in the manner most informative and logical to display. The depth of analysis was tailored to the degree of effect. Therefore, a brief discussion is most useful to decision makers and the public to reduce paperwork and the accumulation of extraneous background data and to emphasize real environmental issues and alternatives (CEQ, 1500.2b). In many instances within this analysis, past and present activities were included in the existing condition. Foreseeable actions were also addressed if there was a proposed action and if it is in the public domain.

1.10.3 THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED

Effects to Threatened and Endangered species are evaluated in the Wildlife and Botany sections of Chapter 3 of this EA and in their resource reports. The Endangered Species Act of 1973 requires that actions of federal agencies do not jeopardize or adversely modify critical habitat of federally listed species. A Biological Evaluation has been completed for threatened, endangered, and sensitive plant, and terrestrial species.

The purposes of this Act are to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered and threatened species, and to take such steps as may be appropriate to achieve the purpose of the treaties and conventions set forth in subsection (a) of this section". The Act also states, "It is further declared to be the policy of Congress that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act."

Threatened and endangered fish, plant, and wildlife species and their habitat are evaluated in Chapter 3 of this EA, and in the Biological Assessments/Evaluations found in the project record.

1.10.4 MULTIPLE-USE SUSTAINED-YIELD ACT OF 1960

The Multiple-Use Sustained Yield Act of 1960 requires the Forest Service to manage NFS lands for multiple uses (including timber, recreation, fish and wildlife, range, and watershed). All renewable resources are to be managed in such a way that they are available for future generations.

1.10.5 THE NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED

The National Historic Preservation Act (NHPA) requires Federal agencies to consult with American Indian Tribes, State, and local groups. Section 106 of this Act requires Federal agencies to review the effects project proposals may have on the cultural resources in the analysis area.

Potentially affected Tribes (Burns Paiute, The Klamath Tribe, and the Confederated Tribes of the Warm Springs) have been contacted. The State Historic Preservation Officer (SHPO) has been consulted on this project.

1.10.6 THE MIGRATORY BIRD TREATY ACT AND EXECUTIVE ORDER 13186

The Migratory Bird Treaty Act of 1918
The purpose of this Act is to establish an international framework for the protection and conservation of migratory birds. The Act makes it illegal, unless permitted by regulations, to "pursue, hunt, take, capture, deliver for shipment, ship, cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, including in this Convention…for the protection of migratory birds…or any part, nest, or egg of any such bird" (16USC 703). The original 1918 statute implemented the 1916 Convention between the United States and Great Britain (for Canada). Later amendments implemented treaties between the Unites States and Mexico, Japan, and the Soviet Union (now Russia).

In compliance with the Migratory Bird Treaty Act, the Deschutes National Forest is currently following guidelines from the "Conservation Strategy for Landbirds of the East-Slope of the Cascade Mountains in Oregon and Washington" (Altman 2000). This conservation strategy addresses key habitat types as well as biological objectives and conservation strategies for these habitat types found in the East Slope of the Cascades, and the focal species associated with these habitats. The conservation strategy lists priority habitats: 1) ponderosa pine; 2) mixed conifer (late successional); 3) oak-pine woodland; and 4) unique habitats, lodgepole pine, white bark pine, meadows, aspen, and subalpine fir.

Responsibilities of Federal Agencies to Protect Migratory Birds
Executive Order 13186, signed January 10, 2001, directs federal agencies to protect migratory birds by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practical, adverse impacts on migratory birds' resources when conducting agency actions. This order directs agencies to further comply with the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and other pertinent statutes. This analysis is compliant with the National Memorandum of Understanding between the USDA Forest Service and the U.S. FWS to promote the conservation of migratory birds (USDA 2008g). See Wildlife analysis in Chapter 3.4.2.

1.10.7 EXECUTIVE ORDER ON INVASIVE SPECIES

This order (signed February 3, 1999) requires Federal agencies whose actions may affect the status of invasive species to identify those actions and within budgetary limits, "(i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species… (iii) monitor invasive species populations… (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded;…(vi) promote public education on invasive species… and (3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species… unless, pursuant to guidelines that it has prescribed, the agency had determined and made public… that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm would be taken in conjunction with the actions."

1.10.8 The Clean Air Act, as amended in 1977 and 1990

The Clean Air Act requires the Forest Service to protect air quality related values in Class I Areas (e.g. City of Bend). The primary purpose of this act is to: a) protect human health and welfare with national air quality standards; b) establishes major air quality goals; and c) provides means and measures to attain goals by addressing existing and potential air pollution problems. All Forest Service proposed activities must follow the federal Clean Air Act, as amended. The Environmental Protection Agency (EPA) has the responsibility and authority to establish regulations and standards for carrying out the provisions of the Act. Region 10 of EPA covers Oregon, Washington, and Idaho.

1.11 Project Record

This EA hereby incorporates by reference the project record (40 CFR 1502.21). The project record references all scientific information that was considered for the analysis, including reports, literature reviews, review citations, academic peer reviews, science consistency reviews, and results of ground-based observations to validate best available science. Chapter 3 provides a summary of the specialist reports, biological assessments, and biological evaluations in adequate detail to support the decision rationale. The project record is available for review at the Bend-Fort Rock Ranger District Office, 63095 Deschutes Market Road, Bend, Oregon 97701, Monday through Friday 7:45 a.m. to 4:30 p.m.

1.12 Decision to be Made

The responsible official for deciding the type and extent of management activities in the Welcome Station Trails analysis area is the District Ranger of the Bend-Fort Rock Ranger District on the Deschutes National Forest. The responsible official can decide on several courses of action ranging from no action, to selecting one of many possible combinations in the project area. The responsible official will consider the following factors when making a decision:

1. How well the alternative(s) meets the project's purpose and need.

2. How well does the alternative respond to the issue(s).

3. Have public comments been considered during this analysis.

4. What are the likely environmental effects of the proposed action and alternative(s), and have mitigation measures that would apply to project implementation been identified.

CHAPTER 2 – ALTERNATIVES, INCLUDING THE PROPOSED ACTION

CHANGES BETWEEN THE 30-DAY EA AND FINAL EA

There was a miscommunication over trail construction distance from existing roads. The EA first stated that trails would be within approximately 100 feet of roads when it should have been within approximately 150 feet of roads. Wildlife resource biologist confirmed that there are no quantifiable differences in effects between 100 and 150 feet from roads.

Based on public feedback two alternatives, one to consider constructing a second underpass or overpasss to eliminate the surface crossing and the other to construct several smaller trailhead parking areas were considered but eliminated from detailed study for the reasons listed in Section 2.3.6 and 2.3.7.

Resource protection measures for cultural was updated in Section 2.6.1 and a recreation monitoring component to monitor if human waste becomes an issue that warrants a need for a toilet facility at the trailhead was added in Section 2.6.2.

2.1 INTRODUCTION

This chapter describes and compares the alternatives considered for the Welcome Station Trails project. This chapter is intended to present the alternatives in comparative form, sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14).

2.2 ALTERNATIVE DEVELOPMENT PROCESS

An Interdisciplinary (ID) team evaluated information from public scoping. Of the concerns raised, the ID team identified two key issues which resulted in the development of Alternative 3.

This chapter outlines project design elements that have been built into the alternative to ensure compliance with Forest Plan standards and guidelines, laws, regulations and other policies. It also includes resource protection measures that are designed to minimize potential resource impacts by the project.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

The following alternative options were considered during the development of this analysis but were eliminated from detailed study as described below.

2.3.1 ALTERNATIVE A – DO NOT PAVE TRAIL 1

An alternative which would construct the path (Trail 1) without an asphalt surface was considered; however, this alternative was not analyzed further because a surfaced path best meets the project's design criteria for a Class 5 trail (American Association of State Highway and Transportation Officials design guidelines and Forest Service Designed Use and Trail Class Standards) and incorporate universal design standards (FS Trail Accessibility Guidelines) (Ch. 2.4). A paved surface is important for this shared multi-use path (Trail 1) that would be constructed to meet Forest Service Trail Class 5

standards for fully developed trails (Appendix B) which requires a surface that is firm and stable and is commonly hardened with asphalt or other imported material. Hard, all-weather pavement surfaces are generally preferred for multi-modal trails over those of crushed aggregate, sand, clay or stabilized earth. On unpaved surfaces, wheelchair users, bicyclists and other wheeled users must use a greater effort to travel at a given speed when compared to a paved surface. Users lose traction more easily on unpaved surfaces and more maintenance is needed to ensure compliance with accessibility requirements. It is important to construct and maintain a smooth riding surface on multi-use paths.

2.3.2 Alternative B – Reroute Trail 1 to the southeast side of the Cascade Lakes Highway and use the underpass as the highway crossing

Constructing the western portion of the paved path (Trail 1a) on the southeast side of the Cascade Lakes Highway within ODOTs right-of-way across Widgi Creek Golf Course and the Seventh Mountain Resort was explored.

This alternative would provide a connection from the Bend Park and Recreation Haul Road trail to the Cascade Lakes Highway hiker/pedestrian underpass without a surface crossing of the Cascade Lakes Highway.

This alternative was reviewed by Forest Service and Oregon Department of Transportation (ODOT) engineers. Because the path would have closely paralleled the Cascade Lakes Highway, they found that safety barriers would be needed between the paved path and the highway to protect bicyclists and pedestrians from motor vehicle accidents. The location of the path would require the removal of vegetation screening along the golf course that is maintained to protect motorists from stray golf balls. Removing this screening would also place bicyclists and pedestrians at risk of being injured by stray golf balls unless netting or other some other barrier was placed between the golf course and the paved trail. Finally, it was determined that the path would not fit completely within the ODOT right of way, and an easement would need to be pursued across private land. Acquiring easements can be a lengthy process, taking two or more years and due to the safety concerns listed above, it is unlikely that an easement could be attained.

Due to the complexity of the safety requirements for bicyclists, pedestrians and motorists, and the uncertainty of obtaining an easement, this alternative was eliminated from detailed study.

2.3.3 Alternative C – Reroute Trail 1 to the Northeast side of the Cascade Lakes Highway and use the underpass as the highway crossing

Constructing the eastern portion of the paved path (Trail 1a) on the northeast side of the Cascade Lakes Highway in order to avoid the surface crossing of the Cascade Lakes Highway was also explored. In order to meet the purpose and need of this project to provide non-motorized paved trail connectivity between the Cascade Lakes Scenic Byway Welcome Station and the City of Bend, the paved path would ideally connect into the Bend Park and Recreation trail system.

Forest Service, City of Bend, Bend Park and Recreation, and Oregon Department of Transportation engineers discussed alternatives for a trail connection. Much of the area northeast of Century Drive is private land and would require a City or Bend Park and Recreation easement for a trail. Bend Park and Recreation has already secured an easement and has a trail (the Haul Road trail) southeast of Century Drive, making a connection into this existing trail the best option. Therefore, if the trail on national

forest system lands were located northeast of Cascade Lakes Highway, a surface crossing would be required.

With the timeline for a future roundabout at the Tetherow uncertain, there was no good location for a surface crossing within the Bend city limits. The engineers determined that the safest and most feasible surface crossing would be on national forest lands.

2.3.4 Alternative D – Extend Trail 2A to connect with Benham Falls and Benham Butte area to provide trail uses from Sunriver an alternative to the Deschutes River trail

The purpose of this project is to provide non-motorized paved trail connectivity between the Cascade Lakes Scenic Byway Welcome Station and the City of Bend and create mountain bike trail connections between the Welcome Station and the Wanoga, Deschutes River and Phil's trail systems. While trail connections between the community of Sunriver and the existing trail systems may be an important community trail connection, it is outside of the scope of this project.

2.3.5 Alternative E – Narrow Trail 1 to less than 10 feet wide

A comment suggested instead of paving Trail 1 at a width of 10 feet to reduce the width to eight feet or less. This alternative was considered but eliminated from detailed study because the American Association of State Highway and Transportation Officials (AASHTO) recommends "under most conditions that a two-directional shared use path is ten feet wide. In rare instances, a reduced width of eight feet can be adequate. This reduced width should be used only where the following conditions prevail: (1) bicycle traffic is expected to be low, even on peak days or during peak hours, (2) pedestrian use of the facility is not expected to be more than occasional, (3) there would be good horizontal and vertical alignment providing safe and frequent passing opportunities, and (4) during normal maintenance activities the path would not be subjected to maintenance vehicle loading conditions that would cause pavement edge damage. Under certain conditions it may be necessary or desirable to increase the width of a shared use path to 12 feet, or even 14 feet, due to substantial use by bicycles, joggers, skaters and pedestrians, use by large maintenance vehicles, and/or steep grades."

Potential use levels of Trail 1 is assumed to range from moderate to high, depending on the season, this assumption is based on existing use in the area. It has been decided that a ten-foot wide path would provide for user comfort and safety for a combination of users who may encounter each other while utilizing mobility devices, strollers, bikes or bikes with baby trailers.

2.3.6 Alternative F – Construct a second underpass or an overpass to eliminate the need for a surface crossing

Comments suggested that either a second undercrossing or an over crossing east of Widgi Creek Golf Course would eliminate the need for a surface crossing.

To meet the purpose and need, to provide non-motorized paved trail connectivity between the Welcome Station and the City of Bend, the paved path would connect into the Bend Park and Recreation Haul Road Trail which parallels the south side of Cascade Lakes Highway. Due to the location of the privately owned Widgi Creek Golf Course, the path would need to cross Cascade Lakes Highway east of the golf course (see Alternative B). While a pedestrian undercrossing or overcrossing would eliminate the need for a surface crossing, ODOT was able to locate a safe location for a surface crossing, eliminating the need in the foreseeable future for a high cost underpass or overpass. ODOT

would retain responsibility to monitor and install traffic control devices to maintain a safe surface crossing. The crossing location would be signed with advance warning signs. ODOT may consider other controls to provide for public safety such as lowering the speed limit and establishing a crosswalk as needed. Coordination with ODOT would continue to install the most effective controls (Ch. 2.6.1).

2.3.7 Alternative G – Construct several smaller trailhead parking areas in the Entrada area instead of one new trailhead

A commenter suggested that constructing several smaller trailheads in the Entrada area would disperse recreation use, reduce the potential for user conflict and better serve users of the Entrada area. Currently, the public informally parks along the road and at the location of two gates along the Meadow Day Use road to access the Entrada area. Meadow Day Use is the primary developed recreation parking area for users of the area. The proposed location of the paved path (Alternatives 2 and 3) would eliminate an area currently used as a dispersed parking area accessing the Entrada area at the gate near the Meadow Day Use road turnoff that generally accommodates two to three vehicles. This dispersed parking area is located approximated 0.5 miles from the parking area proposed in Alternatives 2 and 3. An option proposed by the commenter was to construct a trailhead accommodating 20 vehicles at the proposed trailhead area, a parking area accommodating 10 vehicles at the Meadow Day Use road turnoff, and a parking area accommodating 10 vehicles adjacent to the Forest boundary (near Entrada Lodge).

The purpose and need for this project is to provide non-motorized paved trail connectivity between the Welcome Station and the City of Bend, developed trailhead parking near Bend and mountain bike trail connections between the Welcome Station and the Wanoga, Deschutes River and Phil's trail systems. The development of new parking areas would serve these developed trail systems. With a trailhead planned for construction adjacent to the Welcome Station, the best location for an additional trailhead to access the paved path and the existing trail system is near the Forest boundary. To meet Forest Plan standard and guidelines for scenery along the Scenic Byway, the number of parking areas are minimized and they must be screened from view from the highway. One location that meets these visual standards is the existing dispersed parking area accessing the Deschutes River trails and the area known and Good Dog!. The Forest has the opportunity to both accommodate parking for new users of the paved path and provide a safe parking area for existing users accessing the developed national forest system trails and the Good Dog! area by placing the trailhead in this location. Based on data collected during the spring and summer of 2013, there are an average of six vehicles parked at the Good Dog! parking area at one time with a maximum 19 vehicles observed at one time (Table 3-3).

The terrain and vegetation at the location suggested by the commenter at the Forest boundary would not provide the screening required to meet the standard and guidelines for developments along the Scenic Byway.

Providing parking for existing users and new use of Trail 1 was evaluated as a key issue. During scoping, comments raised concern that the proposed trailhead parking of 20 spaces was not sufficient to support existing and new use. As a result, Alternative 2 was modified to propose 40 spaces. Alternative 3 analyzed the effects of constructing a parking area in the proposed location with a parking capacity of 22 vehicles. It was determined that, given the existing use of the area and the anticipated use of the paved path, it is likely that use would exceed the designed capacity of the trailhead.

Constructing the trailhead parking with capacity of 40 vehicles in the site proposed in Alternatives 2 would safely accommodating the existing users of the dispersed parking area and the new users of the paved path, maintain scenic quality along the Byway and best meet the purpose and need for the project.

2.4 ALTERNATIVES CONSIDERED IN DETAIL

This EA assesses the potential effects of three alternatives: a No Action Alternative (Alternative 1) and two Action Alternatives (Alternative 2 and Alternative 3).

2.4.1 ALTERNATIVE 1 – NO ACTION

The interpretation of this no action alternative is that the proposed action would not take place. Under this alternative, a non-motorized paved path and trailhead between Bend and the Cascade Lakes Scenic Byway Welcome Station (Welcome Station) would not be constructed along with key mountain bike trails connecting the Welcome Station to the Wanoga and Phil's trails systems. This alternative serves as a baseline from which the interdisciplinary team can evaluate the proposed action.

2.4.2 ALTERNATIVE 2

During the alternative development process, including further field reconnaissance and input from public scoping the proposed action was slightly modified to address the key issue of providing enough parking at the trailhead for existing use and new use of Trail 1a. Originally, it was proposed to provide 20 parking spaces at the trailhead, Alternative 2 proposes providing up to 40 parking spaces with the possibility of a restroom facility. This modification still meets the project's purpose and need.

Alternative 2 would allow for construction of a paved non-motorized path, designated single-track mountain bike trails, and a trailhead facility on National Forest System lands adjacent to and around Cascade Lakes Scenic Byway Welcome Station. This project would establish the Welcome Station as a portal to public lands, provide connections between established biking and hiking trail networks, and create an opportunity for multi-modal access and alternative forms of transportation between the city and public lands.

Specifically, this project includes:

Trailhead Construction

A new trailhead to accommodate approximately 40 vehicles including two accessible spaces would be constructed on the south side of Cascade Lakes Highway, approximately 0.5 miles west of Forest boundary with the City of Bend. The parking area would utilize the existing access road to the dispersed parking area that that has become known as 'Good Dog!' also referred to as the Entrada area. The area's trees and a natural depression would help screen the trailhead from the Scenic Byway. The trailhead would serve users of the proposed paved path as well as visitors currently accessing the area for dispersed recreation. It would include graveled parking areas, kiosks with visitor information, and interpretive signs and information. Intended development of the trailhead would not include a restroom facility but the design and evaluation of effects has included a potential restroom that may be installed in the future if user demands or resource concerns require the additional facility. Development of this trailhead and interpretation of the 1990 Awbrey Burn is identified as the second priority for enhancement and development in the Cascade Lakes Scenic Byway Corridor Management Plan (behind development of the Welcome Station).

Trail Construction

Trail 1 - Paved Path (3.4 miles)

The path would connect the Bend Park and Recreation District Haul Road trail to the Welcome Station paralleling the Cascade Lakes Highway. The proposed non-motorized paved path would be 10 feet wide with approximately 2 or 2.5 foot shoulders on each side. Vegetation clearing limits for the path would be less than 20 feet. Final design of this trail may include one to two turnouts to allow visitors a place to rest. The path would be closed to motorized uses other than wheelchairs and mobility devices[1].

Segment 1a (3.3 miles): Connects the Haul Road trail to the Welcome Station. Approximately 2 miles of the path would be located on an existing road that has previously been closed to public motor vehicle access.

A surface crossing of Cascade Lakes Highway would be located west of the intersection with the Meadow day use access road.

Segment 1b (0.1 miles): Connects the paved path north of Cascade Lakes Highway through the Cascade Lakes bicycle and pedestrian underpass (located east of the intersection with FSR 41). Construction of the paved path accessing the underpass would require some excavation. Proposed mountain bike trails (2a and 2b) would provide connections to the Seventh Mountain Resort and the Wanoga mountain bike trail system.

Trail 2 – Wanoga Trail System Mountain Bike Trail Connections (4.9 miles)

The trail would connect Tyler's Traverse and Storm King mountain bike trails to the Cascade Lakes Highway bicycle and pedestrian undercrossing and would provide a connection between the Wanoga mountain bike trail system, Seventh Mountain Resort, the Welcome Station, and Phil's trail system. These segments of single-track mountain bike trail would be of easier to moderate difficulty.

Segment 2a (4.8 miles): Parallels the northwest side of FSR 41 from Tyler's Traverse mountain bike trail (across from the Slough Day Use access road) and connects into the paved path near the bicycle and pedestrian underpass.

Surface crossing of FSR 41 would be located near the intersection with the Lava Island access road (FSR 4100800).

Segment 2b (0.1 miles): Connects the bicycle and pedestrian underpass to the road currently used by Seventh Mountain Resort customers to access the Forest. The existing undercrossing is an open scar on the land. Enhancement of the undercrossing would occur using plantings, terracing, and earth berms. Native vegetation would provide screening from the Cascade Lakes Highway. Site revegetation and constructing of terrace planting areas with finished grades would prevent erosion and hazardous drainage problems that may result in long-term maintenance issues for the paved path.

[1] A wheelchair or mobility device, including one that is battery-powered, is a device that is designed solely for use by a mobility-impaired person for locomotion and that is suitable for use in an indoor pedestrian area (Title V, sec. 507c, of the ADA; 36 CFR 212.1). "Designed solely for use by a mobility-impaired person for locomotion" means that the wheelchair was designed and manufactured solely for use for mobility by a person with a disability. Thus, this term does not include a motorized unit that has been retrofitted to make it usable by a person with a disability. "Suitable for use in an indoor pedestrian area" means usable inside a home, mall, courthouse, or other indoor pedestrian area.

Trail 3 – Phil's Trail System Mountain Bike Trail Connections (5.5 miles)

The trails would connect the Welcome Station, Phil's trail system, and the Cascade Lakes Highway bicycle and pedestrian undercrossing, which would provide a connection to the Wanoga mountain bike trail system and Seventh Mountain Resort. These segments of single-track mountain bike trail would be of easier difficulty.

Segments 3a, 3b and 3c: Creates a loop trail from the Welcome Station and connects into the Phil's trail system. Approximately 0.7 miles of the trail would be located on an existing closed road.

Trail 4 – COD Trail Re-route (1.8 miles)

A section of COD mountain bike trail would be re-routed with the newly constructed section taking advantage of natural terrain to maintain the 'more difficult' trail rating. A section of the trail that is currently rated as easier difficulty (5c) would be obliterated.

Trail 5 – Trail Obliteration and Rehab (1.1 mile)

Segment 5a (0.1 miles): A short section of trail that currently connects COD trail to a surface crossing of Cascade Lakes Highway near FSR 41 would be closed, obliterated and revegetated. Bike traffic would be directed onto the paved path through the bicycle and pedestrian undercrossing to connect to proposed mountain bike trails (2a and 2b) which would provide connections to the Seventh Mountain Resort and the Wanoga mountain bike trail system.

Segment 5b (0.6 miles): A section of the existing COD trail would be obliterated. This section parallels the existing ODP trail and is redundant.

Segment 5c (0.4 miles): Re-routes a section of COD mountain bike trail that is currently rated as easier difficulty. A new section of COD trail would be constructed to take advantage of natural terrain in order to maintain a difficult trail rating (trail 4).

Trail 6 – Connection from the Trailhead to the Deschutes River Trails (0.3 mile)

The trail would connect from the trailhead to the Deschutes River trails. The single track mountain bike trail would be of easier to moderate difficulty and use existing user-created trails and closed roads.

Construction Specifics

Short-term safety hazards, such as construction traffic and falling trees near roads, would be mitigated through contract safety provisions and are not anticipated to impact public safety. Standing trees that lean over or near roadways and present a hazard to public safety due to conditions such as deterioration or physical damage to roots, trunks, stems, or limbs would be removed from the project area.

Trailhead

Parking pods at the trailhead were designed to avoid large trees (greater than 21 inches dbh) and to utilize as much of the existing vegetation as possible to provide screening from the Cascade Lakes Highway and shade for users.

Paved Path

To construct the paved path it has been estimated that fewer than 100 trees between 8 and 15 inches dbh and less than 25 trees between 16 and 20 inches dbh would be removed. No snags or green trees over 21 inches dbh are identified for removal.

Mountain Bike Trails

Trail placement for mountain bike trails is expected to avoid trees over 6 inches dbh and clumps of smaller diameter trees. Because of the smaller width of mountain bike trails many trees can be avoided; therefore no estimate on tree removal was made. Trail construction would be 24 to 48 inches wide with vegetation clearance limits of less than 6 feet. The max width for the majority of trails is not predicted to be over 24 inches but depending on sight, distances and terrain up to 48 inches may be needed.

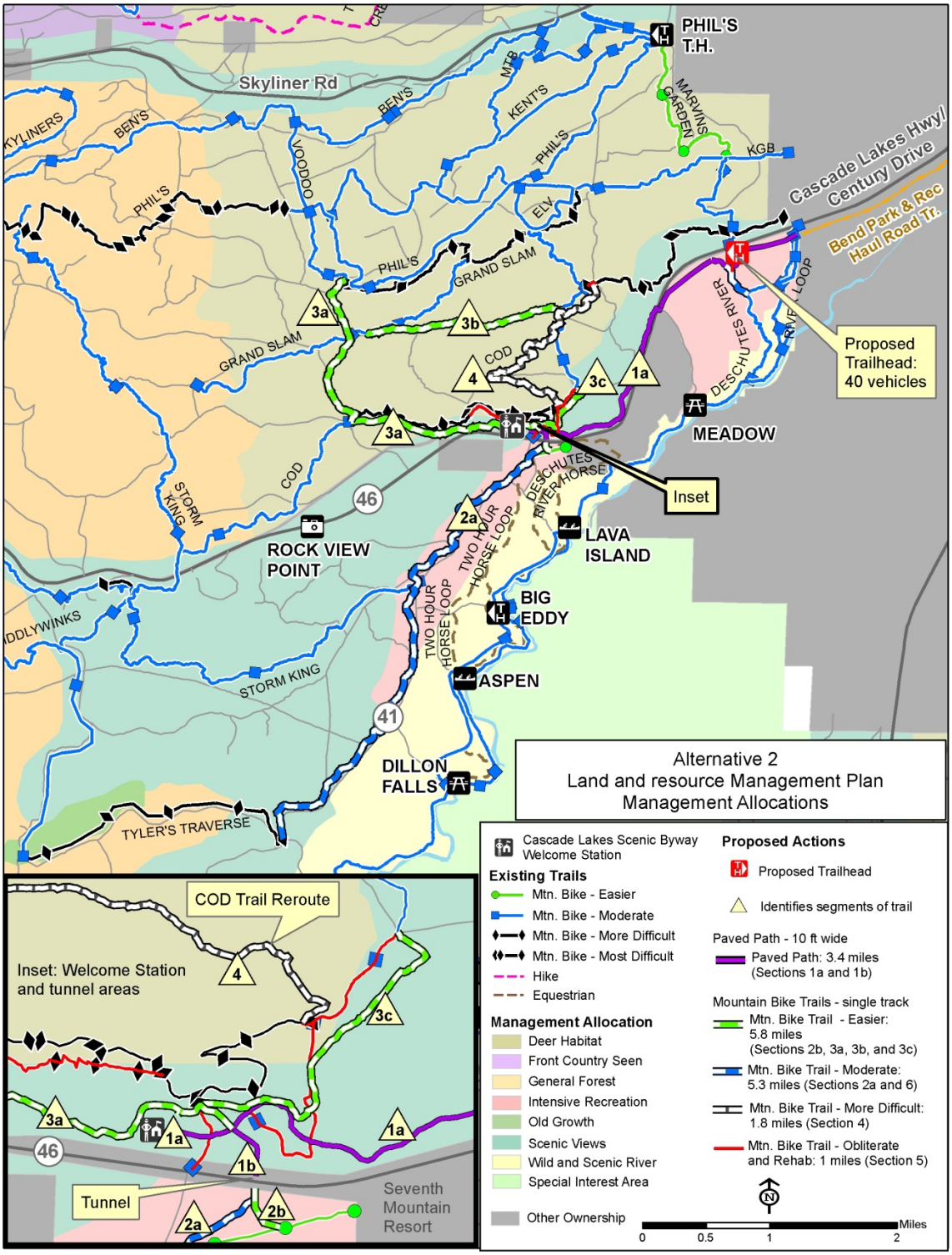

Figure 2-1: Welcome Station Trails Alternative 2

2.4.3 ALTERNATIVE 3

Alternative 3 has all the same components of Alternative 2 except the following:

Trailhead Construction

The trailhead would be constructed in the same location as proposed in Alternative 2, it would instead accommodate approximately 22 vehicles including two accessible spaces. The parking area would utilize the existing access road to the dispersed parking area that that has become known as 'Good Dog!' also referred to as the Entrada area. The area's trees and a natural depression would help screen the trailhead from the Scenic Byway. The trailhead would serve users of the proposed paved path as well as visitors currently accessing the area for dispersed recreation. It would include graveled parking areas, kiosks with visitor information, and interpretive signs and information. Development of this trailhead and interpretation of the 1990 Awbrey Burn is identified as the second priority for enhancement and development in the Cascade Lakes Scenic Byway Corridor Management Plan (behind development of the Welcome Station).

Trail 2a

Trail 2a (4.8 miles), paralleling the northwest side of FSR 41 from planned Tyler's Traverse mountain bike trail (across from the Slough Day Use access road) and connecting into the paved path near the bicycle and pedestrian underpass would not be constructed in order to address the key issue of potential impacts on key elk habitat.

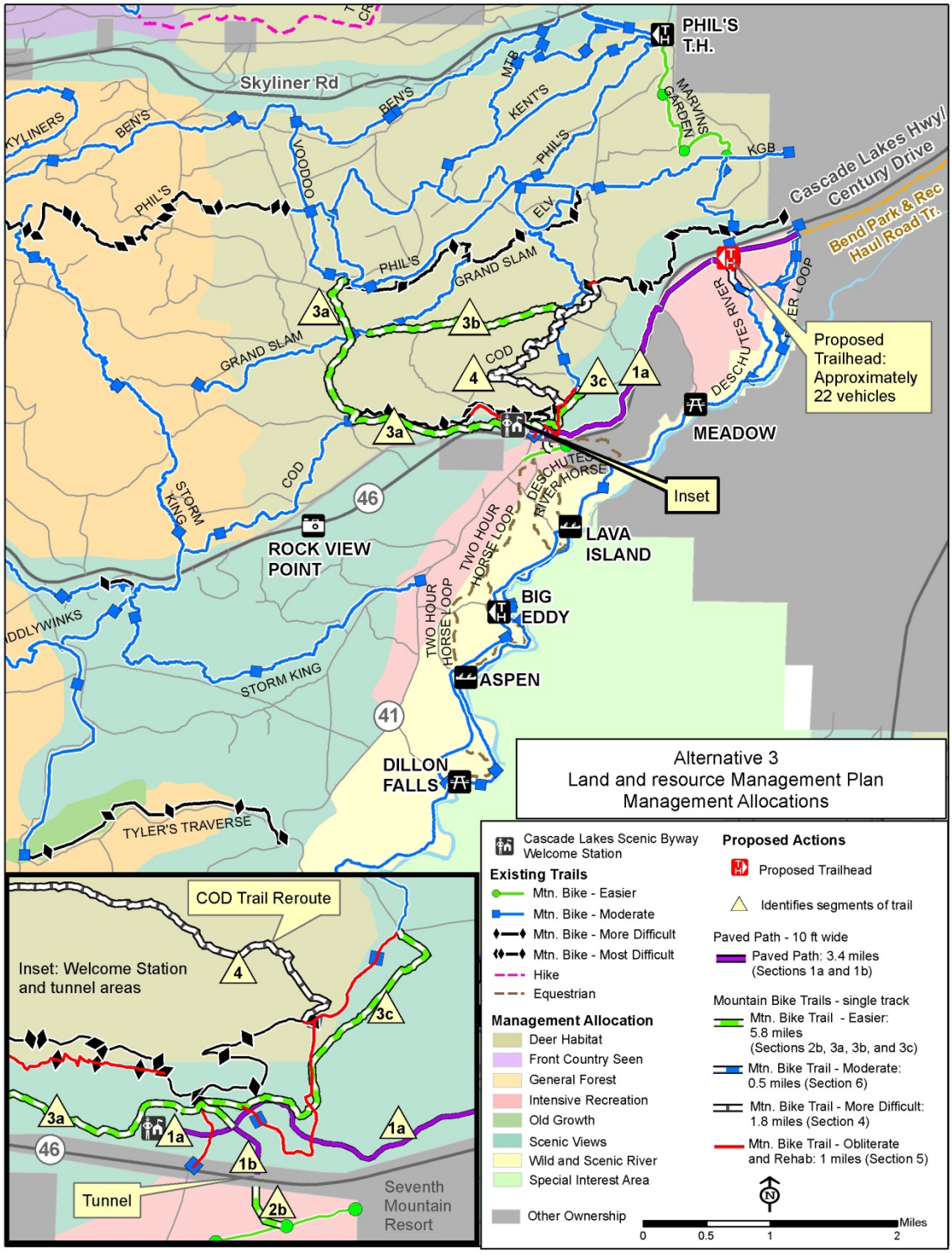

Figure 2-2: Welcome Station Trails Alternative 3

2.5 COMPARISONS OF ALTERNATIVES

The following table compares each alternative, Alternative 1 No Action with Alternative 2 and Alternative 3, to one another.

Table 2-1: Comparison of Alternative 1, Alternative 2, and Alternative 3

Alternative Elements		Alternative 1	Alternative 2		Alternative 3	
Paved Trail (Trail 1) Characteristics	Path Width (feet)	0	10		10	
	Grave Shoulder (feet)	0	2.5		2.5	
	Max Clearing Limits (feet)	0	20		20	
	Path Length (miles)	0	3.4		3.4	
Mountain Bike Trail Construction (miles)	Trail 2a Moderate Difficulty	0	4.8	4.9 total	0	0.1 total
	Trail 2b Easier Difficulty	0	0.1		0.1	
	Trail 3a Easy Difficulty	0	3.1	5.5 total	3.1	5.5 total
	Trail 3b Easy Difficulty	0	1.7		1.7	
	Trail 3c Easy Difficulty	0	0.7		0.7	
	Trail 4 Difficult	0	1.8		1.8	
	Trail 6 Moderate Difficulty	0	0.3		0.3	
Mountain Bike Trail Characteristics	Max Trail Width (feet)	0	4		4	
	Max Clearing Limits (feet)	0	6		6	
Mountain Bike Trail Obliteration (miles)	Trail 5	0	1.1		1.1	
Trailhead Construction	Number of Parking Spaces	Undefined Parking Maximum of 19	40		22	
	Accessible Parking Spaces	0	2		2	
	Parking Area (square feet)	11,325	30,000		15,000	
	Number of Restrooms	0	1		0	

Trail specifics for Alternative 2. The difference between Alternative 2 and Alternative 3 is that 4.8 miles of Trail 2a would not be constructed. Total miles of trail to be constructed or obliterated for Alternative 2 is 18.1 miles and Alternative 3 is 13.3 miles.

Table 2-2: Trail specifics for Alternative 2. Note that Alternative 3 is the exact same except Trail 2a would not be constructed

Trail Section	Miles	Designed Use and Difficulty Rating	Maximum Clearing Limits (feet)	Maximum Trail Width (feet)	Section Description
Trail 1a	0.5	Paved Path Easy Difficulty	20	10	Trail section begins at the city limits to the trailhead and would be located on an existing closed road.
	0.4	Paved Path Easy Difficulty	20	10	New trail construction to avoid crossing the trailhead access road.
	0.6	Paved Path Easy Difficulty	20	10	From the trailhead to FSR 4600100 and would be located on an existing closed road.
	1.8	Paved Path Easy Difficulty	20	10	Trail continues on the NW side of Cascade Lakes Highway (FSR 46) to connecting to the Welcome Station. This would be new trail construction within 150 feet of an existing open road.
Trail 1b	0.1	Paved Path Easy Difficulty	20	10	New trail construction providing a connection through the tunnel undercrossing to connect to Trail 2a and 2b.
Total	**3.4**				
Trail 2a	4.8	Mountain Bike Moderate Difficulty	6	4	From Tyler's Travers to the tunnel undercrossing. This trail would be new construction paralleling FSR 41. Trail would be within 150 feet of the road.
Trail 2b	0.1	Mountain Bike Easy Difficulty	6	4	Located from the tunnel undercrossing connecting to the 7th Mountain Inn. This trail would be new construction connecting to the existing 7th Mountain Inn access road.
Total	**4.9**				

Trail Section	Miles	Designed Use and Difficulty Rating	Maximum Clearing Limits (feet)	Maximum Trail Width (feet)	Section Description
Trail 3a	0.6	Mountain Bike Easy Difficulty	6	4	Begins at the Welcome Station and makes a clockwise loop. New trail construction.
	1	Mountain Bike Easy Difficulty	6	4	Begins at the Welcome Station and makes a clockwise loop. This section is located on an existing closed road.
	1.5	Mountain Bike Easy Difficulty	6	4	Begins at the Welcome Station, makes a clockwise loop and includes a connection to the Voodoo trail. New trail construction, paralleling FSR 4601.
Trail 3b	1.7	Mountain Bike Easy Difficulty	6	4	Begins at the Welcome Station, makes a clockwise loop. New trail construction, paralleling FSR 4601.
Trail 3c	0.6	Mountain Bike Easy Difficulty	6	4	Begins at the Welcome Station, makes a clockwise loop. New trail construction, rerouting trail to an easier alignment.
	0.1	Mountain Bike Easy Difficulty	6	4	Begins at the Welcome Station, makes a clockwise loop. New trail construction.
TOTAL	**5.5**				
Trail 4	2.4	Mountain Bike Difficult	6	4	Relocate the existing trail to provide a new COD reroute that maintains the more difficult rating.
Total	**2.4**				
Trail 5	0.7	Mountain Bike Easy Difficulty	6	4	Obliterate existing trail.
	0.7	Mountain Bike Difficult	6	4	Obliterate existing trail.
	0.2	User Created	6	4	Obliterate existing trail.
Total	**1.6**				

Trail Section	Miles	Designed Use and Difficulty Rating	Maximum Clearing Limits (feet)	Maximum Trail Width (feet)	Section Description
Trail 6	0.1	Mountain Bike Moderate Difficulty	6	4	New trail construction beginning at the trailhead and connecting to the Deschutes River trails.
	0.2	Mountain Bike Moderate Difficulty	6	4	New trail construction beginning at the trailhead and connecting to the Deschutes River trails. This section would utilize existing user-created trails and closed roads.
Total	**0.3**				

The following table compares each alternative, Alternative 1 No Action with Alternative 2 and Alternative 3, to the key issues and indicators identified in Chapter 1.9.3.

Table 2-3: Comparison of how the Alternatives Respond to Key Issues

Comparison Factors		Alternatives		
Key Issue	**Key Indicator(s)**	**Alternative 1**	**Alternative 2**	**Alternative 3**
Managing for recreation in a Key Elk Area (KEA)	Miles of trail within the KEA	50.01	60.81	56.05
Providing parking for existing users and new use of Trail 1	Number of trailhead parking spaces	Undefined Parking Estimated Maximum of 19	40	22
	Parking area square footage	11,325	30,000	15,000
	Number of accessible parking spaces	0	2	2

2.6 PROJECT DESIGN ELEMENTS

In order to minimize potential resource impacts from project activities, project design criteria have been incorporated into the action alternatives unless otherwise specified. Project design criteria are devised in the pre-analysis and analysis phases to reduce environmental impacts and comply with applicable laws and regulations. They include, but are not limited to, best management practices (BMPs), standards and guidelines (S&Gs), and standard operating procedures (SOPs).

2.6.1 RESOURCE PROTECTION MEASURES

Recreation

Analysis of the effects of the action alternative is based on assumptions that the following recreational resource project design criteria would be incorporated.

To maintain the natural appearances of the setting and maintain Recreation Opportunity Spectrum (ROS) norms:

a) Restore areas impacted or denuded of vegetation as a result of project activities as soon as practicable after construction.
b) Retain features in the landscape such as large trees or tree groupings and lava rock outcrops. Maintain as many trees as possible so recreationists travel through a natural-appearing setting.
c) To the extent possible, allow curvature in the trail layout and alignment vs. straight shots so the rider experience is enhanced and views to the surrounding landscape are captured.

To facilitate public safety:

a) Utilize AASHTO standards with regard to trail surfacing, grade and turning radius.

b) Coordinate with Oregon Department of Transportation (ODOT) for surface crossing of Cascade Lakes Highway.

To incorporate accessibility and universal design features as well as reduce conflicts between users:

a) Construct the paved trail to meet the following Designed Use and Trail Class standards:
    a. Designed Use: Hiker/Pedestrian[2]
    b. Trail Class (Appendix B): Trail Class 5, Fully Developed
        i. Tread wide, firm, stable, and generally uniform
        ii. Width generally accommodates two-lane and two-directional travel, or provides frequent passing turnouts
        iii. Commonly hardened with asphalt or other imported material
b) Utilize FS Outdoor Recreation Accessibility Guidelines (FSORAG) and Forest Service Trails Accessibility Guidelines (FSTAG)[3].
c) Ensure accessible parking facilities are designed into developed parking areas and are defined as accessible. Include accessible trail connectivity from developed parking areas to trail access points.
d) Prohibit recreational use of motorized vehicles and equestrian use on all paved trail alignments. Allow motorized wheelchairs or mobility devices[4] on the paved path in pursuant to 36 CFR 212.1.

To provide for sustainable recreation opportunities:

a) Explore partnership agreements for construction and future maintenance of all proposed recreation developments.

Wildlife

To reduce potential negative impacts to wildlife species affected by the action alternatives the following wildlife resource protection measures are recommended.

> WL-RPM-1: Retain snags of all species and decay class unless removal is necessary for human safety. If removed, attempt to retain snags in place as down wood in longest possible length.

[2] Designed Use: The Managed Use of a trail that requires the most demanding design, construction, and maintenance parameters and that, in conjunction with the applicable Trail Class, determines which Design Parameters will apply to a trail.

[3] The FSTAG apply only to trails that meet all three of the following criteria:
1) the trail is new or altered. An alteration to a trail is a change in the original purpose, intent, or function for which the trail was designed.
2) and the trail has a designed-use (in accordance with the Forest Service trails terminology, design and management processes) for hiker/pedestrian use;
3) and the trail connects either directly to a trailhead or to a currently accessible trail.

[4] A wheelchair or mobility device, including one that is battery-powered, is a device that is designed solely for use by a mobility-impaired person for locomotion and that is suitable for use in an indoor pedestrian area (Title V, sec. 507c, of the ADA; 36 CFR 212.1). "Designed solely for use by a mobility-impaired person for locomotion" means that the wheelchair was designed and manufactured solely for use for mobility by a person with a disability. Thus, this term does not include a motorized unit that has been retrofitted to make it usable by a person with a disability. "Suitable for use in an indoor pedestrian area" means usable inside a home, mall, courthouse, or other indoor pedestrian area.

WL-RPM-2: To protect Lewis' woodpeckers using artificial nest structures, trail construction activities should not occur on the section east of the proposed trailhead area to forest boundary between April 15 and August 31. If annual nest box use monitoring by a qualified biologist shows these boxes are inactive by May 31 then the work may occur.

WL-RPM-3: To protect an active red-tailed hawk nest located east of the proposed parking lot disturbing activities should not occur within ¼ mile of the nest between March 1 and August 31. If annual monitoring shows the nest as inactive by May 15 then work may occur.

WL-RPM-4: Provide interpretation material at new parking lot describing importance of winter range to big-game species. Coordinate with Oregon Department of Fish and Wildlife on information regarding Tumalo Winter Range Cooperative Closure area.

WL-RPM-5: Do not encourage use of trails in the Ryan Ranch Key Elk Area between December 1 and March 31 to reduce potential disturbance to big game.

WL-RPM-6: Restrict disturbance activities within ¼ mile of any newly discovered nests. This condition may be waived in a particular year if nesting or reproductive success surveys reveal that the species indicated is non-nesting or that no young are present that year. The following are a list of raptors and their nest restriction dates in which habitat is identified within the project area:

- Red-tailed hawk: March1 – August 31
- Northern goshawk: March 1 – August 31
- Cooper's and Sharp-shinned hawks: April 15 – August 31
- Osprey: April 1 – August 31
- Great gray owl: March 1 – June 30
- Great blue heron: March 1 – August 31

Fisheries and Water

Design stream crossings in Trail 2a section to use the most cost-efficient structure consistent with resource protection needs, facility needs, and types of use and safety obligations (National Core Best Management Practice Rec-4). Recommendation is to harden stream crossings (create fords) or install small bridges over the two channels to prevent rutting.

Soils

Establish and maintain construction area limits to the minimum area necessary for completing the project and confine disturbance to within this area (National Core Best Management Practice, Fac-2).

Rehabilitation of old trail segments shall include re-establishment of original slope contours, surface and subsurface hydrologic pathways where practicable and as opportunities arise (National Core Best Management Practice, Fac-10).

Establish effective ground cover on disturbed sites to avoid or minimize accelerated erosion and soil loss (National Core Best Management Practices, Fac-10).

Scenery

Design criteria for the paved path should consider the following to meet standards and guidelines for the Scenic Views Management Area:

Trailhead

- Screen parking and future expansion area with existing vegetation from traffic passing on Cascade Lakes Highway.
- Provide site design and layout of parking area so it is perpendicular to the Cascade Lakes Scenic Byway and minimizes the viewshed width and visibility.
- Design parking pods to preserve large ponderosa pine ≥ 21 inch diameter and as much shade and natural vegetation for screening as possible.

Paved Path and Undercrossing

- Retain features in the landscape such as large trees or tree groupings and lava rock outcrops.
- Locate viewpoints and design interpretive sites that take advantage of any panoramic views or points of interest if applicable to the area.
- Considered providing shaded rest stops or pull-outs along the route.
- Provide signing that is minimal and low key by avoiding shiny or metallic materials and bright or white colors.
- Allow curvature in the trail layout and alignment vs. straight shots so the rider experience is enhanced and views to the surrounding landscape are captured.
- Use topography and existing vegetation to create a path that invites non-motorized use and limits access to motorized vehicles.
- Restore disturbed native vegetation to edges of path and provide landscape screens around parking areas so vehicles are not visible from surrounding areas.
- Use materials on the trail that blend with the surrounding landscape character and avoid white or light colored aggregate on the shoulders of the trail.
- Maintain as many trees as possible so recreationists travel through a natural-appearing setting.
- Provide screening between the Cascade Lakes Scenic Byway and the undercrossing on the north side of the Scenic Byway through natural appearing earth berms and native vegetation.
- Use native materials that blend with the surrounding landscape for site revegetation and construction of terraced planting areas along the undercrossing connection to the trails.

Invasive Plants

Noxious weed sites would be treated via herbicide and manual removal prior to implementation. Each site would receive at least one herbicide treatment before implementation. These treatments have been authorized in previous NEPA decision.

Trail 2b would be re-routed to avoid a Medusahead population located adjacent to the current trail used by Seventh Mountain Resort. District Botanist would flag areas to avoid.

To avoid the spread of weeds, if a significant weed site is located in a proposed trail, an alternate, uninfested site would be used, unless a workable solution is found between the noxious weed coordinator and the project coordinator to avoid having to move it.

Any fill material brought into the project would be examined by the district botanist or their designee for the presence of invasive plants.

Machinery involved in project activities must be washed prior to entry into the project area.

Machinery would be cleaned daily and after leaving a weed site to prevent the spread of weed seeds. A portable air compressor is recommended for ease of use and efficiency in cleaning the tires and undercarriage.

To help alleviate the concern that weeds would enter the new seedbed that would be created with this project, disturbed areas, in particular project areas which intersect with weed sites, would be seeded with locally adapted native seed making it more difficult for weeds to establish.

Engineering/Roads

Locate the paved path to the south side of the parking area to avoid paved path and road crossings.

Cultural Resources

All known cultural resources located within the area of potential effect (APE) would be flagged for avoidance prior to commencement of the project by the District Archaeologist.

If previously unknown items of prehistoric or historical value are discovered or disturbed during construction, activities would cease in the area affected and the District Archaeologist would be notified. A mitigation plan would be developed in order to address the effects of the project on the resource.

2.6.2 MONITORING

Recreation

Due to the proximity to Bend and the expected duration of visitors site visit, a toilet facility is not planned at the new trailhead. The site will be monitored for human waste and, if necessary, a toilet will be installed to maintain public safety.

CHAPTER 3 – ENVIRONMENTAL CONSEQUENCES

CHANGES BETWEEN THE 30-DAY EA AND FINAL EA

Adding errors were found in the key issue 1 miles of trail in the KEA. Numbers were confirmed using GIS and updated in the wildlife section and throughout the rest of the EA. Updated the existing condition in the Heritage section (3.4.8) and added civil rights 3.5.12 discussion.

3.1 INTRODUCTION

This chapter discusses the existing condition of resources in the Welcome Station Trails project area and discloses the direct, indirect, and cumulative effects each of the alternatives (including the no action) would be expected to have on resources. The duration of these effects may vary depending on the resource in question. This chapter concludes with a discussion of specifically required disclosures.

3.2 CUMULATIVE ACTIONS AND ACTIVITIES

Cumulative effects are analyzed in this chapter. All known present and reasonably foreseeable future activities used by the Interdisciplinary team for their cumulative effects analyses, are located in Table 3-1 below. The duration of direct, indirect, and cumulative effects varies, and is addressed by each resource and subject area to follow. In general, the analysis area would be the project area. If the resource being analyzed necessitates extending the analysis area outside the project area for an appropriate analysis, then the extent of the analysis area is documented under each resource area below and in the specialist reports located in the project record. The project area is 20,277 acres. The following table shows the project area acres by watershed (10th field HUC) and subwatershed (12th field HUC).

Table 3-1: Watershed and Subwatersheds within the Analysis Area

Watershed	Total Watershed Acres	Acres of Watershed in Project Area	Subwatershed	Total Subwatershed Acres	Acres of Subwatershed within Project Area Boundary
North Unit Diversion Dam-Deschutes River	101,224	18,948	**Lava Island Falls – Deschutes River**	12,518	5,581
			Overturf Butte – Deschutes River	31,374	5,640
			Benham Falls – Deschutes River	22,663	7,728
Tumalo Creek	38,004	1,329	**Lower Tumalo Creek**	17,238	1,329

For the purposes of this EA, the cumulative impacts are the sum of the existing condition (which represents all past actions), present actions, and reasonably foreseeable future actions. Reasonably

foreseeable as defined in 36 CFR 220.3 are those Federal or non-Federal activities not yet undertaken, for which there are existing decisions, funding, or identified proposals. Identified proposals for the Forest Service are those that the Forest Service has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal and the effects can be meaningfully evaluated (36 CFR 220.4 (a)(1)). The purpose of the cumulative effects analysis in the EA is to evaluate the significance of the no action and action alternative contributions to cumulative impacts. A cumulative impact is defined under federal regulations as follows:

> "...the impact on the environment which 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).

In order to understand the contribution of past actions to the cumulative effects of the alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environments and might contribute to cumulative effects. "CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions" (40 CFR 1508.7). This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action by action basis. One reason for taking this approach is because focusing on past individual actions would be less accurate than looking at the existing condition, because there is limited information on environmental impacts of individual past actions and no one can reasonable identify each and every action over the last century that has contributed to the existing condition.

The following is a list of the present and reasonably foreseeable future activities within the project area, and on immediately adjacent public and private lands. This list will serve as a guide for resource specialists as they define their Analysis areas for their resource and identify the direct, indirect, and cumulative effects of implementing the Welcome Station Trail Connections alternatives. Reasonably foreseeable future is defined as within the next 5 years for this project. The scale used to derive past, present, and reasonably foreseeable future actions was the 20,277-acre project area boundary.

Table 3-2: Past, Present, and Future Actions

Action	Timing	Description
Roads	Ongoing/Planning	Road system developed: 137.8 miles of roads, 89.3 miles are open, 17.3 miles are closed (maintenance level 1), and 31.2 miles have been decommissioned. Road Maintenance: Grading, ditching, and brushing out of roads. Road Closures: Roads were identified to be closed in the Katalo East, Katalo West, East Tumble projects. West Bend projects proposes to effectively close roads that have been evaluated in past

Action	Timing	Description
		NEPA decisions and not effectively closed on the ground and to close user-created roads within the project area.
Industrial Timber Operations	1920s-1930s	Extensive railroad logging across project area, primarily clearcutting. Land received from Shevlin-Hixon in 1944.
Large Wildfires	1900s	Skyliner Fire burned 114 acres, all within in the project area. Inn of the 7th Mtn. Fire (1988) burned 75 acres, all within the project area. Awbrey Hall Fire (1990) burned 3,032 acres, 531.2 acres within the project area. Dillon Falls Fire burned 17 acres, all within the project area.
Travel Management Rule	Ongoing	Across project area and Forest. Motorized travel in Central Oregon restricted to designated roads and trails only. Access to dispersed camping would have special provisions to limit access in sensitive areas.
Vegetation Management/Fuels Reduction Projects		
Thinning and Other Harvest	1960s, 1970s, 1980s, 1990s, 2000s	Past harvest activities have included: commercial thinning, permanent land clearing, salvage cuts, shelterwood removals, single tree selection cuts, stand clearcut, precommercial thinning, and thinning for hazardous fuels reduction. 1960s: 373.7 acres entered once. 1970s: 1,079 acres entered once. 1980s: 1,731.5 acres entered once; 26 acres entered twice. 1990s: 1,680.1 acres entered once; 586.8 acres entered twice. 2000s: 6,343.6 acres entered once; 2,016.8 acres entered twice; and 882.8 acres entered three times. * *not all past activities harvest recorded* Past harvest has contributed to the current vegetative structure in the area and is reflected

Action	Timing	Description
		in the current condition assessment for forested vegetation and fuels. Multiple entries may be important to soils analysis.
West Bend Vegetation Management	Planning	15,540 acres of the West Bend planning area is within the project area. Commercial thinning, understory thinning, and fuels treatments (pile, mow, burn) would be performed.
East Tumbull HFRA Project	Ongoing/Planned	5,769 acres of East Tumbull are within the project area. Commercial thinning, understory thinning, fuels treatments (pile, mow, burn). Tree harvest finished, understory treatments for fuels remaining.
Katalo East and West Projects	Ongoing/Planned	4,181 acres of Katalo West and 4,676 acres of Katalo East are within the project area. Commercial thinning, understory thinning, fuels treatments (pile, mow, burn). Tree harvest finished, understory tree treatments finished, fuels treatments remaining-burning.
Feline Timber Sale	Ongoing	1.8 acres within project area. Tree harvest and understory treatments finished. Fuels treatments remaining.
Sparky Timber Sale and Hazard Tree Removal	Ongoing/ Planned	27 acres within the project area. Commercial thinning, salvage, understory thinning, fuels treatments (pile, mow, burn).
Recreation		
Cascade Lakes National Scenic Byway	Ongoing	Within center of project area. Brings thousands of Forest visitors into the area. Road maintenance such as paving, weed control, danger tree removal, and snow clearing.
Development of Summer Trail System	Ongoing	Recreation use by hikers, mountain bikers and equestrians primarily during spring, summer and fall seasons. Hike/Pedestrian Trails: 0.6 miles. Mountain Bike Trails: 83.8 miles. Wheeled and bipedal recreation and grooming of trails. Some tree cutting for trail maintenance and public

Action	Timing	Description
		safety. Equestrian Trails: 8.5 miles.
Development of Winter Trail System	Ongoing	Recreation use by cross country skiers, snowshoers, and snowmobilers during the winter season. Groomed Snowmobile Trails: 9.3 miles. Motorized recreation and grooming of trails. Some tree cutting for trail maintenance and public safety.
Deschutes River Area Recreation	Ongoing	Day use at several locations.
Good Dog!	Ongoing	Day use recreation of hikers and dog walkers.
Special Use Events	Ongoing	Summer and Fall running events using the Phil's and Wanoga trails system. Equestrian activities on the Forest offered and guided by the Seventh Mountain Resort. Trail ride activities range from a half-hour trail ride to six hour trail rides to a three or five day camp.
Developed and Dispersed Camping	Ongoing	Dispersed camping is restricted to designated sites within the Deschutes Wild and Scenic River corridor. There are no designated dispersed sites within the project area. Dispersed camping occurs elsewhere throughout the project area. There are no developed camp sites within the project area.
Cascade Lakes Welcome Station and Parking Lot	Implementation 2014	Providing building with power and water, restrooms and paved parking lot for access to the site and trail systems.
Phil's Trailhead Enhancement	Implementation 2014	Providing a paved parking area, toilets and trailhead kiosks. Approximately 1.4 acres impacted.
Ryan Ranch	Analysis and Public Comment Completed	Restoration of wetland, removal of dike, interpretive trails and boardwalk.
Small Projects / Miscellaneous		
Roadkill Firewood	2011	Firewood recreational removal (225.6 acres within project area); dead lodgepole within

Action	Timing	Description
		150 feet of roads; no vehicles off roads.
Wildlife		
Lewis' Woodpecker Nest Bot Utilization	2003 to Present	Annual monitoring of 25 Lewis' woodpecker nest boxes for woodpecker utilization. Eleven of these nest boxes are within 200 meters of Trail 1a. Monitoring indicated a high percentage (72%) of boxes were used with 18 of 25 used in 2011.
Invasive Weeds		
Invasive Plant Control EIS	Planned	Within the project area and across the Forest. Herbicide and manual treatment of invasive plant populations.
Private Land Activities		
Private Land Activities	Ongoing/Periodic	Fuels treatments and new housing structures.
Seventh Mountain Resort (boarders NFS land) Widgi Creek Golf Course and Resort (boarders NFS land) Tetherow Golf Club and Resort (boarders NFS land) Entrada Lodge (boarders NFS land)	Ongoing	Lodging and summer and winter recreation activities.

3.3 BEST AVAILABLE SCIENCE

Forest Service policy is that proposed projects must be consistent with the Forest Plan and other management direction show consideration of "best available science" (Dillard 2007). Science is not absolute or irrefutable and much of what we know in a science context is constantly evolving (Moghissi et al. 2008). This means what constitutes best available science might vary over time and across scientific disciplines (Dillard 2007). An objective of considering best available science is for scientists "to provide a meaningful context to scientific information so that its validity might be judged and therefore useful to the policymaker" (Moghissi et al. 2008).

Analysis information provided in this EA was based on a variety of methodologies, models, and procedures (depending on the resource) all of which are derived from scientific sources included in the Literature Cited section. This EA and the accompanying project record identify methods used, reference reliable scientific sources, discuss responsible opposing views, and disclose incomplete or unavailable information, scientific uncertainty, and risk (See 40 CFR 1502.9(b), 1502.22, and 1502.24). Personal opinions were generally judged not to be best available science. Peer-reviewed science was evaluated, and the Forest Service recognized the value to independent peer review. All Forest Service research literature is peer reviewed following USDA Information Quality Scientific Research Guidelines.

3.4 ALTERNATIVE EVALUATION

3.4.1 RECREATION

This section covers the existing conditions and effects on recreation resources. This section incorporates by reference the Recreation Resource Report contained in the project record located at the Bend-Fort Rock Ranger District. Specific information on methodologies, assumptions, consistency with Forest Plan, and other details are contained in the report. A summary of the existing condition and predicted effects of the alternatives evaluated are discussed in this section.

Introduction

The recreation resources analysis describes the anticipated effects on recreation access, social encounters, recreation activities and experience, and economics within the Deer Habitat (MA7), Scenic Views (MA9), Intensive Recreation (MA11), and Wild and Scenic Rivers (MA17) Management Areas.

The land uses analysis describes the anticipated effects on access, safety and revenue for permitted land uses within the Deer Habitat (MA7), Scenic Views (MA9), Intensive Recreation (MA11), and Wild and Scenic Rivers (MA17) Management Areas.

The effects analysis is based on assumptions that the recreational resource project design criteria (Ch. 2.6.1) would be incorporated.

Recreation Resource Analysis

The analyses of environmental effects to recreational resources are assessed based on the following measures:

A. The Recreation Opportunity Spectrum (ROS) is used as a framework managing recreation development (Clark and Stankey 1979). Proposed trails and trailhead in both action alternatives are within a Roaded Natural classification. The recreation opportunity is comprised of the activities, setting and experience a visitor may engage in. The opportunity can be further described with established elements and has been used to structure indirect and direct effects discussions (Appendix B). These elements are:

Access: Access includes type and mode of travel. Highly developed access generally reduces the opportunities for solitude, risk, and challenge. However, it can enhance opportunities for socializing, and feelings of safety and comfort. For the Roaded Natural classification, less developed access is compatible while fully developed access is the norm.

Measure – Conformity with Roaded Natural Parameters for Access					
	Cross-Country Travel	**Non-Motorized Trails**	**Motorized Trails and Primitive Roads**	**Roads Not Maintained for User Comfort and All Highway Vehicles**	**Full Access**
Roaded Natural	Compatible	Compatible	Compatible	Norm	Norm

Remoteness: Remoteness refers to the extent to which individuals perceive themselves removed from the sights and sounds of human activity. A lack of remoteness is important for some setting experiences. In the Roaded Natural classification, remoteness is not a critical component; therefore, remoteness is not addressed further in this analysis.

Naturalness: This refers to the degree of naturalness of the setting; it affects psychological outcomes associated with enjoying nature. This indicator is portrayed by using a compatible visual quality objective (VQO) for each setting, as shown in the matrix on the next page. The USDA Landscape Management Handbook provides further guidance. This criterion is address in Section 3.4.3 Scenery of this environmental analysis and is not further addressed in this section.

Facilities & Site Management, Visitor Impacts and Visitor Management & Information: These measures would address key issue 2 (Chapter 1.9.3), assessing how each alternative provides parking for existing users in the Entrada area and new use of the proposed paved trail (Trail 1).

1. Number of parking spaces at the trailhead
2. Square footage of parking area
3. Number of accessible parking spaces provided

Facilities and site management refers to the level of site development. A lack of facilities and site modifications can enhance feelings of self-reliance and independence, and can provide experiences with a high degree of naturalness. Highly developed facilities can add feelings of comfort and convenience, and increase opportunities for socializing. Within areas classified as Roaded Natural, a range of facilities from undeveloped to rustic using native materials is compatible. Some facilities designed primarily for user comfort with synthetic materials is inconsistent, but acceptable. Facilities designed for user comfort and convenience with synthetic materials commonly used is generally unacceptable.

Measure – Conformity with Roaded Natural Parameters for Facilities and Site Management					
	No facilities for use comfort **Rustic and rudimentary facilities for site protection only** **Use undimensioned native materials only**	**Rustic and rudimentary facilities primarily for site protection** **No evidence of synthetic materials** **Use undimensioned native materials**	**Rustic facilities providing some comfort for the user as well as site protection** **Use native materials with refinement in design** **Synthetic materials not evident**	**Some facilities designed primarily for use comfort and convenience** **Synthetic but harmonious materials are incorporated** **Design may be more complex and refined**	**Facilities mostly designed for user comfort and convenience.** **Synthetic materials commonly used** **Facility design may be highly complex and refined but in harmony or complimentary to the site**
Roaded Natural	Compatible	Compatible	Compatible	Inconsistent	Unacceptable

The visitor impact factor refers to the impacts of visitor use on the environment. The relevant question for managers is not "how can impacts be prevented," but rather, "how much change would be allowed and which actions are appropriate for control." The matrix in Appendix B suggests appropriate actions for controlling impacts on soil and vegetation. Impacts on wildlife habitat and on air, water, and sound quality affect the visitor's experience, and visitor impacts can also alter wildlife habitat or displace wildlife species, including management indicator species, which provide an important means of monitoring recreation related impacts on fish and other wildlife. Within areas classified as Roaded Natural, appropriate actions for controlling impacts on soil and vegetation range from no site hardening to subtle site hardening that is in harmony with the surroundings. The effects to wildlife, botany, and other resources are evaluated in each respective section of the environmental analysis and are not further addressed in this section.

Measure – Conformity with Roaded Natural Parameters for Visitor Impacts					
	Unnoticeable impacts **No site hardening**	**Subordinate impacts** **No site hardening**	**Subordinate impacts** **Limited site hardening**	**Subtle site hardening**	**Subtle site hardening** **Site hardening may be dominant but in harmony**
Roaded Natural	Compatible	Compatible	Compatible	Norm	Inconsistent

Visitor management and information includes the degree to which visitors are regulated and controlled as well as the level of information and services provided for visitor enjoyment. In some opportunity settings, controls are expected and appropriate. For instance, people sometimes seek developed settings for security and safety. Elsewhere, onsite controls may detract from desired experiences, such as independence, self-reliance, and risk-taking. The type and level of information, and where it is provided to the visitor, may facilitate or hinder a desired experience. Onsite interpretive and directional signing may adversely affect the visitor where experiences such as self-discovery, challenge, and risk are important. In other situations, onsite information may be essential to achieve desired experiences. Within areas classified as Roaded Natural, a range of visitor management and information from low regimentation and no onsite controls or information to obvious and regimented controls and more complex visitor information facilities that harmonize with the area are acceptable. Controls that are less harmonious and sophisticated information exhibits are generally unacceptable in Roaded Natural settings.

Measure – Conformity with Roaded Natural Parameters for Visitor Management					
	Low regimentation **No onsite controls or information facilities**	**Subtle onsite regimentation and controls** **Very limited information facilities**	**Onsite regimentation and controls are noticeable but harmonize with the natural environment** **Simple information facilities**	**Regimentation and controls obvious and numerous but harmonize** **More complex information facilities**	**Regimentation and controls obvious and numerous** **Sophisticated information exhibits**
Roaded Natural	Compatible	Compatible	Norm	Inconsistent	Unacceptable

Social Encounters: This factor refers to the number and type of other recreationists met along travelways or camped within sight or sound of others. This setting indicator measures the extent to which an area provides experiences such as solitude, or the opportunity for social interaction. Increasing the number of visitors to an area changes the kind of recreation experience offered, attracting new users and causing others to leave. Moderate to low visitor contacts are the norm within Roaded Natural areas with moderate to high visitor contacts on trails inconsistent, but acceptable and contacts with high numbers of people onsite and within areas surrounding the site unacceptable.

Measure – Conformity with Roaded Natural Parameters for Social Encounters					
	6 parties or less met per day	**6 to 15 parties met per day**	**Moderate to high contact on roads**	**Moderate to high contact in developed sites on roads and trails**	**Large numbers of users onsite and in nearby areas** **High number of social encounters**
Roaded Natural	Compatible	Compatible	Norm	Inconsistent	Unacceptable

B. Recreation Activities and Experience: Effects on recreation activities and experience in an affected area as well as the effects on recreation activities and experience in other areas (e.g. displacement).

C. Economics: An economics element is included to help completely describe effects to a sustainable recreation program where management strives to balance overlapping environmental, social and economic components of a recreation program. The report assesses the effects on recreation-based revenue including permitted special uses (outfitter/guides and events) and tourism.

Proposed trails are intended for use during the spring, summer, and fall therefore, affects to winter recreation resources are not analyzed.

Land Use Analysis Methods

The analyses of environmental effects to permitted land uses included in this report are assessed based on the following measures:

A. Access: Description of the type and scope of access affected and the timing or season when access may be affected.

B. Safety: Effects to the permittee's safety including ingress and egress to permitted areas and safety during the use of those areas.

Recreation Existing Condition

Recreation use in the area is expected to increase as the population of Bend, Sunriver, and surrounding communities increase and as the area draws more tourists to enjoy the recreation opportunities provided on the National Forest. As the residential development on the west side of Bend grows and the demand for alternative transit opportunities increases, the use of roads and trails providing direct connections between Bend and the Forest is expected to increase as well.

The project area has been divided into three analysis areas: a) Entrada, b) Phil's trail, and c) Wanoga and Deschutes River trail areas.

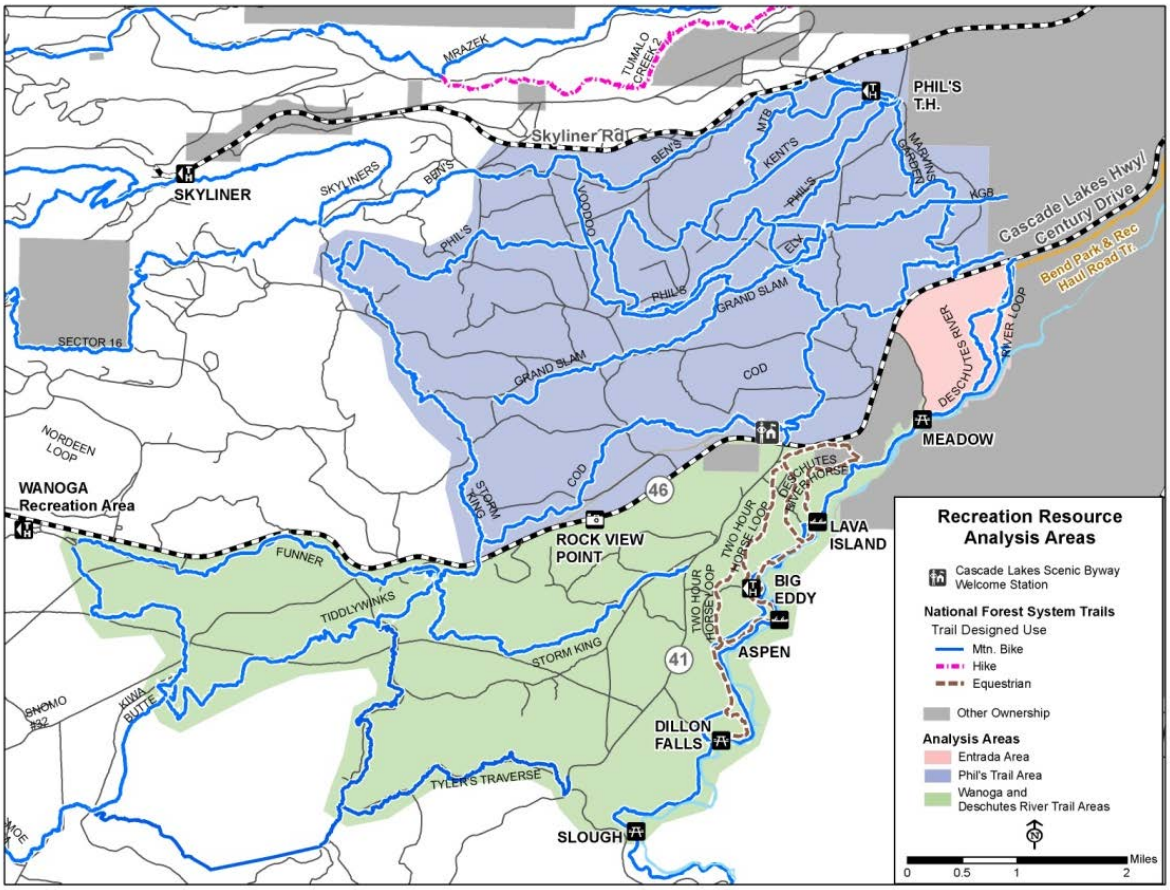

Figure 3-1: Zones Used to Summarize the Effects Analysis

Entrada Zone

This zone includes lands between Bend, Meadow road, Cascade Lakes Highway (Century Drive) and the Deschutes River. The ROS classification is Roaded Natural.

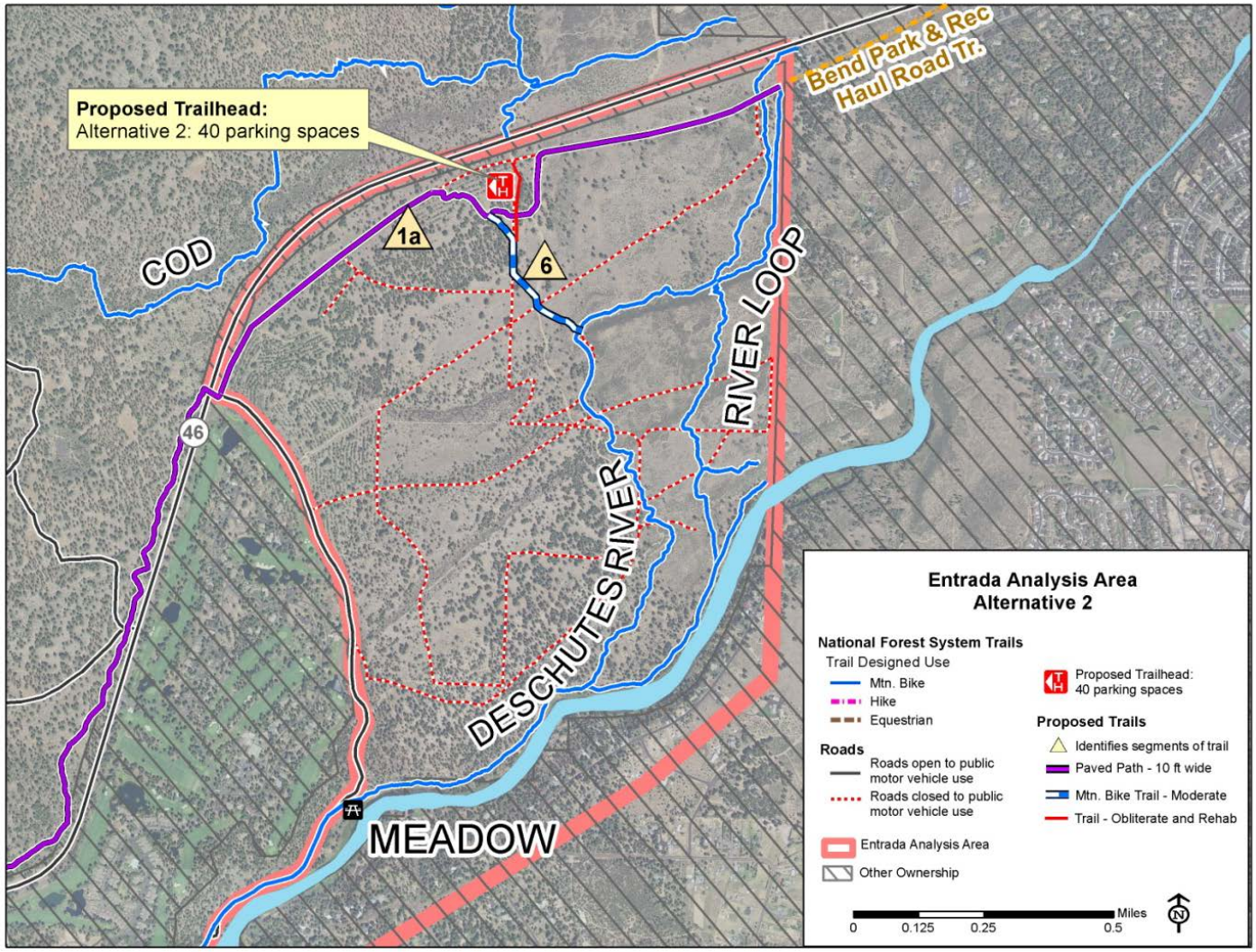

Figure 3-2: Entrada Analysis Zone

Access: The Entrada zone (south of Cascade Lakes Highway) is used primarily by Bend residents and visitors to nearby residential areas and resorts for walking, running, and biking. The zone encompasses both developed and undeveloped recreation opportunities, and includes the area locally known as 'Good Dog!' due to its popularity with visitors recreating with dogs. Overall, the confined nature of the zone (bordered by private land, the highway, and the river), leads to regular patterns of use and opportunities that are more social and defined across the area.

Informal parking areas have developed off Cascade Lakes Highway along the access to the utility maintenance road (aka Good Dog!) and at the Meadow road turn-off. Based on data collected during the spring and summer of 2013, there are an average of six vehicles parked at the Good Dog! parking area at one time (Table 3-3). Meadow Day Use is the primary developed recreation parking area for users of the area.

National Forest System trails in the Entrada area include the Deschutes River, River Loop, and Entrada Loop trails. The Bend Park and Recreation Haul Road trail connects to the Deschutes River trail to the east; future plans call for paving of the Haul Road trail. In addition to System trails, a system of roads that have been closed to motorized vehicles and several user-created (unauthorized) trails are used by runners and walkers. There are few roads in the areas open to public motorized use subject to the Deschutes National Forest travel management rule. Cascade Lakes Highway bounds the area to the north, and is a high speed, moderate use, paved highway. There are no developed campgrounds and little to no dispersed camping. Rock climbing and bouldering are popular on the rock formation adjacent to the Deschutes River trail along the river.

Facilities & Site Management, Visitor Impacts and Visitor Management & Information: Beyond Meadow Day Use area and the developed trails, there are few signs, information, or management controls within this zone. A road running through the area parallel to the Cascade Lakes Highway is closed to the public, but used by land use permittee's to maintain utilities in the area. The access road to the maintenance road and the area between two gates on the maintenance road makes up the dispersed parking area known as Good Dog! (Figure 3-3). Visitors park in front of the gates and along the access road off Cascade Lakes Highway. This dispersed parking lot was not designed to safely accommodate the level of use it receives. Forest Service personnel has observed that when the number of vehicles parked at this site exceeds 8 to 10, there is potential for the safety of drivers, pedestrians and dogs to be compromised. A volunteer group, DogPAC, has adopted the Good Dog! area providing trash cans, dog waste bags, and log fences that act as foot traffic controls.

Figure 3-3: Good Dog! Dispersed Parking Area

Table 3-3: Number of Vehicles Parking at the Good Dog! Dispersed Parking Area

Month	Number of Observations	Average number cars at one time	Number of Observations Weekday	Average number cars at one time: Weekday	Number of Observations: Weekend	Average number cars at one time: Weekend
April	12	5.8	12	5.8	0	-
May	28	7.1	24	6.3	4	11.8
June	39	7.1	30	7.4	9	6.2
July	15	3.9	11	2.7	4	7.0
TOTAL	**94**	**6.4**	**77**	**6.1**	**17**	**7.7**
Minimum		**0**				
Maximum		**19**				
Median		**5.0**				
Mean (Average)		**6.4**				
Standard Deviation		**3.8**				

Social Encounters: Peak season for this zone is early spring through late fall. Contact with other visitors may be common and frequent during the peak season, especially on system and user-created trails.

Recreation Activities and Experience: The primary uses in this zone include walking, running and biking. The area has become a destination for runners and walkers seeking naturally surfaced trails near town, especially those wanting to recreate with their dogs. The surrounding forest maintains its natural character with evidence of past and current vegetation management and timber harvest.

Phil's Trail Zone

This zone includes the area north of Cascade Lakes Highway (FSR 4600000) between Bend, the Storm King mountain bike trail, and Skyliners road. Also included in this zone is the Cascades Lakes Highway Welcome Station (to be constructed northwest of the Cascade Lakes Highway and the FSR 41 intersection) and the connection to the existing Cascade Lakes Highway hiker and pedestrian undercrossing east of the Cascade Lakes Highway and the FSR 41 intersection. LRMP management area allocations include Deer Habitat, General Forest, and Scenic Views. The ROS classifications for this area is Roaded Natural.

Access: The area includes the popular trail system known as the Phil's trail system. The trails are popular with mountain bikers, hikers and runners. The extensive and well-defined trail and road systems lead to regular patterns of use and opportunities that are more social and defined across the area.

The area is bounded to the east by residential areas and resorts and is accessed both by vehicle and by visitors walking or biking. Informal parking areas have developed along Skyliners road. Phil's, Skyliners and Swampy Lakes trailheads are the primary developed recreation parking areas for users of the Phil's trail system. When constructed, the Welcome Station would include a trailhead with approximately 15 parking spaces accessing the COD trail. An undercrossing was installed under Cascade Lakes Highway east of FSR 41 in 2012 with the vision of future trail connections that would serve visitors to the area and guests from the Seventh Mountain Resort. Currently, the undercrossing

serves no recreation function. Shuttling is popular with mountain bikers, with bikers being dropped off by Cog Wild (under permit with the Forest), or private transport and riding back into town via the Phil's trails, COD, or the Deschutes River trail.

There are no developed campgrounds. Use of forest roads in the area is important for access to dispersed recreation sites, hunting, access to rock climbing areas and other activities like wildlife viewing, driving for pleasure, gathering forest products (firewood and mushrooms) and off-highway vehicle (OHV) use.

Facilities & Site Management, Visitor Impacts and Visitor Management & Information: Visitor facilities, information and management controls include concentrated information at developed trailheads and minimal directional information along trails. The Welcome Station is located along Cascade Lakes Highway (Century Drive) and would be a highly developed information site where visitors can access forest information, attain passes and permits, and enjoy interpretive displays. The zone is within a deer winter management area and the area is closed to motorized access in the winter. The Ryan Ranch Key Elk Area covers a portion of the analysis area.

Social Encounters: Contact with other visitors on system trails may be common and frequent during peak season. Locals know that the best conditions are in the spring and fall months when there is more moisture and the trails are not dry and dusty, however, the trails are popular throughout the spring, summer and fall. The new trailhead associated with the Welcome Station would provide direct trail access onto the COD mountain bike trail, which is rated as a more difficult trail. Contact and encounters with other visitors may be high near developed sites, but remains moderate or low in areas outside of developed sites and system trails.

Recreation Activities and Experience: The primary uses in the zone include walking, running, and biking. Dispersed recreation includes recreation activities that take place outside of sites or areas that are developed or managed to concentrate recreation use. Dispersed camping occurs throughout the area. Due to the lack of water, these sites are generally small and camping serves as a secondary activity (generally trail use is the primary recreation activity). Road bikers and roller-skiers use the shoulders of the Cascade Lakes Highway. A user-built (unauthorized by the Deschutes National Forest) disc/Frisbee golf course has developed in the area across from Widgi Creek Golf Course. The course currently crosses the COD trail, raising safety concerns, and this user-built course would be removed in the fall of 2013. The removal of these unauthorized features is part of routine land management activities for public safety and resource protection, and is not associated with the activities proposed in this project. Developed disc golf courses near Bend include Mt. Bachelor Ski Area (for a fee under Special Use Permit), Central Oregon Community College, and Pine Nursery (Bend Park and Recreation). Rock climbing and bouldering along the rim rock formations in the area is also popular.

Consistent with Forest Plan standards and guidelines, TR-1, the Phil's trail system was developed to provide a variety of experiences including more difficult trails. Currently, sections of the COD trail could be categorized as easy or moderate difficulty.

The surrounding forest maintains its natural character with evidence of past and current vegetation management and timber harvest.

Wanoga and Deschutes River Zone

This zone includes the area south of Cascade Lakes Highway (FSR 46) to the Deschutes River. LRMP management area allocations include Scenic Views, Intensive Recreation, and Wild and

Scenic River (the area south of the FSR 41 is within the Upper Deschutes Wild and Scenic River corridor). The ROS classification for the area is Roaded Natural.

Access: The zone includes the Wanoga trail system and mountain bike event area to the north of the 41 road and the Deschutes River trails and developed recreation sites to the south. Mountain bike trails in the Wanoga area, approved in a 2008 decision, are nearly complete. As these trails are developed and used, patterns of mountain bike trail use and opportunities within the area are becoming more social and defined.

Informal parking areas have developed along FSR 41 and the Cascade Lakes Highway to access the Wanoga trail system, with Swampy Lakes and Wanoga trailheads serving as the primary developed recreation parking areas. Meadow, Lava Island, Big Eddy, Dillon, and Slough day use sites serve as trailheads for hikers and bikers, put-in/take-out sites for river access and as picnic sites. The equestrian trails in the area include the Deschutes River horse trails, Dillon Falls horse trail, and the trails developed for use by the clients of the Seventh Mountain Resort (under special use permit, but open to the public). Shuttling is popular with mountain bikers, with bikers being be dropped off by Cog Wild (under permit with the Forest) or private transport to begin their ride on the Wanoga trails and riding back to Bend or Sunriver of the Deschutes River or COD trails.

Use of forest roads in the area are important for access to dispersed recreation sites, hunting and other activities like wildlife viewing, driving for pleasure, gathering forest products (firewood and mushrooms) and off-highway vehicle (OHV) use.

Facilities & Site Management, Visitor Impacts and Visitor Management & Information: Visitor facilities, information and management controls include concentrated information at developed trailheads and day use sites and minimal directional information along trails. The Ryan Ranch Key Elk Area covers a portion of the analysis area and LRMP management direction guides all past and future decisions within the key elk area. Within the Upper Deschutes Wild and Scenic River corridor, located south of FSR 41, dispersed camping is limited to designated sites (there are no designated sites within the project area) and mountain biking is restricted to designated trails with no off-trail use permitted.

Social Encounters: Use on trails is relatively high from early spring through late fall. Contact with other visitors may be common and frequent the during peak season. Contact and encounters with other visitors may be high near developed sites, but remains moderate or low in areas outside of developed sites and system trails. The area south of FSR 41 is within the Upper Deschutes Wild and Scenic River corridor with an annual carrying capacity of 44,000 annual non-commercial use days accessed.

Recreation Activities and Experience: The Wanoga trails are used primarily by mountain bikers and the area hosts permitted mountain bike events in the spring and fall.

The primary uses in the zone include walking, running, biking, equestrian use, non-motorized river uses and picnicking. Dispersed camping is permitted only within designated campsites in the Upper Deschutes Wild and Scenic River corridor, however there are no designated sites within the project area. Camping does occur north of FSR 41. Due to the lack of water, these sites are generally small and camping serves as a secondary activity (generally trail use or hunting are the primary recreation activities). Other uses that are popular in the area include disc/Frisbee golf.

The surrounding forest maintains its natural character with evidence of past and current vegetation management and timber harvest.

Overall Project Area

Access: Whether shuttling, riding from town, or riding from developed or informal parking areas, the large looping system of trails throughout the project area allows mountain bikers to ride throughout the three recreation areas (Entrada, Phil's Trails, and Wanoga and Deschutes River areas).

Economics: The close-by outdoor recreation opportunities provided in the project area are an important factor in the 'livability' of the community and support the region's growing outdoor recreation based economy. The project area as a whole is located adjacent to the community of Bend and encompasses some of the most popular outdoor recreation areas for residents, visitors, permitted recreation businesses and regional and national events.

The 2012 Bend Area Summer Visitor Intercept Survey completed by Visit Bend reported that 33% of respondents reported their main purpose for visiting Bend was outdoor recreation and 40% reported their main purpose as leisure and sightseeing. Fifty-three percent reported participating in hiking/trail running, 15% participated in mountain biking and 18% in road biking (RRC Associates Inc., November 2012).

Recreation Effects Analysis

Direct, Indirect Effects

Alternative 1 – No Action

Under this alternative, the non-motorized paved path and trailhead between Bend and the Cascade Lakes Scenic Byway Welcome Station (Welcome Station) and key mountain bike trails connecting the Welcome Station to the Wanoga and Phil's trail systems would not be constructed. The no action alternative would not meet the purpose and need to provide non-motorized trail connectivity between the Welcome Station and the City of Bend and between the Welcome Station and the Wanoga, Deschutes River and Phil's trail systems. A paved non-motorized trail and developed trailhead parking would not be constructed between the Welcome Station and the City of Bend. Mountain bike trail connections between the Welcome Station and the Wanoga and Phil's trail systems would not be constructed.

Access

The area currently accommodates a full spectrum of recreation access. This would not change under the no action alternative.

Measure – Conformity with Roaded Natural Parameters for Access					
	Cross-Country Travel	Non-Motorized Trails	Motorized Trails and Primitive Roads	Roads Not Maintained for User Comfort and All Highway Vehicles	**Full Access**
Roaded Natural	Compatible	Compatible	Compatible	Norm	**Norm**

The no action alternative would not meet the long-term goals for alternative transit options and enhanced access to trail networks between the City of Bend and the Deschutes National Forest. Recreation use and the demand for direct trail connections between Bend and the Forest would

continue to increase due to population growth, increased tourism and the increasing desire for options for alternative transportation.

No additional trails would be constructed to connect the Welcome Station to Bend or to the existing trail systems to address this increasing use and demand for alternative transportation. Access between Bend and the Forest and among the trail systems would not be improved and in some places, safety may be compromised.

Entrada Area

Instead of connecting into a paved trail leading to the Welcome Station, the planned paved Haul Road trail (Bend Park and Recreation) would direct visitors onto the existing trails (designed use: single track mountain bike) and closed roads in the Entrada area. Visitors would also continue to access this area by parking in the dispersed parking area locally known as 'Good Dog!'.

Phil's Area

The primary way to access the Welcome Station, an important visitor contact facility, would be by vehicle, although some cyclists may access the site by riding the Cascade Lakes Highway or the more difficult COD mountain bike trail. The Welcome Station trailhead would connect visitors onto the COD trail, a trail with a more difficult trail rating. Directing novice users onto the more difficult trail would create safety concerns and compromise the recreation experience for more experienced riders on this more difficult trail. The Cascade Lakes Highway hiker and pedestrian undercrossing east of FSR 41, installed with the vision of future trail connections that serving visitors to the area and guests from the Seventh Mountain Resort, would continue to serve no recreation function.

Wanoga and Deschutes River Areas

A mountain bike trail connecting Tyler's Traverse and Storm King trails up to the Cascade Lakes Highway undercrossing would not be constructed. Bikers would continue to use the Deschutes River trail to get back to Bend and Sunriver. This section of the Deschutes River trail is a high use trail, and growing number of mountain bikers using this sections adds to trail congestion.

Facilities & Site Management, Visitor Impacts and Visitor Management & Information
Facilities and site management in the analysis area include rustic facilities with developments primarily at designated trailheads and day use areas. The existing trails are native surfaced and parking areas are either native surfaced or graveled. There is some use of synthetic materials (concrete toilets, picnic tables, and some metal signs), but these are designed to blend into the natural environment and are not prominent. These conditions would not change under the No Action Alternative.

Measure – Conformity with Roaded Natural Parameters for Facilities and Site Management					
	No facilities for use comfort Rustic and rudimentary facilities for site protection only Use undimensioned native materials only	Rustic and rudimentary facilities primarily for site protection No evidence of synthetic materials Use undimensioned native materials	**Rustic facilities providing some comfort for the user as well as site protection** **Use native materials with refinement in design** **Synthetic materials not evident**	Some facilities designed primarily for use comfort and convenience Synthetic but harmonious materials are incorporated Design may be more complex and refined	Facilities mostly designed for user comfort and convenience Synthetic materials commonly used Facility design may be highly complex and refined but in harmony or complimentary to the site
Roaded Natural	Compatible	Compatible	**Compatible**	Inconsistent	Unacceptable

Site hardening to control impacts on soil and vegetation in the analysis area range from no site hardening to subtle site hardening. Hardening is used primarily in concentrated use areas, such as parking lots and kiosk areas. These conditions would not change under the No Action Alternative.

Measure – Conformity with Roaded Natural Parameters for Visitor Impacts					
	Unnoticeable impacts No site hardening	Subordinate impacts No site hardening	Subordinate impacts Limited site hardening	**Subtle site hardening**	Subtle site hardening Site hardening may be dominant but in harmony
Roaded Natural	Compatible	Compatible	Compatible	**Norm**	Inconsistent

Visitor management and information in the area ranges from low regimentation with no onsite controls or information to noticeable visitor information facilities such as bulletin boards and interpretive panels. These conditions would not change under the No Action Alternative.

Measure – Conformity with Roaded Natural Parameters for Visitor Management					
	Low regimentation No onsite controls or information facilities	Subtle onsite regimentation and controls Very limited information facilities	**Onsite regimentation and controls are noticeable but harmonize with the natural environment** **Simple information facilities**	Regimentation and controls obvious and numerous but harmonize More complex information facilities	Regimentation and controls obvious and numerous Sophisticated information exhibits
Roaded Natural	Compatible	Compatible	**Norm**	Inconsistent	Unacceptable

Entrada Area

The parking area known as Good Dog! would not be improved to provide safe public access. Forest Service personnel has observed that when the number of vehicles parked at this site exceeds 8 to 10, there is potential for the safety of drivers, pedestrians and dogs to be compromised. A visitor information kiosk would not be constructed and land managers would not install a toilet if necessary to address sanitation concerns if they arise. Interpretive signs would not be installed to enhance the visitor experience and provide onsite information about the natural environment and history.

Key Issue 2: Providing parking for existing users in the Entrada area and new use of the proposed paved trail (Trail 1).

Number of parking spaces at the trailhead

The existing undefined parking area is not designed and does not have a defined capacity. This dispersed parking lot was not designed to safely accommodate the level of use it receives. Forest Service personnel has observed that when the number of vehicles parked at this site exceeds 8 to 10, there is potential for the safety of drivers, pedestrians and dogs to be compromised. Based on data collected during the spring and summer of 2013, there are an average of 6.4 vehicles parked at the Good Dog! parking area at one time and the highest recoded vehicle count at the existing dispersed parking area was 19 vehicles (Table 3-3).

Square footage of parking area

Visitors currently park along the access road and between the two gates blocking public access from the closed utility maintenance road. The area is estimated to be 11,325 square feet (Table 3-4).

Number of accessible parking spaces provided

No accessible parking spaces are provided.

Table 3-4: Comparison of how the alternatives respond to key issue of providing parking for existing users in the Entrada area and new use of the proposed paved trail.

Key Indicators for Key Issue 2	Alternative 1	Alternative 2	Alternative 3
Number of parking spaces at the trailhead	Undefined Maximum = 19*	40Ŧ	22 Ŧ
Square footage of parking area	11,325**	30,000 Ŧ	15,000 Ŧ
Number of accessible parking spaces provided	0	2	2

*****Based on 2013 vehicle counts (Table 3-3).

** Based on GIS analysis of the roads and areas that are currently used as a dispersed parking area.

Ŧ Based on a conceptual design.

Phil's Area

The Welcome Station incorporates a trailhead, visitor information kiosks, interpretive installations and a point of contact for visitor information and permit and pass sales. New trails connecting the Welcome Station to Bend and to the existing trail systems would not be constructed. A paved path and new mountain bike connections would not draw visitors into this important visitor contact facility from Bend, the Seventh Mountain Resort and the Phil's and Wanoga trail systems.

Social Encounters

Social encounters within the area are moderate to high in developed sites and on trails throughout the analysis area which is inconsistent, but not unacceptable, within Roaded Natural areas. Under the no action alternative, a mountain bike trails from Tyler's Traverse trail up to the Cascade Lakes Highway hiker and pedestrian undercrossing would not be constructed (Trail 2a) leading to continued and growing encounters on the Deschutes River as bikers continue to use the trail to get back to Bend and Sunriver. This section of the Deschutes River trail is a high use trail, and growing number of mountain bikers using this sections adds to trail congestion.

Measure – Conformity with Roaded Natural Parameters for Social Encounters					
	6 parties or less met per day	6 to 15 parties met per day	Moderate to high contact on roads	**Moderate to high contact in developed sites on roads and trails**	Large numbers of users onsite and in nearby areas High number of social encounters
Roaded Natural	Compatible	Compatible	Norm	**Inconsistent**	Unacceptable

Entrada Area

A new paved trail connection, new trailhead and developed NFS trail connection between the trailhead and the Deschutes River trail would not be constructed. Frequent encounters and contact with visitors would continue in this area where both system trails and closed roads are popular for running, walking and biking. A new recreation activity, biking, running or walking on a paved path, would not be provided in the area and the associated increase in visitor use would not lead to increased social encounters.

Phil's Area

Frequent encounters and contact with visitors would continue on trails in this area where the system trails are popular for running, walking and biking. A new mountain bike trail loop rated to be of easier difficulty would not be constructed to provide access between the Welcome Station trailhead and the Phil's trail system. Not only would novice mountain bikers not have this new recreation opportunity adjacent to the Welcome Station, but novice users may use the more difficult trail creating safety concerns and compromising the recreation experience for more experienced riders on this more difficult trail. Contact and encounters with other visitors would continue to be high near developed sites, and remain moderate or low in areas outside of developed sites and system trails.

Wanoga and Deschutes River Areas

Contact with other visitors would continue to be common and frequent on trails, high near developed sites, and moderate or low in areas outside of developed sites and system trails during peak seasons. Mountain bike trails from Tyler's Traverse trail up to the Cascade Lakes Highway hiker and pedestrian undercrossing would not be constructed (Trail 2a) leading to continued and growing encounters on the Deschutes River as bikers continue to use the trail to get back to Bend and

Sunriver. This section of the Deschutes River trail is a high use trail, and growing number of mountain bikers using this sections adds to trail congestion.

Recreation Activities and Experience

The popularity of biking, running and walking across the project area is likely to increase as the population of Bend and the nearby housing developments grows, and as central Oregon's outdoor recreation and tourism economy continues to grow.

Entrada Area

Without a developed parking area, the existing undeveloped parking areas would continue to grow unmanaged, compromising both public safety and user experience.

Phil's Area

Road bikers and roller-skiers would continue to use the shoulders of the Cascade Lakes Highway and rock climbers would continue to use the rim rock formations in the area.

The COD trail would not be rerouted to an alignment that would maintain the more difficult trail difficulty level across the trail. A new trail loop with an easier difficulty rating would not be constructed near the Welcome Station. Access through the Cascade Lakes Highway undercrossing would not be improved, the vision of future trail connections that would serve visitors to the area and guests from the Seventh Mountain Resort would not be met and the Cascade Lakes Highway undercrossing would continue to serve no recreation function.

Wanoga and Deschutes River Areas

The mountain bike trail (Trail 2a) connecting Tyler's Traverse trail up to the Cascade Lakes undercrossing would not be constructed leading to continued and growing encounters on the Deschutes River trail as bikers continue to use the trail to get back to Bend and Sunriver. This section of the Deschutes River trail is a high use trail, and growing number of mountain bikers using this sections adds to trail congestion.

Economics

The close-by outdoor recreation opportunities provided in the project would continue to be an important factor in the 'livability' of the community and support the region's growing outdoor recreation based economy. Area residents, visitors, and businesses would not gain from the addition of a paved path connecting the Haul Road trail though the Forest to the Welcome Station nor from the addition of new mountain bike trails that link the Phil's and Wanoga trail systems.

Alternative 2

Access

The area currently accommodates a full spectrum of recreation access. The actions proposed in Alternative 2 would provide additional opportunities for non-motorized trails and full access to the trailhead. All proposed developments are within the standard parameters for the Roaded Natural ROS classification.

Measure – Conformity with Roaded Natural Parameters for Access					
	Cross-Country Travel	Non-Motorized Trails	Motorized Trails and Primitive Roads	Roads Not Maintained for User Comfort and All Highway Vehicles	**Full Access**
Roaded Natural	Compatible	Compatible	Compatible	Norm	**Norm**

Alternative 2 would meet the long-term goals for alternative transit options and enhanced access to trail networks between the City of Bend and the Deschutes National Forest. As recreation use and the demand for direct trail connections between Bend and the Forest increases due to population growth, increased tourism, and the increasing desire for options for alternative transportation, the additional trails constructed to connect the Welcome Station to Bend and to the existing trail systems would address this increasing use and demand for alternative transportation. Access between Bend, the Forest, and among the trail systems would be improved.

This alternative would provide a level of access that offers opportunities for socializing and the feeling of safety and comfort, which is the norm for the Roaded Natural setting.

Temporary closure of short sections of existing trails and the surrounding general forest area may occur during constructions to provide for public safety.

Entrada Area

A paved trail (Trail 1a) would connect the Bend Park and Recreation Haul Road trail to the Welcome Station providing an alternative transportation opportunity. The trail would be of the highest level of development (Trail Class 5), providing visitors of all abilities a new way to access the Forest and the Welcome Station.

Visitors to the Entrada Area would be able to access this area by parking in the newly developed gravel parking area. The parking area would be improved to provide safe public parking for approximately 40 vehicles. The new parking area would create safe ingress/egress from Cascade Lakes Highway.

Phil's Area

The Welcome Station would be connected to Bend via the paved path (Trail 1a), offering visitors an alternative transportation option to access this important visitor contact facility. Mountain bike trails would be constructed to connect the Welcome Station to Bend and to the existing Wanoga and Phil's

trail systems. Road cyclists, wanting to travel at a high speed, would continue to access the Welcome Station by riding the Cascade Lakes Highway.

From the Welcome Station trailhead visitors could connect onto the more difficult COD mountain bike trail (Trail 4), the easier Welcome Station loop trails (Trails 3a, 3b and 3c), or the paved path. Access through the Cascade Lakes Highway hiker and pedestrian undercrossing (Trail 1b) would create a safe travel corridor between the Wanoga and Deschutes River trail systems and the Phil's trail system north of Cascade Lakes Highway. The proposed trail connections would allow riders to easily and safely ride between Bend, the Welcome Station, the Phil's trail system, the Wanoga trail system, and the Deschutes River trail system. The undercrossing access would also provide access for visitors and customers of the Seventh Mountain Resort (Trails 1b and 2b).

Wanoga and Deschutes River Areas

A mountain bike trail from Tyler's Traverse up to the Storm King trail and the Cascade Lakes Highway undercrossing would complete the connections between these popular trail systems (Trail 2a). Bikers would have an alternate route to the Deschutes River trail to get back to Bend and Sunriver. This would relieve trail congestion along the Deschutes River Trail between Slough Day Use and Bend, a high use section of trail.

Facilities & Site Management, Visitor Impacts and Visitor Management & Information

The native surface trails and unpaved trailhead parking area are consistent compatible with the Roaded Natural classification and consistent with current improvements in the area. The path would be constructed using synthetic materials (asphalt), which is inconsistent, but acceptable within the Roaded Natural classification. Overall, the facilities and materials utilized for site management in the area would continue to fall within the range of 'compatible' with the Roaded Natural classification.

Measure – Conformity with Roaded Natural Parameters for Facilities and Site Management					
	No facilities for use comfort Rustic and rudimentary facilities for site protection only Use undimensioned native materials only	Rustic and rudimentary facilities primarily for site protection No evidence of synthetic materials Use undimensioned native materials	**Rustic facilities providing some comfort for the user as well as site protection** **Use native materials with refinement in design** **Synthetic materials not evident**	Some facilities designed primarily for use comfort and convenience Synthetic but harmonious materials are incorporated Design may be more complex and refined	Facilities mostly designed for user comfort and convenience Synthetic materials commonly used Facility design may be highly complex and refined but in harmony or complimentary to the site
Roaded Natural	Compatible	Compatible	**Compatible**	Inconsistent	Unacceptable

Trails, a parking area, and a visitor information kiosk would be hardened to manage visitor impacts. A paved trail would provide universal access and an alternative transportation route between Bend and the Welcome Station. The paved trail would parallel the Cascade Lakes Highway and synthetic surfacing would be limited to the paved trail. All other hardened areas would blend with the environment, and the area, as a whole, would remain within the norm for the Roaded Natural classification.

Measure – Conformity with Roaded Natural Parameters for Visitor Impacts					
	Unnoticeable impacts No site hardening	Subordinate impacts No site hardening	Subordinate impacts Limited site hardening	**Subtle site hardening**	Subtle site hardening Site hardening may be dominant but in harmony
Roaded Natural	Compatible	Compatible	Compatible	**Norm**	Inconsistent

Visitor management and information would range from low regimentation with no onsite controls or information to noticeable visitor information facilities including a kiosk and interpretive panels at the trailhead.

Measure – Conformity with Roaded Natural Parameters for Visitor Management					
	Low regimentation No onsite controls or information facilities	Subtle onsite regimentation and controls Very limited information facilities	**Onsite regimentation and controls are noticeable but harmonize with the natural environment** **Simple information facilities**	Regimentation and controls obvious and numerous but harmonize More complex information facilities	Regimentation and controls obvious and numerous Sophisticated information exhibits
Roaded Natural	Compatible	Compatible	**Norm**	Inconsistent	Unacceptable

The parking area known as Good Dog! would be improved to provide safe public access. To the extent possible, development of the site would use native materials (e.g. gravel surfacing and rock or log barriers). Synthetic materials may be used to provide universal access to the paved path. The path would be constructed using synthetic materials (asphalt), which is inconsistent, but acceptable within the Roaded Natural classification.

Entrada Area

The parking area known as Good Dog! would be improved to provide safe public access. The trailhead would be moderately developed with a graveled surface. The parking area would safely accommodate approximately 40 vehicles and would have two accessible parking spaces. A parking lot of this size would accommodate existing use which averages 6.4 vehicles. Current samples registered a maximum vehicle count of 19 vehicles, indicating that this parking area could also accommodate additional growth in use that is anticipated due to the development of a paved multi-modal path without exceeding capacity on peak use days.

A visitor information kiosk would be constructed to provide visitors information about recreation opportunities, recreation ethics, and regulations. If needed in the future to address sanitation concerns or changing public needs, a toilet could be installed. Interpretive signs would be installed to enhance the visitor experience and provide onsite information about the natural environment and history.

The designed use of the paved trail would be hiker/pedestrian and it would be constructed to meet Trail Class 5 (fully developed) standards for universal design and accessibility including a 10 foot wide paved surface and maximum 5% grade (Appendix B). The paved trail would allow for a multi-modal, recreation experience and visitor information and enforcement would be used as necessary to encourage the safe use of the paved facility including maintaining safe speeds, respecting other trail users, and maintaining safe control of dogs.

Key Issue 2: Providing parking for existing users in the Entrada area and new use of the proposed paved trail (Trail 1).

Number of parking spaces at the trailhead

The proposed parking lot would accommodate approximately 40 vehicles.

Square footage of parking area

The proposed parking lot would cover approximately 30,000 square feet.

Number of accessible parking spaces provided

Two accessible parking spaces would be provided.

Phil's Area

The Welcome Station incorporates a trailhead, visitor information kiosks, interpretive installations and a point of contact for visitor information, permits and pass sales. New trails connecting the Welcome Station to Bend and to the existing trail systems would be constructed. A paved path and new mountain bike connections would draw visitors into this important visitor contact facility from Bend, the Seventh Mountain Resort and the Phil's and Wanoga trail systems.

Social Encounters

Social encounters within the area are moderate to high in developed sites and on trails throughout the analysis area which is inconsistent, but not unacceptable, within Roaded Natural areas. A mountain bike trails from Tyler's Traverse trail up to the Cascade Lakes Highway hiker and pedestrian undercrossing would be constructed (Trail 2a). This trail is expected to relieve trail congestion and reduce encounters on the Deschutes River as bikers would have an alternate trail to get back to Bend

and Sunriver. While the construction of this trail would not bring encounters within the area into the norm range for a Roaded Natural setting, it is expected to improve the current conditions.

Measure – Conformity with Roaded Natural Parameters for Social Encounters					
	6 parties or less met per day	6 to 15 parties met per day	Moderate to high contact on roads	**Moderate to high contact in developed sites on roads and trails**	Large numbers of users onsite and in nearby areas High number of social encounters
Roaded Natural	Compatible	Compatible	Norm	**Inconsistent**	Unacceptable

Entrada Area

The pave trail connecting the City of Bend to the proposed trailhead, the Welcome Station, and other popular National Forest System trails may draw additional visitors to the area. The parking lot would accommodate 40 vehicles, twice as much as the highest recoded vehicle count at the existing dispersed parking area (19 vehicles). Within the parking area, a well designed and engineered parking lot would improve driver and pedestrian safety and the potential for negative encounters within the parking area should be reduced. The ample parking capacity would accommodate existing use and some growth in use without exceeding capacity. Due to the expanded parking capacity and the development of a new recreation opportunity (the paved path), encounters and contact with visitors would increase.

Phil's Area

A new mountain bike trail loop rated to be of easier difficulty would be constructed to provide access between the Welcome Station trailhead and the Phil's trail system (Trails 3a, 3b and 3c). Novice mountain bikers would have a new recreation opportunity adjacent to the Welcome Station, and would be discouraged from using the more difficult COD trail, easing safety concerns and improving the recreation experience for more experienced riders on this more difficult trail. Frequent encounters and contact with visitors would continue on trails in this area where the system trails are popular for running, walking and biking. Contact and encounters with other visitors would continue to be high near developed sites, and remain moderate or low in areas outside of developed sites and system trails.

Wanoga and Deschutes River Areas

A mountain bike trail from Tyler's Traverse trail up to the Storm King trail and the Cascade Lakes Highway undercrossing would create an alternate route to get back to Bend and Sunriver. This would relieve trail congestion on the Deschutes River trail between Slough Day Use and Bend, a high use section of trail. Contact with other visitors would continue to be common and frequent on trails, high near developed sites, and moderate or low in areas outside of developed sites and system trails during peak season.

Recreation Activities and Experience

The popularity of biking, running and walking across the project area is likely to grow as the population of Bend, Sunriver and nearby housing developments grow and as visitation to the central Oregon to enjoy its recreation resources grows.

Entrada Area

A developed parking area would accommodate existing use of the Good Dog! parking area and improve both public safety and user experience. A non-motorized paved path would create a new recreation opportunity in the area for walkers, runners and bikers, and non-motorized users of all abilities. The path would be closed to equestrian use and to all motorized uses, except for wheelchairs or devices (as defined under 36 CFR 212.1). The new paved trail connection in combination with Bend Parks and Recreation plans to pave the Haul Road trail, would complete a vision for connected recreation facilities between Bend and the Deschutes National Forest.

Phil's Area

The intent of the paved trail is for a multi-modal, recreation experience and bicyclists or roller-skiers. Those wanting to travel at a high speeds would be encouraged to continue to use the shoulders of the Cascade Lakes Highway.

The COD trail would be rerouted to an alignment that would maintain the more difficult trail difficulty level. The reroute would include using the existing ODP trail route and decommissioning or using sections of the existing COD trail for the easier loop trail. To maintain access and protect the recreation experience of rock climbers in the area, the new COD trail would be located above the rimrock that is a popular rock climbing area. A new trail loop with an easier difficulty rating would be constructed near the Welcome Station. Access through the Cascade Lakes Highway undercrossing would be improved, and the vision of trail connections that would serve visitors to the area and guests from the Seventh Mountain Resort of all skill levels would be met.

Wanoga and Deschutes River Areas

A mountain bike trail connecting the Tyler's Traverse and Storm King trails up to the Cascade Lakes Highway undercrossing would be constructed. This new route would allow bikers a good access route to get back to Bend and Sunriver, relieving trail congestion between Slough Day Use and Bend, a high use section of trail.

Economics

The proposed improvements to the recreation infrastructure would enhance the outdoor recreation opportunities available near Bend and Sunriver that are an important factor in the livability of the community and support the region's growing outdoor recreation based economy. Area residents, visitors, and businesses would gain from the addition of a paved path connecting the Haul Road trail though the Forest to the Welcome Station and from the addition of new mountain bike trails that link the Phil's and Wanoga trail systems.

Alternative 3

The direct and indirect effects to the recreation resource for Alternative 3 are similar to those for Alternative 2 except for:

Access

The mountain bike trail (2a) from Tyler's Traverse trail up to the Storm King trail and the Cascade Lakes Highway tunnel would not be constructed. Trail connections between the Phil's and the Wanoga and Deschutes River trail systems would not be created and trail congestion on the Deschutes River trail would not be reduced.

Entrada Area

Visitors to the Entrada area would be able to access this area by parking in the newly developed gravel parking area. The parking area would be improved to provide safe public parking for approximately 22 vehicles. The new parking area would create safe ingress/egress form Cascade Lakes Highway. However, it is likely that use would exceed the designed capacity of the trailhead proposed.

Phil's Area

Without the proposed trail connecting Tyler's Traverse and Storm King trails up to the undercrossing, enhanced connections between the Wanoga/Deschutes River trail systems and the Phil's trail system would not be realized.

Wanoga and Deschutes River Areas

A mountain bike trail from Tyler's Traverse trail up to the Storm King trail and the Cascade Lakes Highway tunnel would not be constructed and trail connections between the Phil's and the Wanoga and Deschutes River trail systems would not be created. Bikers would continue to the use Deschutes River trail to get back to Bend and Sunriver, and trail congestion between Slough Day Use and Bend, a high use section of trail, would not be reduced.

Facilities & Site Management, Visitor Impacts and Visitor Management & Information

Entrada Area

The parking area known as Good Dog! would be improved to provide safe public access. The trailhead would be moderately developed with graveled surface and two accessible parking spaces. The parking area would safely accommodate approximately 22 vehicles and would have two accessible parking spaces (Table 3). A parking lot of this size would accommodate existing use which averages 6.4 vehicles (Table 2). However, current samples registered a maximum vehicle count of 19 vehicles, indicating that the growth in use that is anticipated due to the development of a paved multi-modal path would lead to parking exceeding capacity on peak use days.

Key Issue 2: Providing parking for existing users in the Entrada area and new use of the proposed paved trail (Trail 1).

Number of parking spaces at the trailhead

The proposed parking lot would accommodate approximately 22 vehicles (Table 3-4).

Square footage of parking area

The proposed parking lot would cover approximately 15,000 square feet. (Table 3-4).

Number of accessible parking spaces provided

Two accessible parking spaces would be provided.

Phil's Area

Trail connections between the Phil's and the Wanoga and Deschutes River trail systems would not be made.

Social Encounters

Social encounters within the area are moderate to high in developed sites and on trails throughout the analysis area which is inconsistent, but not unacceptable, within Roaded Natural areas. Under Alternative 3, a mountain bike trail from Tyler's Traverse trail up to the Cascade Lakes Highway hiker and pedestrian undercrossing would not be constructed (Trail 2a) leading to continued and growing encounters on the Deschutes River as bikers continue to use the trail to get back to Bend and Sunriver. This section of the Deschutes River trail is a high use trail, and growing number of mountain bikers using this sections adds to trail congestion.

Measure – Conformity with Roaded Natural Parameters for Social Encounters					
	6 parties or less met per day	6 to 15 parties met per day	Moderate to high contact on roads	**Moderate to high contact in developed sites on roads and trails**	Large numbers of users onsite and in nearby areas High number of social encounters
Roaded Natural	Compatible	Compatible	Norm	**Inconsistent**	Unacceptable

Entrada Area

The new paved trail connecting the Haul Road trail through the area, new trailhead and developed National Forest System trail connection between the trailhead and the Deschutes River trail may draw additional visitors to the area. The parking lot would accommodate approximately 22 vehicles, this is slightly more than the highest recorded vehicle count at the existing dispersed parking area (19 vehicles) (Table 3-3). Within the parking area, a well designed and engineered parking lot would improve driver and pedestrian safety and the potential for negative encounters within the parking area should be reduced. The parking capacity would accommodate existing use and some growth in use, but parking would likely exceed capacity on peak use days, creating the potential for negative encounters among drivers and pedestrians. Due to the developed parking facility and the development of a new recreation opportunity (the paved path), encounters and contact with visitors would increase.

Wanoga and Deschutes River Areas

A mountain bike trail from Tyler's Traverse trail up to the Storm King trail and the Cascade Lakes Highway tunnel would not create an alternate route to get back to Bend and Sunriver. Trail congestion on the Deschutes River trail between Slough Day Use and Bend, a high use section of trail, would not be eased. Contact with other visitors would continue to be common and frequent on

trails, high near developed sites, and moderate or low in areas outside of developed sites and system trails during peak season.

Recreation Activities and Experience

Entrada Area

A developed parking area would accommodate existing use of the Good Dog! parking area, however, growth in use at the site may lead to parking exceeding capacity on peak use days (Table 3-3). The new parking facility would improve both public safety and user experience, but if use exceeds parking capacity, public safety, and user experience would diminish.

Phil's Area

Without the proposed trail connecting Tyler's Traverse and Storm King trails up to the undercrossing, enhanced connections between the Wanoga/Deschutes River trail systems and the Phil's trail system would not be realized.

Wanoga and Deschutes River Areas

A mountain bike trail connecting the Tyler's Traverse and Storm King trails up to the Cascade Lakes Highway tunnel would not be constructed. Trail congestion on the Deschutes River trail between Slough Day Use and Bend, a high use section of trail, would not be eased. Contact with other visitors would continue to be common and frequent the during peak season.

Economics

The proposed improvements to the recreation infrastructure would enhance the outdoor recreation opportunities available near Bend and Sunriver that are an important factor in the 'livability' of the community and support the region's growing outdoor recreation based economy. Area residents, visitors, and businesses would gain from the addition of a paved path connecting the Haul Road trail though the Forest to the Welcome Station and from the addition of new mountain bike trails that link the Phil's trail system to the Welcome Station. The mountain bike connection between Tyler's Traverse and Storm King trails up to the Cascade Lakes Highway tunnel is an important connection that would not be completed under this alternative.

Cumulative Effects

Table 3-2 provides a list of past, ongoing, and reasonably foreseeable projects that occur within the project area.

Proposed and approved recreation projects would increase and enhance trail-based recreation opportunities in the area including: expansion and improvement of Phil's trailhead, construction of the Cascade Lakes Scenic Byway Welcome Station including a day use trailhead, construction the Cascade Lakes Highway pedestrian and bicycle undercrossing, and the completion of the Tyler's Traverse and other trails in the Wanoga trail system. Overall, these recreation enhancements along with those proposed in the Welcome Station Trail Connections project would improve access, recreation experience, and recreation-based revenue. The increase in parking capacity and availability of new recreation opportunities may lead to an increase in use and encounters, however, the connectivity among the trail systems and the mileage of trail available would provide a trail system that is able to accommodate existing use and growth. Encounters would be highest at the concentrated use areas around the trailheads, the Welcome Station, and at key trail intersections.

The paved path proposed in Alternatives 2 and 3 along with the multi-modal, non-motorized paved path between Sunriver, Lava Lands Visitor Center, and Benham East Day Use area (planned for construction in 2014), would set the stage for the Forest to explore options for a future paved travel-way between Bend and Sunriver.

The on-going, future, and planned vegetation management/fuels reduction and recreation projects would affect access to existing developed and dispersed recreation activities in the area. With multiple projects planned within the area over the next five years, the public, especially residents and frequent visitors, would be affected by the cumulative access disturbances. The effects would include road, trail, site, and area closures and the extent of the effect would range from weeklong closures to closures that may last two years. User-created roads and roads identified to be closed under the Katalo East, Katalo West, and East Tumbull projects would be closed during implementation of the West Bend Vegetation project. User-created trails are not protected public investments and may be disturbed during burning and mechanical operations (including timber removal, mowing and mastication). The extent of the trail system and area within the project area would allow the public to find substitute recreation opportunities, even if their preferred location is not available.

Forest Plan Consistency

Both action alternatives would be consistent with the Forest Plan standard and guidelines (USDA 1990), as amended. The Recreation Report, located in the project record, lists all applicable Forest Plan Standards and Guidelines relevant to the project.

Both alternatives would meet the key standard and guidelines for trails; to provide a trail system that is developed to provide a variety of experiences (TR-1).

Both action alternatives would maintain a combination of activities, setting and experience that are consistent with the Recreation Opportunity Spectrum classification of Roaded Natural.

Upper Deschutes Wild and Scenic River Plan

Recreation is identified as an Outstandingly Remarkable Value (ORV) in the Upper Deschutes Wild and Scenic River Plan (UDWSR Plan) due to the range of activities, the variety of interpretive opportunities, and the attraction of the river for vacationers from outside of the region. Both action alternatives (Alternative 2 and 3) are consistent with the UDWSR Plan and would not negatively affect the recreation ORV.

Both action alternatives would move the Forest's recreation resources toward a vision for communities connected to the Forest by multi-modal paved paths by paving 3.4 miles of trail from the Haul Road trail at the Bend Urban Growth Boundary to the Welcome Station and the Cascade Lakes Highway pedestrian and bicycle undercrossing. This action is consistent with and would position the Forest to further explore the construction of a surfaced, primary bike trail from the Bend Urban Growth Boundary to Sunriver, which is listed as a probable action in the Wild and Scenic River Plan.

Alternative 2 would enhance the Forest's ability to meet the recreation guidelines in the Forest Plan for maintaining annual use capacities (R-1) and managing user conflict on the Deschutes River trail (R-12) by constructing a mountain bike trail from Tyler's Traverse trail up to the Storm King trail and the Cascade Lakes Highway hiker and pedestrian undercrossing would complete the connections between these popular trail systems (Trail 2a). Bikers would have an alternate route to the Deschutes

River trail to get back to Bend and Sunriver. This would relieve trail congestion between Slough Day Use and Bend, a high use section of trail.

Land Uses Existing Condition

Permitted land use authorizations in the area include a buried sewer line, overhead phone line, and overhead and buried utility lines (Figure 3-4).

The City of Bend has a permitted buried sewer line that crosses the Entrada area from the Forest boundary west to the private land. The sewer line serves private and vacation homes and the Widgi Creek and Seventh Mountain resorts. A section of the Midstate line from Bend near the Tetherow area, below Cascade Lakes Highway and connecting into the transmission pole south of the highway, is buried. A maintenance road that follows the sewer line (FSR 4600101) is accessed off the Cascade Lakes Highway through the area known as Good Dog! is used by both permittee's. The public currently uses the Good Dog! area as a dispersed parking area to access the Deschutes River trails and the general forest. FSR 4600101 runs through the area parallel to the Cascade Lakes Highway. The road is closed to the public, but used by land use permittees to maintain utilities in the area. The access road to the maintenance road and the area between two gates on the maintenance road makes up the dispersed parking area known as Good Dog! (Figure 3-3). Visitors park in front of the gates and along the access road off Cascade Lakes Highway. This dispersed parking lot was not designed to safely accommodate the level of use it receives. as Forest Service personnel has observed that when the number of vehicles parked at this site exceeds 8 to 10, there is potential for the safety of drivers, pedestrians and dogs to be compromised. When visitors are parked in front of the gates, permittees cannot access the maintenance road from this location. The road is used by the City of Bend and Midstate Electric.

Midstate Electric Cooperative utility lines run from the Forest boundary with Bend, across to the Widgi Creek Golf Course and southwest paralleling the FSR 41. A utility maintenance road (FSR 4600106) accompanies the road and is accessed via a gate off Meadow road. CenturyLink phone lines, Pacific Power and Light utility lines, and Bend Cable (Bend Broadband) utility lines follow along the same corridor.

A Cascade Natural Gas line is buried north of the Cascade Lakes Highway from the Forest boundary with Bend to the Meadow road where it crosses under the highway to serve Widgi Creek and the Seventh Mountain resorts.

Three quarry sites, Seventh Mountain gravel pit, and Miller Butte cinder pits #1 and #2, are located between the Cascade Lakes Highway and FSR 41. These sites are used by various permitees, the Forest Service and individuals with minerals permits to obtain material.

With the construction of the Cascade Lakes Welcome Station, planned for 2014, the Midstate utility line and Bend Cable fiberoptic line would be extended to serve the Welcome Station.

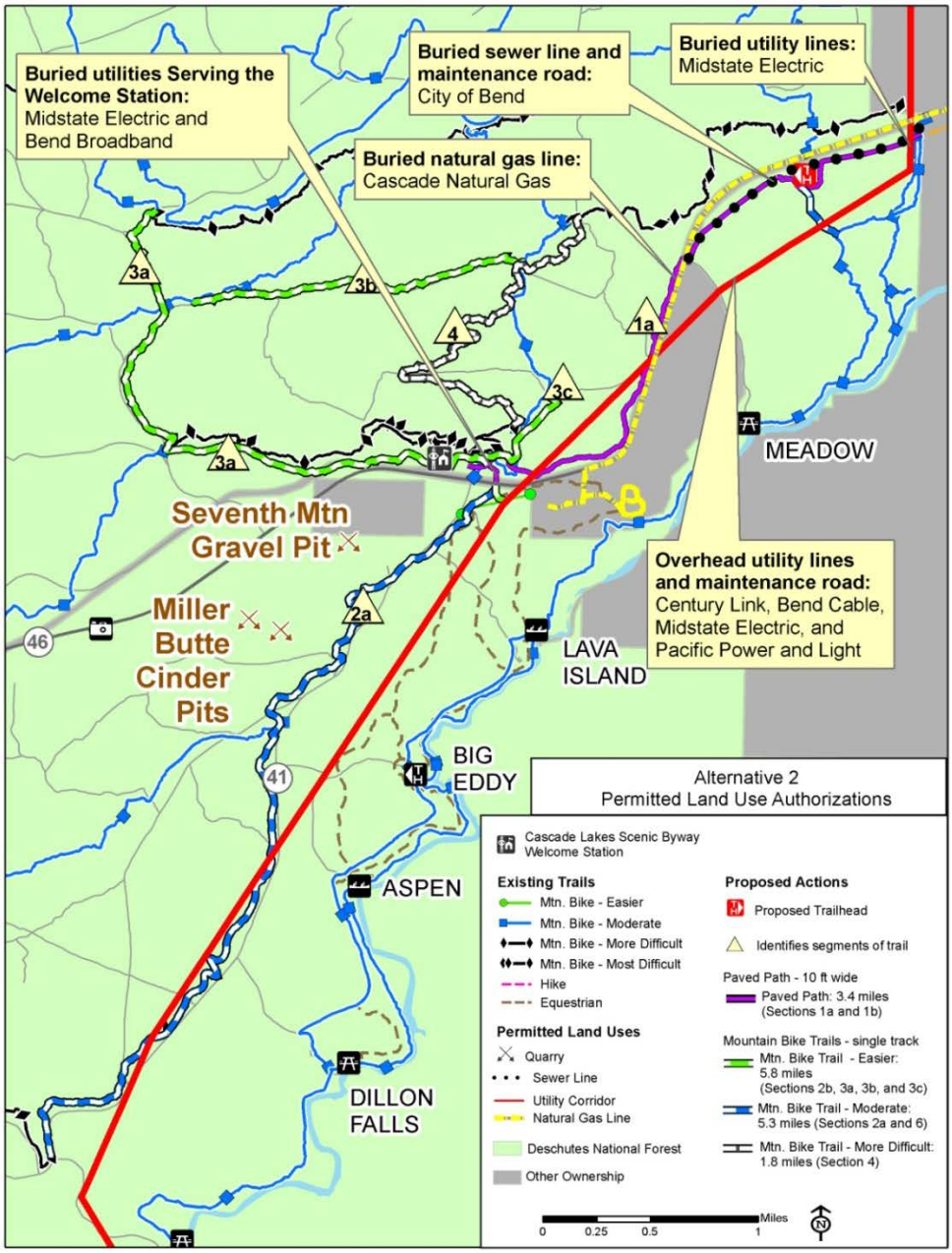

Figure 3-4: Authorized land uses in the area

Land Uses Effects Analysis

Direct, Indirect, and Cumulative Effects

Alternative 1 – No Action

Under this alternative, the non-motorized paved path and trailhead between Bend and the Welcome Station and key mountain bike trails connecting the Welcome Station to the Wanoga and Phil's trail systems would not be constructed. No actions would be taken that would lead to any direct, indirect, or cumulative effects to the permitted land uses in the area.

Alternative 2 and Alternative 3

Alternatives 2 and 3 would allow for a paved non-motorized trail connecting the Haul Road trail to the Welcome Station, designated single-track mountain bike trails that connect the Welcome Station to the existing Phil's trail system, and a trailhead facility that would accommodate 22 (Alternative 3) to 40 (Alternative 2) vehicles. The proposed activities would establish the Welcome Station as a portal to public lands, provide connections between established biking and hiking trail networks, and create an opportunity for multi-modal access and alternative forms of transportation between the city and public lands.

Access and Safety

The proposed paved path (Trail 1a) would be located on the utility maintenance road between the Forest boundary with Bend and the intersection with Meadow road. This maintenance road is used by the City of Bend to maintain an underground sewer line. The path would be constructed over the sewer line, but designed to maintain access for routine sewer line maintenance. The maintenance road is also used by Midstate Electric to maintain their permitted utilities including their transmission pole, located on Forest land. Midstate's buried power lines running to the transmission pole would be buried under the path in a single location near the Forest boundary. These utility lines are constructed in conduit and the paved path should not affect routine maintenance. The path would not preclude authorized land permittees from continuing to use the road to maintain the overhead and buried utilities. The path would have a 10 foot wide paved surface with 1 to 2.5 foot wide shoulders. The design and construction of the path would accommodate the size and weight of standard maintenance equipment. In accordance with standard special use permit clauses, the authorized land use permittee would be responsible for the repair or replacement of any Forest Service owned facilities that are damaged during their operations. If major maintenance is required, in accordance with standard special use permit clauses, the permit holder would be responsible to protect from damage the land, property, and other interests of the United States. If the environment or any government property covered by the permit becomes damaged during the holder's use or occupancy of the permit area, the holder shall immediately repair the damage or replace the damaged items to the satisfaction of the authorized officer and at no expense to the United States. The public currently parking in the area known as Good Dog! often park in front of the gates that access this maintenance road which can make the access difficult. The construction of a trailhead as proposed in Alternatives 2 and 3 would alleviate the issue of blocked gates. Moving the parking area off the access road would also improve the safety of pedestrians, pets and vehicles.

Access to the overhead utilities for Midstate Electric, CenturyLink, Pacific Power and Light, and Bend Cable is accessed from Meadow road and would not be affected by this project.

Under Alternative 2, a single track mountain bike trail would be constructed from Tyler's Traverse trail up to the Storm King trail and the Cascade Lakes Highway tunnel (Trail 2a). This trail would cross roads used to access the Seventh Mountain gravel pit and Miller Butte cinder pits #1 and #2. Permittees would need to use extra caution when accessing these sites. The quarries themselves and the ability for permittees to use these sites would not be affected.

Forest Plan Consistency

All alternatives would be consistent with the Forest Plan standard and guidelines (USDA 1990), as amended. The Recreation Specialist Report, located in the Project Record, lists all applicable Forest Plan standards and guidelines relevant to this project.

3.4.2 WILDLIFE

This section covers the existing conditions and effects of implementation on wildlife resources. This section incorporates by reference the Wildlife Resource Report and Biological Evaluation contained in the project record located at the Bend-Fort Rock Ranger District. Specific information on methodologies, assumptions, consistency with Forest Plan, and other details are contained in the report. A summary of the existing condition and predicted effects of the alternatives are discussed in this section.

Introduction

This section describes potential impacts to terrestrial wildlife species listed by the U.S. Fish and Wildlife Service as Endangered, Threatened or Proposed under the Endangered Species Act of 1973, as amended and USDA Forest Service Pacific Northwest Region Regional Forester Sensitive Species resulting from the proposed Welcome Station Connections Trails project.

This Biological Evaluation meets direction in Forest Service Manual 2600 and the Deschutes National Forest (DNF) Land and Resource Management Plan (LRMP) (USDA FS 1990). This Project Area is within the Environmental Assessment for *the Continuation of Interim Direction Establishing Riparian, Ecosystem, and Wildlife Standards for Timber Sales (Eastside Screens)* (USDA FS 1995) and the Northwest Forest Plan.

This section also describes potential impacts to terrestrial wildlife associated with the implementation of the Welcome Station Trail Connections project on the Bend-Fort Rock Ranger District. This includes evaluating potential impacts to wildlife listed under the Endangered Species Act (ESA) of 1973, as amended, USDA Forest Service Pacific Northwest Region Sensitive Species, Management Indicator Species, migratory birds, and shorebirds.

Analysis Area

The 20,277 acre analysis area is within the North Unit Diversion Dam-Deschutes River Watershed (18,948 acres) and Tumalo Creek Watershed (1,329 acres), Table 3-1. The project area includes 4,335 acres within the Northwest Forest Plan area, but no activities under any action alternative are proposed within that boundary.

Effects are discussed at the project area scale and the cumulative effects boundary for wildlife extends to the entire North Unit Diversion Dam watershed. The watershed scale was used for elk and mule deer because these species are wide ranging and the Forest Plan guidance directs analysis at larger scales for these species.

Analysis Methods

Potential impacts to wildlife species associated with this project are focused on the following six species groups.

1. U.S. Fish and Wildlife Service Proposed, Endangered, or Threatened terrestrial wildlife species and critical habitat.
2. USDA Forest Service Pacific Northwest Region 6 Sensitive Species.
3. Management Indicator Species as identified in the Deschutes National Forest Land and Resource Management Plan (USDA FS 1990).

4. Survey and Manage Species as identified in the 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (USDA FS 2001).
5. Migratory birds listed as Birds of Conservation Concern (USFWS 2008) list for Bird Conservation Region 9-Great Basin and focal species in the *Conservation Strategy for Landbirds of the East-slope of the Cascade Mountains in Oregon and Washington* (Altman 2000).
6. High priority shorebirds listed in the U.S. Shorebird Conservation Plan (2004).

Short-term impacts are expected to be those that occur in 1-5 years and long-term impacts are those beyond five years.

A distance of 200 meters (656 feet) was used for the analysis to described activities in the action alternatives that could influence or affect species. Modeled habitat within that buffer was used to determine species with potential to occur in the vicinity of proposed activities in the action alternatives and the relative impacts of the alternatives. This buffer does not indicate the amount of habitat to be directly impacted but represents habitats near the proposed routes where some species sensitive to disturbance may be indirectly affected by new trails. Some species have potential habitat in the larger project area but only species with habitat within the 200 meter buffer were carried forward for detailed analysis.

Key Issues and Wildlife

Key Issue 1: Managing for Recreation in a Key Elk Area

Key Indicator:

- Miles of non-motorized trail within the Ryan Ranch Key Elk Area.

Deschutes National Forest LRMP direction (WL-46) specifies road densities within Key Elk Areas but it does not specifically address non-motorized trails. To measure how recreation within the key elk area is managed the miles of non-motorized trails within the Ryan Ranch Key Elk Area will be used. There are currently 50.01 miles of designated non-motorized trail in the Ryan Ranch Key Elk Area. This includes the portion of the Sunriver to Lava Lands Visitor Center paved path that has not been constructed yet. Overall, non-motorized trail density is 1.49 mi/mi^2 in the key elk area. These trails are not evenly distributed across the Key Elk Area but are concentrated near the Deschutes River and east of FSR 41.

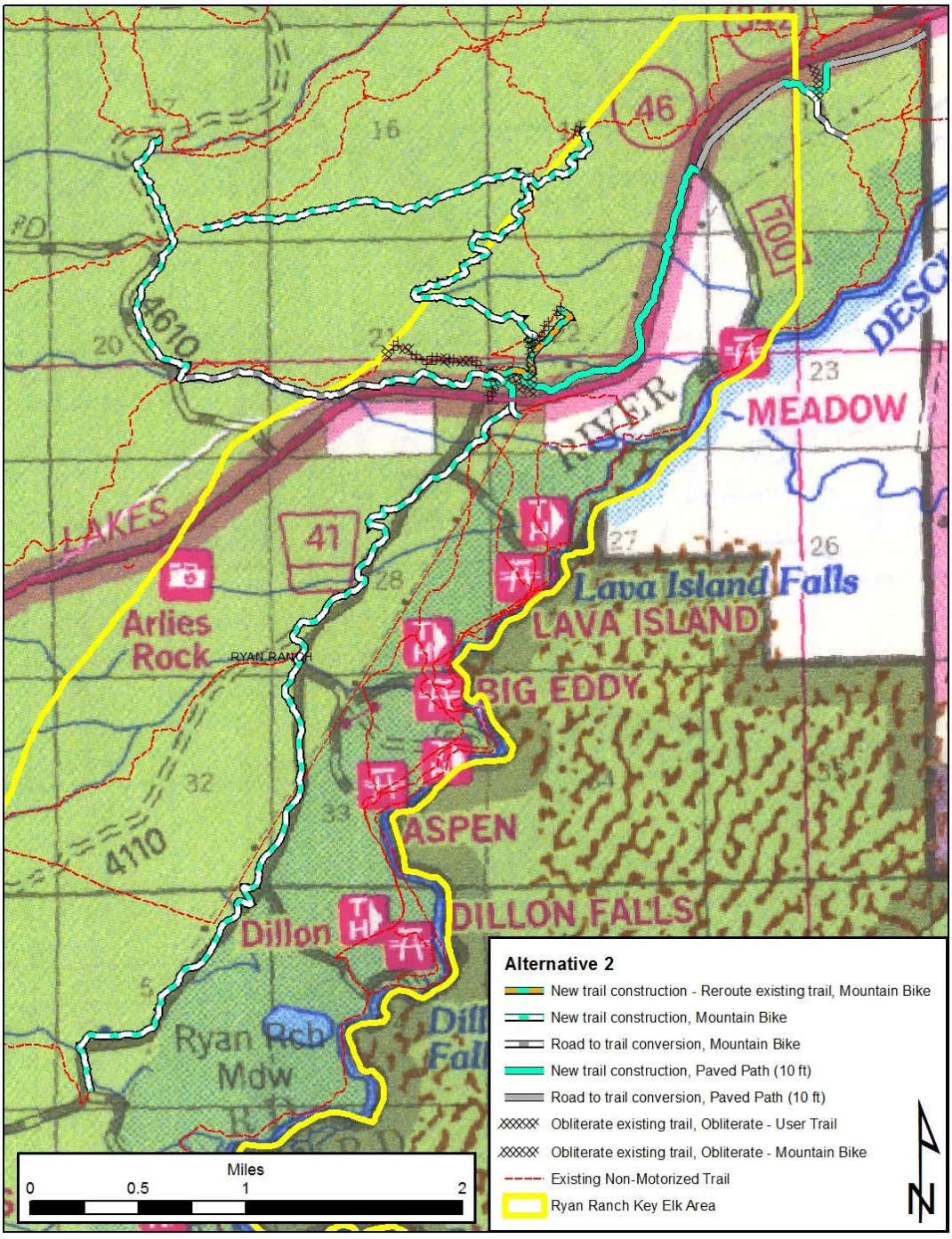

Figure 3-5: Alternative 2 trails within KEA

Alternative 2 would increase the amount of designated non-motorized trail in the KEA to 60.81 miles total. This includes the designation of 10.80 miles of new trail and the obliteration of 1.34 miles of exiting trails. Overall trail density in the Key Elk Area would be 1.77 mi/mi2 or an 18% increase above baseline.

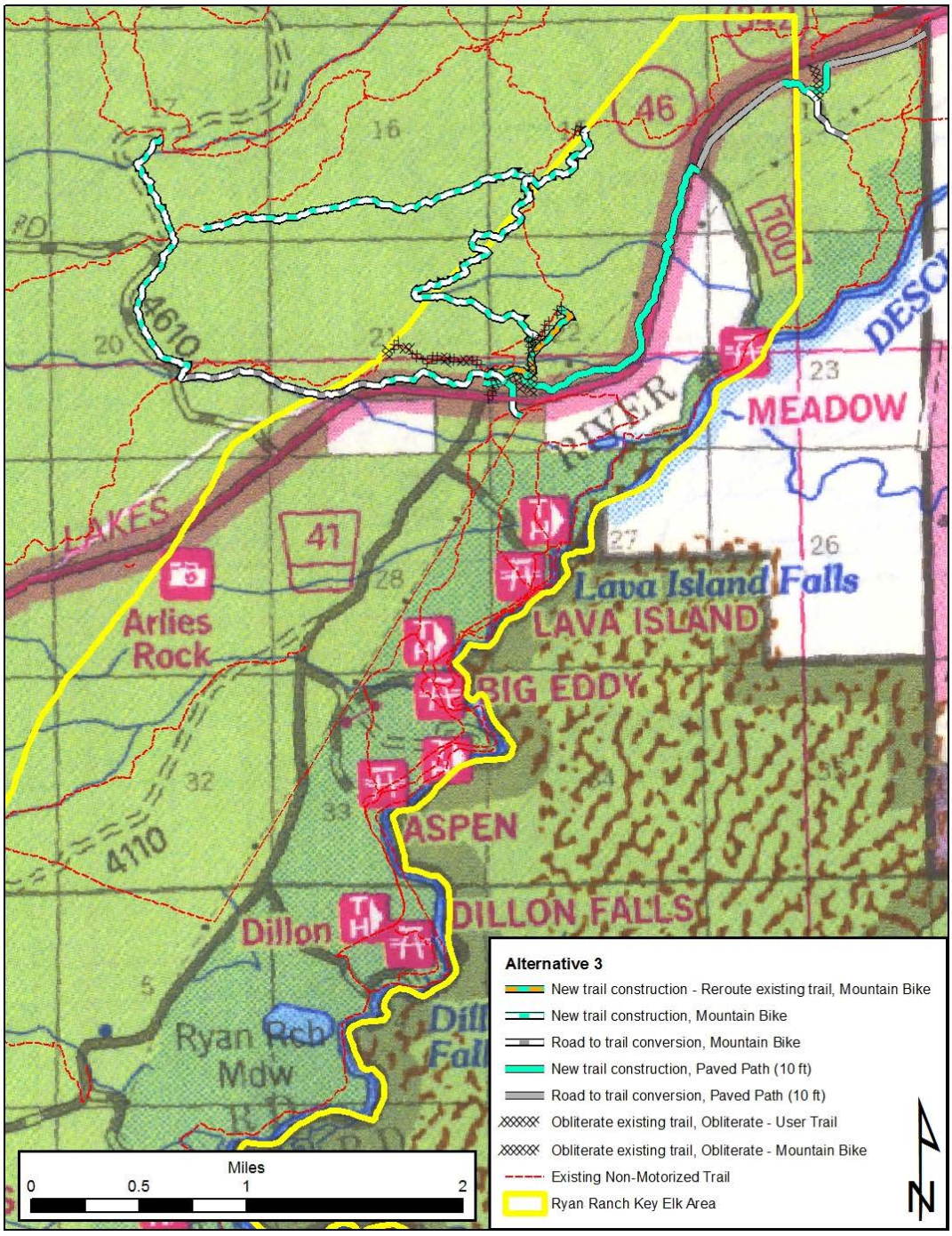

Figure 3-6: Alternative 3 trails within KEA

Alternative 3 would increase the amount of designated non-motorized trail in the KEA to 56.05 miles of designated non-motorized trails. This includes the designation of 6.04 miles of new trail and the obliteration of 1.34 miles of exiting trails. Overall trail density in the Key Elk Area would be 1.63 mi/mi^2 or a 9.4% increase above baseline. Alternative 3 proposes less trail miles in the KEA, less trail miles would have less of a potential for human disturbance to elk when compared to Alternative 2.

Additional effects discussion disclosing project effects on elk can be found below in the Forest Management Indicator Section.

Key Issue 2: Providing Parking for Existing Users and New Use of Trail 1A

Key Indicators:

- Number of parking spaces at the trailhead
- Square footage of parking area
- Number of accessible parking provided

Parking availability could impact wildlife through habitat conversion necessary to provide adequate and safe parking. Depending on how large the parking area is it is possible that the higher vehicle capacity could increase displacement of animals in the area as the number of visitors increase.

A 40 space parking lot is estimated at 0.68 acre with a 20 space lot estimated at 0.34 acre, but the disturbed area would be more than that for construction. Parking lot design for both action alternatives would result in a similar amount of habitat converted based on the size of each lot. The proposed location is adjacent to the existing parking area and wildlife in the area typically avoids this area because of consistent human use and close proximity to the highway.

Increased visitation is difficult to quantify potential impacts to wildlife. It is likely that current use levels already displace wildlife species that are sensitive to human presence. Increasing the lot size is expected to displace additional wildlife above the baseline but the overall impacts would be difficult to detect. The increased traffic would be most noticeable during the winter when big-game moves to lower elevations. The parking area is not in Deer Habitat (M7) or the Ryan Ranch Key Elk Area so there are no restrictions on non-motorized activities in the area.

Effects related to these two key issues are further discussed in the following sections and species that they apply too.

Wildlife Species Listed under the Endangered Species Act of 1973, as amended

The following table provides a list of Proposed, Endangered, or Threatened species or their designated critical habitat (listed by USFWS under ESA) with potential to occur on the Deschutes National Forest.

Table 3-5: Proposed, Endangered, Threatened Wildlife Species or Habitat Suspected on the Deschutes National Forest

Species or Habitat suspected on the Deschutes National Forest	Habitat
Gray Wolf	Wide ranging carnivore that uses a variety of habitats that support sufficient prey base
Northern Spotted Owl	Multi-story forested stands of mixed conifer with high canopy closure and large diameter trees
Northern Spotted Owl Designated Critical Habitat	Nesting roosting foraging and dispersal habitat within the range of the Northern spotted owl
North American Wolverine	Wide ranging carnivore found in high elevation alpine environments
Oregon Spotted Frog	Highly aquatic amphibian associated with open water wetlands

Species or Habitat suspected on the Deschutes National Forest	Habitat
Oregon Spotted Frog Potential Critical Habitat	Oregon spotted frog uses ephemeral or permanent bodies of fresh water, including but not limited to natural or manmade ponds, springs, lakes, slow moving streams, or pools within or oxbows adjacent to streams, canals and ditches

Existing Condition for Gray Wolf

The gray wolf has been listed as endangered since 1973 with the Western Great Lakes and Northern Rocky Mountain Distinct Population Segments currently delisted due to recovery. Gray wolves that occur in the western and central portions of Oregon are listed as Endangered, while wolves in the northeast portion of the state are not listed.

In 1999, a single female wolf from the Idaho experimental population moved into Oregon (ODFW 2013). Since then the Oregon wolf population has become established with a minimum population estimate of 46 individuals with six packs at the end of 2012 (ODFW 2013). Gray wolf populations in Oregon are concentrated in the Blue Mountains northeast of Interstate 84. In 2011, one gray wolf was documented on the Deschutes Forest. This individual moved through central Oregon and into northern California and returned to southern Oregon in March 2013. There have been no confirmed wolf observations on the Forest since 2011.

Gray wolves use a variety of forested habitats with interspersed river valleys and meadows for hunting. They prefer ungulate prey species such as pronghorn, deer and elk but would also take other mammals as available. Pack territories can exceed 400 square miles depending on the available habitat and prey resource. Key habitat components include sufficient year-round prey availability, suitable denning and rendezvous locations, and sufficient area without human exposure (USFWS 1987). Den sites are often underground burrows, but can also include hollow logs, rock caves or other secure locations.

A lack of confirmed observations indicates that wolves on the Forest are likely dispersing individuals from northeast Oregon and are not considered residents on the Forest. The project area includes some of the most popular recreation use areas on the Forest. With the high level of human presence gray wolfs are not expected in this area.

Effects Analysis for Gray Wolf

Direct and Indirect Effects – All Alternatives

Wolves are not known to regularly occur on the Forest and tend to avoid areas of continued human presence (such as the project area). Gray wolves are not expected to occur in the project area due to the lack of observations on the Forest and the high human presence in the project area. Therefore, there would be no direct or indirect effects to gray wolf.

Cumulative Effects – All Alternatives

Since there are no direct or indirect effects for any of the alternatives, there are no cumulative effects to gray wolf or habitat.

Determination

Implementation of any of the alternatives would have no effect on gray wolf because their presence on the Forest is infrequent and current recreation use would prevent wolves from occurring in the project area.

Existing Condition for Northern Spotted Owls

The northern spotted owl is listed as threatened under ESA. It was originally listed throughout its range, "due to loss and adverse modification of spotted owl habitat as a result of timber harvesting and exacerbated by catastrophic events such as fire, volcanic eruption, and wind storms" (USFWS 1990). Since the original listing action additional threats such as current habitat loss and competition from barred owls (Strix varia) have been identified (USFWS 2011).

This species is associated with structurally complex mature and old-growth forests. Suitable spotted owl habitat is categorized as nesting, roosting or foraging (NRF) or dispersal. Typical NRF habitat in the east Cascades is mature multi-storied stands of mixed conifer. Canopy cover is often 40% or higher with large diameter overstory trees (21 inches dbh or greater). Foraging habitat can have reduced canopy cover but nesting and roosting habitat also provides foraging habitat. Dispersal habitat is forested stands with a minimum 30% canopy closure and medium sized trees (11 inch dbh).

The western portion of the project area extends into established northern spotted owl range. There are 32 acres of potential NRF habitat in this portion of the project area. However, proposed trail and parking construction activities in the action alternatives are well outside of established northern spotted owl range. All of the proposed activities (both action alternatives) occur more than one mile from the established range of the owl and over two miles from any NRF habitat.

Effects Analysis for Northern Spotted Owls

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effect to northern spotted owls because no suitable habitat would be impacted since proposed activities would not occur.

Alternative 2 and Alternative 3

Proposed activities would not occur within one mile of mapped NRF habitat. There would be no alteration of existing northern spotted owl habitat or disturbance to individual owls associated with proposed activities.

Cumulative Effects – All Alternatives

Since there are no direct or indirect effects for any of the alternatives (either proposed activities would not occur or proposed activities are well outside of owl habitat), there are no cumulative effects to northern spotted or habitat.

Determination

Implementation of any of the alternatives would have no effect on northern spotted owl because no NRF or dispersal habitat would be affected by activities and no individual owls are near proposed trails.

Existing Condition for Northern Spotted Owl Critical Habitat

In 2008, lands within the range of the northern spotted owl were given critical habitat designations. On December 4, 2012, USFWS revised the previous critical habitat for the northern spotted owl across its range to better reflect the updated species recovery plan (USFWS 2011). This increased lands designated as critical habitat on the Forest to 253,243 acres.

Designated critical habitat is defined as the physical and biological features essential for conservation of the species. For the northern spotted owl optimal nesting and roosting habitat are described as multi-layered, multi-species forested stands with moderate to high canopy closure (60-80%) and large trees (30 inches dbh or more). Stands contain abundant large snags with high levels of down wood and an open understory. A variety of forest stands can provide foraging or dispersal habitat but ponderosa pine stands are generally avoided as foraging habitat (USFWS 2012).

There are 2,503 acres of designated critical habitat in the eastern portion of the project area concentrated south of the Cascade Lakes Highway and west of the currently established northern spotted owl range boundary. This critical habitat provides north-south connectivity among spotted owl habitat patches in the eastern Cascades of Oregon. None of the activities proposed in the action alternatives would occur within one mile of designated northern spotted owl critical habitat.

Effects Analysis for Northern Spotted Owl Critical Habitat

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effect to northern spotted owls critical habitat.

Alternative 2 and Alternative 3

Proposed activities would occur over one mile from areas mapped as designated critical habitat in the 2012 designation. The action alternatives would not directly or indirectly effect designated critical habitat for northern spotted owl.

Cumulative Effects – All Alternatives

Since there are no direct or indirect effects for any of the alternatives (either proposed activities would not occur or proposed activities are well outside of designated critical habitat), there are no cumulative effects to northern spotted owl critical habitat.

Determination

Implementation of any of the alternatives would have no effect on designated critical habitat for northern spotted owl. Proposed activities would not occur in designated critical habitat for northern spotted owl and critical habitat for this species would not be altered.

Existing Condition for North American Wolverine

The North American wolverine was recently proposed for listing under ESA as threatened (USFWS 2013c). The species was previously identified as a Candidate for listing under ESA and is listed as a

R6 Sensitive Species. The wolverine is also Forest management indicator species (MIS) chosen to represent species found in the alpine and subalpine habitat types. Home range size for females is 60 square miles and for males up to 540 square miles. Wolverine consume most any available prey or dead animal.

Historic observations of wolverine in the Cascades of central Oregon have been documented between 1963 to 1973. There have been no confirmed individuals on the Forest since 1965. The species has recently been documented in northeast Oregon. There is potential habitat for wolverines in central Oregon but wolverines are not considered to occur on the Forest because of the lack of observations. There is no mapped wolverine denning habitat in the project area.

Effects Analysis for North American Wolverine

Direct and Indirect Effects – All Alternatives

Wolverine habitat is not present in the project area and this species is not considered to regularly occur on the Forest. The alternatives, including the no action alternative, would have no direct or indirect effect on this species or their habitat.

Cumulative Effects – All Alternatives

Since there are no direct or indirect effects for any of the alternatives, there are no cumulative effects to wolverine or habitat.

Determination

Implementation of any of the alternatives would have no effect on North American wolverine because habitat would not be affected and the species is not expected to regularly occur on the Forest.

Existing Condition for Oregon Spotted Frog

On August 29, 2013, a proposed rule to list the Oregon spotted frog as threatened was published. This species previously was identified as a candidate for listing but now is being classified as proposed for listing.

This species is aquatic and inhabits the margins of lakes, marshes, and pools in streams where there is an abundant growth of vegetation (USFWS 2013a). Cushman and Pearl (2007) describe spotted frog breeding habitat as moderate to large wetlands with extensive emergent marsh coverage that warms substantially during seasons when Oregon spotted frogs are active on the surface (February to May). Sites always include some permanent water compared to seasonally inundated habitat.

There are Oregon spotted frog observations in the project area but these are adjacent to the Deschutes River and proposed activities do not occur over 0.5 miles from observations.

Effects Analysis for Oregon Spotted Frog

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effect to Oregon spotted frog or habitat.

Alternative 2 and Alternative 3

Project activities are over 0.5 miles away from potential habitat. The action alternatives would not disturb habitat and would not result in direct or indirect impacts to spotted frog.

Cumulative Effects – All Alternatives

Since there are no direct or indirect effects for any of the alternatives, including the no action alternative, there are no cumulative effects to Oregon spotted frogs or habitat.

Determination

Implementation of any of the alternatives would have no effect on the Oregon spotted frog because no habitat would be altered by activities and no individuals would be near project activities.

Existing Condition for Oregon Spotted Frog Proposed Critical Habitat

Critical habitat for Oregon spotted frog was concurrently (USFWS 2013b) proposed with the proposal to change the species status to threatened. Critical habitat within the project area include subunit 8A (Upper Deschutes River below Wickiup Dam).

The project area includes a portion of proposed critical habitat on the eastern boundary associated with the Deschutes River. None of the proposed activities in either action alternative would occur within areas proposed as critical habitat for the Oregon spotted frog.

Effects Analysis for Oregon Spotted Frog

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effect to Oregon spotted frog proposed critical habitat.

Alternative 2 and Alternative 3

Project activities would not occur in proposed critical habitat. The action alternatives would not disturb habitat and would not result in direct or indirect impacts to spotted frog proposed critical habitat.

Cumulative Effects – All Alternatives

Since there are no direct or indirect effects for any of the alternatives, including the no action alternative, there are no cumulative effects to Oregon spotted frogs proposed critical habitat.

Determination

Implementation of any of the alternatives would have no effect on proposed critical habitat for spotted frog because none of the proposed trails cross aquatic habitat and none are near proposed critical habitat.

Region 6 Sensitive Wildlife Species

The following table lists Region 6 Sensitive Species that are either documented or suspected on the Deschutes National Forest. Species in bold have habitat or are known to occur in the project area and are discussed in detail below. The Oregon spotted frog is a Region 6 sensitive species but is discussed in the section above.

Table 3-6: Region 6 Sensitive Species documented or suspected on the Deschutes National Forest

Region 6 Sensitive Species	Habitat
Townsend's big-eared bat	**Caves and manmade structures**
Pallid bat	Caves
Spotted bat	Sheer cliffs and caves
Fringed myotis	**Caves, abandoned mines and large snags**
Pacific fisher	Mixed conifer with complex structure
Bald eagle	**Mature trees/snags near lakes, rivers**
American peregrine falcon	Cliffs and riparian areas
Lewis' woodpecker	**Mature ponderosa pine or burned areas**
White-headed woodpecker	**Large, open ponderosa pine**
Bufflehead	Lakes with snags
Harlequin duck	Rapid streams with large trees
Tule white-fronted goose	Marshes and wetlands
Horned grebe	Lakes
Tricolored blackbird	Bulrush patches in marshes and lakes
Yellow rail	Marshes
Northern waterthrush	Shrubby riparian areas with willow/alder
Greater sage-grouse	Sagebrush
Oregon spotted frog	**Streams/marshes with consistent water**
Bufflehead	Streams and marshes
Harlequin duck	Perennial wet riparian areas
Tule white-fronted goose	Perennial wet riparian areas
Horned grebe	Open riparian bogs and marshes

Region 6 Sensitive Species	Habitat
Tricolored blackbird	Mature conifer forest with mistletoe
Yellow rail	Meadows

Existing Condition for Townsend's Big-eared Bat

This is a non-migratory bat that uses caves, mines or abandoned buildings for larger roosts. Solitary bats use can use rock crevices, fissures, buildings, bridges and large trees as day or night roost sites. There are approximately 350 caves on the Forest and approximately 10 to 15% of these caves could support maternity or wintering colonies.

Bats typically use four different roost types. Day roosts can include caves, rock crevices, bridges, buildings and large snags that are used by individuals for extended periods during daylight. Night roosts can be any structure that provides a resting place for bats between foraging activity at night. Maternity roosts are often secure areas (e.g. caves or buildings) with stable temperature and humidity where females gather for birth and caring of young. Hibernacula (wintering areas) can be occupied by males and females and are often larger caves with stable temperature and humidity to optimize hibernation efficiency. Maternity colonies and hibernacula are the most important roost types for bat populations because these are often larger concentrations of individuals and quality roost locations tend to be rare on the landscape.

Human activity near sensitive roost locations (hibernacula or maternity colonies) is the primary disturbance factor to this species (Pierson et al. 1999). Recreation activities can impact Townsend's big-eared bats if they increase human disturbance to sensitive roosts or remove potential roost trees. Other disturbance factors include loss of foraging and roosting habitat through vegetation management practices.

White-nose syndrome is affecting many bat species in the eastern United States, the fugus has been recorded in western Oklahoma. There are no known cases in Oregon. The fungus interrupts hibernating bats resulting in over-expenditure of fat reserves needed to hibernate.

There is one known cave in the project area and no Townsend's big-eared bats have been observed in that cave. It is over 2 miles away from proposed activities. The nearest documented Townsend's big-eared bats occur at Lava River Cave, which is approximately 5 miles southeast of proposed activities and outside of the project area but within the watershed. Larger rock outcrops in the northern portion of the project area could provide day or night roosting habitat, but would not support maternity colonies or hibernacula because they are too shallow to provide consistent temperatures. These outcrops are a popular rock climbing area and the consistent human presence precludes regular use by bats. Since there are documented Townsend's big-eared bats in the watershed and potential habitat in the project area it is likely that some roosting and foraging occurs in the area, but the lack of larger caves or abandoned buildings suggests that roosting is limited to individuals using large trees or rock crevices as day or night roosts.

Effects Analysis for Townsend's Big-eared Bat

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects to this species. Existing habitat would remain as is. Cave resources would remain as currently managed and human visitation is not expected to increase. Climbing in the northern portion of the project area would continue at current use levels. Human presence would preclude regular bat use of these rock outcroppings.

Alternative 2

Alternative 2 is not expected to directly or indirectly impact Townsend's big-eared bats. Large trees and snags are not proposed to be removed during trail construction activities, unless they present a safety hazard. Alternative 2 is not expected to increase use of the rock climbing area and it is expected that use would continue at existing levels. The only cave in the project area is far enough away from proposed trails that human visitation is not expected to increase. Since this species does not regularly roost in trees it is unlikely that trail construction activities would disturb individuals. Some trail relocations would occur near the rock outcrops but this is not expected to impact Townsend's big-eared bats as the trail would not be moved into the rock face but above it.

Alternative 3

Direct and indirect impacts for Alternative 3 are the same as Alternative 2 with no direct or indirect impacts expected. The reduction in parking lot size from 40 to 22 spaces does not change potential impacts to the species.

Cumulative Effects – All Alternatives

Since there are no direct or indirect effects for any of the alternatives, including the no action alternative, there are no cumulative effects to Townsend's big-eared bat or habitat.

Determination

Implementation of any of the alternatives would have no impact on Townsend's big-eared bat. Existing habitat conditions would remain and proposed activities would not remove snags or large trees that could provide day or night roosts.

Existing Condition for Fringed Myotis

Caves and abandoned mines are suitable maternity and hibernacula (wintering areas) for fringed myotis as these sites maintain appropriate humidity and temperature conditions. Large trees, bridges and rock crevices can provide day and night roosts. Of the four sensitive bat species on the Region 6 list the fringed myotis is most likely to use large trees for roosts. Seasonal migration patterns for fringed myotis are poorly understood, but short-range migrations are likely based on the species wing shape (Keinath 2004).

Foraging activity typically begins 30 minutes after sunset with suspension of foraging during the middle of the night. There is another brief foraging period prior to sunrise. Wetlands, riparian zones and areas with high insect concentrations provide quality foraging habitat. Fringed myotis are prey generalists that consume a variety of insects (Keinath 2004).

The primary threat to fringed myotis is roost loss through abandoned mine closures and persistent roost disturbance from recreational caving. Other threats include loss of roosting habitat through timber management practices, prey reductions through the use of pesticides and white-nose

syndrome. This species occurs outside of the range of where white-nose syndrom has been documented.

There are no fringed myotis observations in the project area and potential habitat is similar to that described under the Townsend's big-eared bat. This species would be more likely to roost in large trees than Townsend's big-eared bat.

Effects Analysis for Fringed Myotis

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects to this species. Existing roosting habitat and availability of cave and rock crevice resources would remain as is. Climbing in the northern portion of the project area would continue at current use levels.

Alternative 2

Alternative 2 is not expected to directly or indirectly impact fringed myotis. Large trees and snags are not proposed to be removed during trail construction activities, unless they represent a safety hazard. Alternative 2 is not expected to increase use of the rock climbing area and it is expected that use would continue at existing levels. The only cave in the project area is far enough away from proposed trails that human visitation is not expected to increase. Some trail relocations would occur near the rock outcrops but this is not expected to impact fringed myotis as the trail would not be moved into the rock face but above it.

Alternative 3

Direct and indirect impacts for Alternative 3 are the same as Alternative 2 with no direct or indirect impacts expected. The reduction in parking lot size from 40 to 22 spaces does not change potential impacts to the species.

Cumulative Effects – All Alternatives

Since there are no direct or indirect effects for any of the alternatives, including the no action alternative, there are no cumulative effects to fringed myotis or habitat.

Determination

Implementation of any of the alternatives would have no impact on fringed myotis. Existing habitat conditions would remain and the proposed activities would not remove snags or large trees that could provide day or night roosts.

Existing Condition for Bald Eagle

The bald eagle primarily nests in forested areas near the ocean, along rivers, and at estuaries, lakes, and reservoirs (Isaacs and Anthony 2001). Anthony and Isaacs (1989) found that 84% of Oregon nests were within 1 mile of water. Nests are usually built in one of the largest live trees or snags in the stand, consist of bulky stick platforms, and are typically in stands with open canopies. Nests are also, but rarely, built on cliff faces or on the ground in treeless areas (Buehler 2000). The size of the

forest stand in which the nest tree is located may be unimportant if the area is isolated from human disturbance (Marshal et al. 2003). A lack of human disturbance is important for successful hunting (McGarigal et al. 1991), feeding of young (Steidl and Anthony 2000), and nesting (Anthony and Isaacs 1989). Eagles choose sites more than 0.75 miles from low-density human disturbance and more than 1.2 miles from medium-to-high-density human disturbance (Peterson 1986).

On the Deschutes National Forest, ponderosa pine and Douglas-fir trees averaging ≥32 inches dbh with live large, open limb structure are preferred for nesting. Other tree species used for nesting include white fir, red fir, grand fir, incense-cedar, Oregon white oak, quaking aspen, and willow (Marshal et al. 2003). Large old trees have large limbs and open structure for eagle access and nest support, and provide a view of the surrounding territory. Marshall et al. (2003) notes that of 870 nests, 98.9% were built in live trees, but eagles would continue to use the same nest after the tree dies.

Timber harvest activities near breeding or winter grounds can remove nests, roost or perch trees. These activities could disturb breeding or wintering birds if they occur near nest sites. Recreational activities that concentrate human presence near nests or winter roosts can disturb resident birds depending on the distance from the activity to the nest.

Bald eagle use in the project area is considered incidental and primarily during the fall and winter months. There are no documented nests or winter roosts in the project area and no Bald Eagle Management Areas as identified by the Forest Plan. There are a total of 11,335 acres of suitable bald eagle habitat in the North Unit Diversion Dam-Deschutes River watershed or 7% of the 155,006 total acres of habitat forest-wide.

Within 200 meters (approximately 650 feet) for the proposed trails in Alternative 2 there is approximately 1,000 acres of potential bald eagle habitat and 408 acres in Alternative 3.

Effects Analysis for Bald Eagle

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects to this species. Bald eagle habitat would remain as is and existing recreation use would continue.

Alternative 2 and Alternative 3

The available bald eagle habitat in the project area is associated with the Deschutes River. Modeled potential habitat is primarily near Trails 1 and 2. Project activities would not remove large green trees or snags that could provide nest, roost or perch trees for eagles in the future. Predicted bald eagle habitat near the proposed trails provides suitable tree structure but because of the current recreation use it lacks the solitude that this species tends to prefer. Implementation of this alternative would have no direct or indirect impacts to bald eagle because there are no bald eagle nests in the project area and potential habitat would remain as large trees and snags are retained.

Cumulative Effects – All Alternatives

Since there are no direct or indirect effects for any of the alternatives, including the no action alternative, there are no cumulative effects to bald eagles or habitat.

Determination

Implementation of any of the alternatives would have no impact on bald eagle. The project area has bald eagle habitat but no documented nests or winter use. While the available habitat provides the structural requirement for bald eagle the consistent human use does not provide the seclusion this species usually prefers. Trail construction is in upland habitats and does not remove any potential nest or roost trees for eagles.

Existing Condition for Lewis' Woodpecker

This woodpecker is associated with mature ponderosa pine, riparian cottonwoods, and recently burned areas of any forest type (Able et al. 2004). Recent wildfires provide snags, perch sites and abundant insects to support nesting. The Lewis' woodpecker is considered a weak excavator and depends on large snags in advanced decay or cavities created by stronger excavators. This species was chosen as an MIS as part of the woodpecker group and a focal species for ponderosa pine with patches of burned forest in the East Cascade Landbird Strategy (Altman 2000).

There are approximately 84,978 acres of potential Lewis' woodpecker nesting habitat across the Forest. The eastern portion of the project area is part of an ongoing Lewis woodpecker nest box utilization project that began in 2003 (Kook and Moodie 2009). There are 25 nest boxes in the project area. Annual monitoring indicates that a high percentage (72%) of the boxes are used each year with 18 of 25 used in 2011. Eleven of these nest boxes are within 200 meters of the proposed paved path location for both action alternatives. Resource protection measure (Ch. 2.6.1 WL-RPM #2) places a timing limitation on construction of the portion of Trail 1 between the trailhead parking area east to the forest boundary from April 15 to August 15 because of Lewis woodpecker nest boxes near the trail.

Table 3-7 Lewis's woodpecker habitat by watershed and subwatershed in the project area

Watershed	Subwatershed	Forest Service Acres in Subwatershed	Nesting Habitat Acres	Percent of Subwatershed with Nesting Habitat
North Unit Diversion Dam-Deschutes River	**Lava Island Falls – Deschutes River**	12,518	5,581	5
	Overturf Butte – Deschutes River	31,374	5,640	5
	Benham Falls – Deschutes River	22,663	7,728	7
Tumalo Creek	**Lower Tumalo Creek**	17,238	1,329	14

Modeled Lewis' woodpecker habitat within 200 meters (approximately 650 feet) of proposed trails was mapped. The majority of potential habitat is along Trail 2. There are approximately 345 acres of potential habitat near Alternative 2 trails and 90 acres of habitat near Alternative 3 trails.

Effects Analysis for Lewis' Woodpecker

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects to this species. Current Lewis' woodpecker habitat would remain as is and existing nest boxes in the eastern portion of the project area would remain available for ongoing and future nesting.

Alternative 2

Lewis' woodpecker nest boxes are near Trail 1 and construction activities may directly affect this species. A resource protection measure (Ch. 2.6.1, WL-RPM-2) placing a timing limitation on construction activities between April 15 to August 15 would protect nesting Lewis' woodpeckers and reduce potential impacts to the species. This species is not known to be sensitive to human disturbance farther than 15 meters (approximately 50 feet) from a nest but prolonged construction activities could lead to nest abandonment. Another resource protection measure (Ch. 2.6.1, WL-RPM-1) would retain all snags unless removal was necessary for a human health and safety reason. No snags of this type have been identified and the potential removal of trees that provide habitat for this species is low. This would not noticeably change the availability of nesting or foraging habitat at the watershed or subwatershed scale.

Alternative 3

Direct and impacts from Alternative 3 are very similar to Alternative 2. Alternative 3 has fewer miles of trail within or near modeled Lewis' woodpecker habitat than Alternative 2 but potential impacts to the artificial nest boxes are common to both alternatives.

Cumulative Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects; therefore, there would be no cumulative effects to Lewis' woodpecker from this alternative.

Alternative 2 and Alternative 3

The West Bend Vegetation Management project could have an impact on this species. Vegetation treatments in the West Bend area may treat between approximately 3,000 to 4,000 acres of potential Lewis' woodpecker habitat with the intent of reducing smaller diameter material and promoting older ponderosa pine stands that provide future Lewis' woodpecker habitat. West Bend project proposes treatment units along all sections of the proposed trails this along with proposed activities would have a short-term impact (construction disturbance from proposed trails and mechanical disturbance from vegetation management practices) but would provide long-term benefit for the species (West Bend Final Environmental Impact Statement).

The primary past and current vegetation management projects in the project area include the East Tumbull HFRA project and the Katalo East and West project. East Tumbull proposed 5,769 acres of commercial thinning and fuels reduction in the project area while Katalo East and West combine for 8,857 acres of commercial thinning and fuels reduction in the project area. Understory thinning occurred in both these projects and that action is expected to improve Lewis' woodpecker habitat over the long-term. Tree removal is complete for these projects but some fuels treatments remain. Potential impact to Lewis' woodpecker from these projects is related to implementation of fuels treatment units. Not all of the proposed units are expected to be completed and prescribed fire

activities tend to occur outside of the breeding season for this species. These past projects have likely benefitted Lewis' woodpecker habitat over the long-term and proposed activities would not remove any woodpecker habitat, suitable habitat, overtime, would increase.

Vegetation management and fuels reduction activities (West Bend and Katalo) could overlap the implementation of the Welcome Station Connections project. The combined disturbance could displace individual Lewis' woodpecker but the timing limitations in both projects should reduce potential impacts. This project does not modify large portions of Lewis' woodpecker habitat so it would not contribute noticeable cumulative impacts to Lewis' woodpecker.

The project area is one of the most popular recreation areas on the Forest. This species is known to be tolerant of human presence near nests. Considering the nest success of artificial boxes along the existing road that would be converted to Trail 1 the ongoing and proposed recreation activities are not reducing the species ability to successfully nest in the project area. It is assumed that some level of nest disturbance does occur where human presence does get too close to nest boxes and where individuals occur near trails. Improving Trail 1 to a paved surface would increase disturbance above current levels. The potential increase in disturbance and traffic is not expected to create a detectable increase in cumulative impacts.

Determination

Implementation of Alternative 1 would have no impact on Lewis' woodpecker as the currently available habitat would remain and the existing recreation levels in the area are expected to occur at similar levels in the near future.

Implementation of Alterative 2 or Alternative 3 may adversely impact individuals, but not likely to contribute a trend toward federal listing or loss of viability to the population or species. There is limited potential for individual Lewis woodpecker to lose potential nesting or foraging opportunities if individual snags are removed for health or human safety reasons. While this species is not known to be sensitive to human disturbance there is possibility that recreation activities could disturb individual nests if appropriate distances are not maintained. Described impacts are expected to be infrequent based on the lack of snags in the area and that existing nest boxes are exposed to recreation activities already.

Existing Condition for White-headed Woodpecker

This species is associated with old-growth ponderosa pine habitats with reduced understory shrub component. The mean diameter of all ponderosa pine trees was 12.9 inches dbh with a ranged from 10 to 19.7 inches dbh in nest stands while the mean snag diameter in nest stands was 10 inches with a range from 6 to 12 inches dbh (Kozma 2011).

White-headed woodpecker nesting habitat was mapped using ponderosa pine dominated forests and a minimum stand size of 10 inch dbh. The Forest contains approximately 198,330 acres of white-headed woodpecker nesting habitat. The North Unit Diversion Dam watershed has 14,935 acres of potential white-headed woodpecker habitat approximately 8% of the watershed. The Tumalo Creek watershed has 3,384 acres of potential white-headed woodpecker habitat approximately 2% of the watershed. There is one documented white-headed woodpecker observation in the project area but no nests have been identified.

Modeled white-headed woodpecker habitat within 200 meters (approximately 650 feet) of proposed trails was mapped. There are approximately 850 acres of potential habitat near Alternative 2 trails and 382 acres of habitat near Alternative 3 trails.

Effects Analysis for White-headed Woodpecker

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects to this species. Current habitat would remain as is and existing recreation levels are expected to be similar into the near future.

Alternative 2

There are no known white-headed woodpecker nests in the project area and observations are infrequent. Predicted habitat modeling shows potential white-headed woodpecker reproductive habitat adjacent to most of the proposed trails with concentrations near Trail 2. Snags would not be removed (Ch. 2.6.1, WL-RPM-1) unless necessary for safety reasons. The likelihood of snags needing to be removed for safety reasons is expected to be infrequent given the existing snag levels along the trails is very low. This species is known to be somewhat tolerant to human presence near nests unless the nest cavity is disturbed. Potential impacts to the species could occur during trail construction if currently undiscovered nests occur near the trails. Ongoing use of the trails could displace individuals if nesting areas are very near the trails. Potential impacts to the species are expected to be infrequent as snags are not going to be regularly removed and the species is not known to regularly occur in the project area.

Alternative 3

Direct and indirect impacts to this species under this alternative are similar to Alternative 2. White-headed woodpecker habitat that is near Trail 2 is not present in this alternative so the potential for white-headed woodpeckers to be impacted by this alternative is reduced but not removed.

Cumulative Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects; therefore, there would be no cumulative effects to white-headed woodpecker from this alternative.

Alternative 2 and Alternative 3

The West Bend Vegetation Management Project proposes treatment of between 7,500 and 7,800 acres of potential white-headed woodpecker reproductive habitat. Impacts are similar to the Lewis' woodpecker in that this project along with proposed activities would have short-term impacts (construction disturbance from proposed trails and mechanical disturbance from vegetation management practices). West Bend vegetation treatments are expected to promote larger ponderosa pine structure, while activities under the action alternatives would not remove habitat, these activities would improve overall habitat conditions in the long-term for white-headed woodpeckers.

The primary past and current vegetation management projects in the project area include the East Tumbull HFRA project and the Katalo East and West project. East Tumbull proposed 5,769 acres of commercial thinning and fuels reduction in the Project Area while Katalo East and West combine for 8,857 acres of commercial thinning and fuels reduction in the project area. Understory thinning occurred in both these projects and that action is expected to improve white-headed woodpecker habitat over the long-term. Tree removal is complete for these projects but some fuels treatments remain. Not all of the proposed units are expected to be completed and prescribed fire activities tend

to occur outside of the breeding season for this species. These past and ongoing projects have likely benefitted white-headed woodpecker habitat over the long-term and proposed activities would not remove any woodpecker habitat, suitable habitat, overtime, would continue to improve.

Vegetation management and fuels reduction activities (West Bend and Katalo) could overlap the implementation of the Welcome Station Connections project. The combined disturbance could displace individual white-headed woodpeckers but this project does not modify large portions of potential habitat so it is not expected to contribute noticeable cumulative impacts to white-headed woodpecker.

Determination

Implementation of Alternative 1 would have no impact as currently available white-headed woodpecker habitat would remain at current levels.

Implementation of Alternative 2 or Alternative 3 may adversely impact individuals, but not likely to contribute to a trend toward federal listing or loss of viability to the population or species. There are no known white-headed woodpecker nests in the project area but suitable habitat does exist. There is potential that removal of individual snags for safety reasons could remove some nesting or foraging habitat for white-headed woodpeckers.

Forest Plan Management Indicator Species

The Forest Plan identified certain wildlife species as management indicator species. These species were selected because they represent other species with similar habitat requirements. Management indicator species are used to assess the impacts of management activities for a wide range of wildlife species with similar habitat needs (FSM 2620.5).

The Ochoco and Deschutes Viable Ecosystems Management Guide was developed to classify vegetation on a landscape basis. "The Viable Ecosystem model provides a process to apply ecosystem management concepts to project level planning. This system compares existing vegetation with site potential. The model focuses on relationships between combinations of vegetation structure and species composition, and habitat requirements for animals, insects, and plants. Viable Ecosystems is a useful tool for cumulative effects analysis of broad-scale changes in vegetation at a subwatershed to Forest-wide scale and subsequent changes in animal, insect, or plant communities." The 2004 satellite imagery layer was used to develop the map.

Forest-wide assessment for MIS was completed for the Deschutes National Forest (USFS 2012). Suitable habitat for each species was defined as areas that could potentially be support reproduction, but also included habitat related to species specific direction in the Forest Plan. An assessment was completed for each species based on the amount of potentially suitable habitat that occurs across the Forest, associated threats, and population trend data where it was available. The assessment used the best available science and guidance such as research found in books, scientific journals, and scientific websites. Habitat definitions were developed and suitable reproductive habitat models were generated for each MIS species.

The WildHab model is used to describe potential impacts to the viability of management indicator species across the Forest. While a project may have localized impacts to MIS habitat at the project level this may not noticeably reduce the habitat available when compared to the entire forest. Multiple species are analyzed as MIS and under other categories such as threatened or sensitive. Analysis under the MIS section focuses on the forest-wide availability of habitat while other sections focus on impacts to individuals.

A 200 meter buffer (approximately 650 feet) was created for all described activities in the action alternatives. Modeled habitat within that buffer was used to determine species with potential to occur near proposed activities and the relative impacts of the alternatives. This buffer does not indicate the amount of habitat to be directly impacted but represents habitats near the proposed routes where some species sensitive to disturbance may be indirectly affected. The following table identifies all MIS listed in the Forest Plan. Some species have potential habitat in the larger project area but only species with habitat within the 200 meter buffer were carried forward for detailed analysis.

Snags and down logs are also listed as MIS. Detailed analysis for snags and down logs is not carried forward because proposed activities do not identify removal of this resource. A resource protection measure (Ch. 2.6.1, WL-RMP-1) identifies removal of snags only for reasons of health and human safety. Field reconnaissance of the trails did not identify snags that meet this description but if hazard trees develop prior to construction, some might be removed. There is a very low probability of this situation so the removal of snags is expected to be very infrequent and would not reduce snag availability at the subwatershed level.

Table 3-8 Management Indicator Species for the Deschutes National Forest

Species	NatureServe Ranking	Habitat Present in the Welcome Station Trails Project Area
Bald eagle*	**S4 Apparently secure**	**Large trees near lakes, rivers and estuaries.**
Northern goshawk	**S3 Vulnerable**	**Mature stands with high canopy closure/large trees.**
Cooper's hawk	**S4 Apparently secure**	**Stands with high canopy closures and tree density.**
Sharp-shinned hawk	**S4 Apparently secure**	**Stands with high canopy closures and tree density.**
Great gray owl	**S3 Vulnerable**	**Mature to old-growth stands near natural openings.**
Great blue heron	**S4 Apparently secure**	**Riparian edges near lakes, streams or marshes.**
Golden eagle	S4 Apparently secure	Large open areas with cliffs or rock outcrops.
Red-tailed hawk	**S5 Secure**	**Large snags and open country interspersed with forest.**
Osprey	**S4 Apparently secure**	**Large snags associated with fish bearing water bodies.**
American marten	S3 Vulnerable	Mixed conifer or high elevation late-successional forests with abundant down woody material.
Elk	**S5 Secure**	**Wide range of seasonal habitats.**
Mule deer	**S5 Secure**	**Wide range of seasonal habitats.**
Snags/down wood		Snags and down woody material.
Waterfowl		
Common loon	SHB Possibly extirpated breeding S5N Secure non-breeding	Edges of remote freshwater ponds and lakes.
Pied-billed grebe	S5 Secure	Edges of lakes, ponds, slow rivers and marshes.
Horned grebe	S2B Imperiled breeding, S5N Secure non-breeding	Open water with emergent vegetation.

Species	NatureServe Ranking	Habitat Present in the Welcome Station Trails Project Area
Red-necked grebe	S1B Critically imperiled breeding S4N Secure non-breeding	Lakes and ponds in forested areas.
Eared grebe	S4 Apparently secure	Open water with emergent vegetation.
Western grebe	S3B Vulnerable breeding S2S3N Imperiled/vulnerable nonbreeding	Open water marshes with emergent vegetation.
Canada goose	S5 Secure	Lakeshore, rivers and reservoirs especially with cattail
Wood duck	S4 Apparently secure	Cavity nester near perennial water bodies
Gadwall	S5 Secure	Clumps of grasses in meadows or tall grasslands
American widgeon	S5 Secure	Clumps of grasses in meadows or tall grasslands
Mallard	S5 Secure	Open water with emergent vegetation
Blue-winged teal	S4 Apparently secure	Marshes, lakes, ponds or slow moving streams
Cinnamon teal	S5 Secure	Shoreline vegetation
Northern shoveler	S5 Secure	Grassy areas near freshwater
Northern pintail	S5 Secure	Open areas near water
Green-winged teal	S5 Secure	Freshwater marshes with emergent vegetation
Canvasback	S4 Apparently secure	Emergent vegetation
Redhead	S4 Apparently secure	Freshwater marshes with emergent vegetation
Ring-necked duck	S3 Vulnerable	Thick emergent vegetation near shorelines
Lesser scaup	S3B Vulnerable breeding S4N Secure non-breeding	Dry grassy areas near lakes at least 10 feet deep
Harlequin duck	S2B Imperiled breeding S3N Vulnerable non-breeding	Fast moving streams at higher elevations

Species	NatureServe Ranking	Habitat Present in the Welcome Station Trails Project Area
Common goldeneye	S4 Apparently secure	Cavity nester
Barrow's goldeneye	S3B Vulnerable breeding S3N Vulnerable non-breeding	Cavity nester
Hooded merganser	S4 Apparently secure	Cavity nester
Common merganser	S4 Apparently secure	Cavity nester
Ruddy duck	S4 Apparently secure	Freshwater marshes and lakes with dense vegetation
Woodpeckers		
Williamson's sapsucker	S4B Apparently secure breeding S3N Vulnerable non-breeding	Mature conifer forests with open canopy.
Red-naped sapsucker	S4 Apparently secure	Riparian hardwood forest.
Lewis' woodpecker	S2S3 Imperiled/Vulnerable	Open mature ponderosa pine and recent burn areas.
Downy woodpecker	S4 Apparently secure	Riparian hardwood forest.
Hairy woodpecker	S4 Apparently secure	Mixed conifer and ponderosa pine forests.
Three-toed woodpecker	S3 Vulnerable	High elevation lodgepole pine forests.
Black-backed woodpecker	S3 Vulnerable	Lodgepole pine forests and burned areas.
White-headed woodpecker	S2S3 Imperiled/Vulnerable	Mature ponderosa pine
Northern flicker	S5 Secure	Variety of forest types
Pileated woodpecker	S4 Apparently secure	Mature to old-growth mixed conifer forest

*Existing condition and project effects for these species were covered in the above section Wildlife Species Listed under the Endangered Species Act

Existing Condition for Northern Goshawk

Goshawks tend to have larger home ranges that incorporate multiple spatial scales to meet their life requirements (Squires and Kennedy 2006). Three habitat areas are recognized as important for breeding goshawks. The nest area is composed of one or more forest stands or alternate nests. A post fledging area around the nest is used by adults and young from the time of fledging, when the young are still dependent on the adults for food. A foraging area comprises the breeding pair's entire home range. Goshawk nest areas are unique in structure, with large trees, dense canopies, and high canopy closure. Nesting habitat encompasses approximately 200 acres surrounded by approximately 75 acres in stem exclusion or understory re-initiation with high canopy closure. The outlying 125 acre area should contain a mix of forest structure with significant areas of open canopy mixed with more closed forest.

Numerous authors have described the size of the post fledging areas ranging from 296 to 593 acres. This area provides fledgling hiding cover and foraging opportunities as fledglings learn to hunt and may correspond to the area defended by the breeding pair. Foraging areas are typically 4,900 to 5,900 acres of forest mosaic that support a wide range of suitable prey and are usually more open than nesting areas. This area should contain large trees, snags, down logs, vegetative layering, and other structural elements important to prey species.

The following are potential threats to goshawk habitat and persistence:

a) Timber harvest of mature and older nesting stands,
b) Fire suppression may lead to increased susceptibility of stand-replacing fire and insect and disease outbreaks, which can result in the deterioration or loss of nesting habitat,
c) Disturbance due to logging activities conducted near nests during the incubation and nestling periods can cause nest failure due to abandonment, and
d) High road densities may result in loss of snag and down wood habitat important to goshawk prey.

Forest-wide northern goshawk nesting habitat was modeled using all plant association groups except juniper, mountain hemlock, and vegetation at higher elevations; dense stands and all seral stages were included. Minimum tree diameter was defined as 10 inches except in lodgepole pine where the minimum diameter was defined as 5 inches. Lower diameter limits were used because the region-wide vegetation database quantifies average diameter of the majority of species even though the stand may have sufficient large trees within that meet the needs for nesting. This may over estimate nesting habitat in lodgepole stands, as lodgepole plantations would meet this definition and not have any large trees mixed in. There are 446,402 acres of potentially suitable goshawk habitat on the Forest.

There are two historic goshawk nests in the project area and none of these are with within ¼ mile of the proposed activities. These nests are considered historic with no documented activity in the past 5 years. The project area has been surveyed to protocol for northern goshawk as part of the West Bend Vegetation Management project (2010 to 2011) and the proposed Kew Vegetation Management project (2013 to current) with no detections. If a northern goshawk nest is discovered the resource protection measure WL-RPM-6 (Ch. 2.6.1,) stipulates a timing limitation on disturbing activities to protect the nest.

Alternative 2 has approximately 920 acres of potential habitat within the 200 meters of proposed trails and Alternative 3 has 787 acres of potential habitat within trail buffers.

Effects Analysis for Northern Goshawk

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects to this species. Current goshawk habitat and prey availability would not be reduced from this alternative.

Alternative 2

Based on the absence of goshawk nests in the project area Alternative 2 is expected to have no direct impacts to nesting birds. If a goshawk nest is discovered then resource protection measures WL-RPM-6 (Ch. 2.6.1) suggests a timing restriction from March 1 to August 31 for all disturbing activities within ¼ mile of an active nest.

Goshawk habitat is concentrated near mountain bike Trails 3 and 4 (Figure 2-1, 2-2). Larger trees that contribute to suitable northern goshawk habitat would not be removed under the trail construction activities. Construction of the mountain bike trails would not reduce the stand conditions necessary to support nesting goshawk. Increased human presence could prevent northern goshawk from establishing a territory as this species tends to be sensitive to human presence but there is considerable human use currently.

Tree removal associated with Trail 1would not expected to change the stand conditions for northern goshawk. Large portions of this section would be constructed on an existing roadbed and the entire length of this trail is near the highway where goshawks are not expected to nest or forage.

Implementation of this alternative could impact northern goshawk through temporary displacement of individuals during trail construction and recreational use of the trails. The presence of goshawks near construction activities is not expected to occur as there are no known goshawks documented in the project area and ongoing human presence may already be inhibiting goshawk presence in the area.

Alternative 3

Direct and indirect impacts under Alternative 3 are the same as Alternative 2. Alternative 3 has less potential habitat within 200 meters of the proposed trails but the majority of potential habitat is located near trails common to both alternatives (Trails 3 and 4). Removal of Trail 2 under this alternative reduces potential northern goshawk habitat near a proposed trail by 15%. Reduced parking lot size would not substantially reduce the potential impacts to goshawks because the area provides suitable stand structure for goshawks but the existing use likely precludes goshawk occupancy of the area.

Cumulative Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects; therefore, there would be no cumulative effects to northern goshawk from this alternative.

Alternative 2 and Alternative 3

The primary action for cumulative impacts consideration to northern goshawk habitat is the West Bend Vegetation Management project. This action proposes treatment units along all sections of

proposed trails. There are approximately 8,000 acres of vegetation treatments, in the West Bend project area, proposed to occur in goshawk reproductive habitat. There are no goshawk nests currently identified in the West Bend project area and resource protection measures specify timing restriction and reserve areas if a nest is discovered in the future. The West Bend project proposes to treat these historic goshawk stands in a manner to promote future development of habitat so potential impacts to goshawk are expected to be minimal.

Past and current vegetation management projects in the Project Area include the East Tumbull HFRA Project and the Katalo East and West project. East Tumbull proposed 5,769 acres of commercial thinning and fuels reduction in the Project Area while Katalo East and West combine for 8,857 acres of commercial thinning and fuels reduction in the project area. Fuels reduction activities if they occur at the same time in the same general area as trail construction can displace goshawk individuals. Long-term benefits from fuels reduction activities (activities proposed under the action alternatives would not reduce habitat) can promote the development of mature overstory conditions.

Vegetation management activities and fuels reduction projects associated with West Bend and Katalo could occur during trail construction and use of the Welcome Station Connections project. Construction activities for this project would be short-term for the mountain bike trails in northern goshawk habitat and primarily result in disturbance of individuals should they occur in the area. The Welcome Station Connections project would not noticeably contribute cumulative impacts to northern goshawk in the project area.

Determination

Implementation of Alternative 1 would not contribute to a negative trend in viability for northern goshawk on the Deschutes National Forest as there are no goshawk nests identified in the area and currently available habitat would remain.

Implementation of Alternative 2 or Alternative 3 would contribute to a slight negative trend in viability for the northern goshawk on the DNF. Because this project impacts less than 1% of suitable habitat across the Forest, the overall direct, indirect and cumulative effects would result in a small negative trend of habitat (increase in human disturbance). The increase in disturbance would be insignificant at the Forest scale. The Welcome Station Connections project is consistent with the Forest Plan, and thus continued viability of northern goshawk is expected on the DNF.

Existing Condition for Cooper's Hawk

Cooper's hawk were selected as a terrestrial MIS for providing stand diversity and retention of small blocks of 50 to 80 year old black bark pine stands and mixed conifer stands. Cooper's hawk nest sites varied from pure stands of ponderosa pine at lower elevations, to mixed stands of ponderosa pine and white fir at mid-elevations, to mixed and pure stands of white fir and lodgepole pine at high elevations. The most common type of tree used for nests are mature ponderosa pine overstory with mixed understory of ponderosa pine and white fir. Nests tend to be built in trees with high crown volumes, utilizing mistletoe for nest structures.

Cooper's hawk nesting habitat was modeled using all plant association groups, except juniper, mountain hemlock and vegetation at higher elevations. Stands had a minimum tree diameter of 10 inches, except in lodgepole pine where the minimum diameter was 5 inches. The maximum dbh used was 20 inches. Hardwood stands where the canopy cover was greater than 50% was included in the model. There are 275,340 acres of potential Cooper's hawk nesting habitat on the Forest.

The primary threat to Cooper's hawk is habitat alteration and/or destruction from activities such as timber harvest, which can reduce nest site and prey availability thereby limiting population growth. There are five documented Cooper's hawk nests in the project area. Several of these have not been recorded as active for ten or more years. No Cooper's hawk nests are considered active within the project area. If a Cooper's hawk nest is discovered then timing limitations found in resource protection measure WL-RPM-6 (Ch. 2.6.1) would apply.

Alternative 2 has approximately 920 acres of potential habitat within the 200 meters of proposed trails and Alternative 3 has 787 acres of potential habitat within trail buffers.

Effects Analysis for Cooper's Hawk

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects to this species. Current suitable Cooper's hawk habitat would remain as is and continue to be available.

Alternative 2 and Alternative 3

There are historic Cooper's hawk nests in the project area but nests have not been active since the late 1990s. Cooper's hawk habitat is concentrated near Trails 3 and 4 (mountain bike trails) and tree removal would be limited during mountain bike trail construction. Potential habitat disturbance is limited to areas where increased human presence might disturb nesting Cooper's hawk. Since there are no known Cooper's hawk nests in the project area the probability of nesting or foraging individuals being disturbed by increased human presence is low. If a nest is discovered, resource protection measure WL-RPM-6 (Ch. 2.6.1) places a timing limitation (April 15 to August 31) on disturbing activities within ¼ mile of Cooper's hawk.

Cumulative Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects; therefore, there would be no cumulative effects to Cooper's hawk from this alternative.

Alternative 2 and Alternative 3

The West Bend Vegetation Management project proposes treatments along all sections of proposed trails. There are approximately 8,000 acres of vegetation treatments in the West Bend project area proposed to occur in Cooper's hawk reproductive habitat. Historic Cooper's hawk nest sites in the West Bend project area would be managed as active. There are no Cooper's hawk nests currently identified in the West Bend project area as active and resource protection measures specify timing restriction and reserve areas if a nest is discovered in the future. Impacts from this project along with proposed activities would have short-term impacts (construction disturbance from proposed trails and mechanical disturbance from vegetation management practices) if a Cooper's hawk is present in the area. Since there are no known Cooper's hawk nests in the project area, the probability of nesting or foraging individuals being disturbed by increased human presence is low

Past and current vegetation management projects in the Project Area include the East Tumbull HFRA Project and the Katalo East and West project. East Tumbull proposed 5,769 acres of commercial thinning and fuels reduction in the project area while Katalo East and West combine for 8,857 acres

of commercial thinning and fuels reduction in the project area. Fuels reduction activities can displace individuals during implementation, but can have long-term benefits if mature overstory conditions develop.

Vegetation management activities and fuels reduction projects associated with West Bend and Katalo could occur during trail construction and use of the Welcome Station Connections project. Construction activities for this project would be short–term for the mountain bike trails in Cooper's hawk habitat and primarily result in disturbance of individual. The Welcome Station Connections project would not noticeably contribute cumulative impacts in the project area.

Determination

Implementation of Alternative 1 would not contribute to a negative trend in viability for Cooper's hawk on the DNF. All currently available nesting habitats would remain for the species.

Implementation of Alternative 2 or Alternative 3 would contribute to a small negative trend in viability for the Cooper's hawk on the DNF. Because this project impacts less than 1% of suitable habitat across the Forest, the overall direct, indirect and cumulative effects would result in a small negative trend of habitat (increase in disturbance). The increase in disturbance would be insignificant at the Forest scale. The Welcome Station Connections project is consistent with the Forest Plan, and thus continued viability of Cooper's hawk is expected on the DNF.

Existing Condition for Sharp-shinned Hawk

Sharp-shinned hawk nest sites are characterized as dense, conifer stands, with dense over stories and sparse understories. Nests are typically found in young (25 to 50 years) even-aged conifer stands with single-layered canopies. The vegetation at nest sites is usually in the early successional stages and extremely dense. Nest stands are dominated by trees 7.5 to 37.5 cm dbh and average 2,286 trees per hectare.

Tree species composition varies from pure stands of ponderosa pine at lower elevations, to mixed stands of ponderosa pine and white fir at mid-elevations, to mixed and pure stands of white fir and lodgepole pine at high elevations. Stands of all age classes in each timber type are represented, however the most common type is mature ponderosa pine overstory with mixed understory of ponderosa pine and white fir.

Direct habitat loss can occur from urban development and timber harvest. Habitat loss can also occur indirectly as young forest stands mature and no longer provide suitable stand conditions for nesting. It should be noted though that impacts of timber harvest to sharp-shinned hawks would be unique from site to site depending on the structure of the forest at the time of harvest, the form and intensity of harvest, and the temporal perspective.

Forest-wide sharp-shinned hawk nesting habitat was modeled using white fir, grand fir, Douglas-fir lodgepole pine and ponderosa pine plant association groups. This included dense canopy with trees with a minimum diameter of 5 inches with a 20 inch maximum. Stand replacement fires and recent management activities within the last 5 years were not considered habitat. The Forest contains approximately 486,138 acres of potential sharp-shinned hawk nesting habitat.

Alternative 2 has approximately 931 acres of potential habitat within the 200 meters of proposed trails and Alternative 3 has 797 acres of potential habitat within trail buffers.

Effects Analysis for Sharp-shinned Hawk

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects to this species. Current sharp-shinned hawk habitat would continue to be available.

Alternative 2 and Alternative 3

There are no known sharp-shinned hawk nests within ¼ mile of the proposed trails. If a nest is discovered then resource protection measure WL-RPM-6 (Ch.2.6.1) would prohibit disturbing activities within ¼ mile of the nest from April 15 to August 31. The majority of modeled sharp-shinned hawk habitat is near Trail 3 and 4 (mountain bike) and tree removal is expected to be infrequent as the mountain bike trail construction description allows for avoidance of large trees and clumps of small trees. Removal of individual trees would not alter stand conditions to an unsuitable condition for sharp-shinned hawks. Potential disturbance to sharp-shinned hawks would occur from trail construction and use near nesting or foraging individuals which could result in temporary displacement. Nest abandonment is not expected because trail construction activities tend to occur quickly and the potential for a prolonged disturbance near a nest sufficient to cause abandonment is not expected.

Cumulative Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects; therefore, there would be no cumulative effects to sharp-shinned hawk from this alternative.

Alternative 2 and Alternative 3

The West Bend Vegetation Management project proposes treatments along all sections of proposed trails. There are approximately 9,000 acres of vegetation treatments in the West Bend project area proposed to occur in sharp-shinned hawk reproductive habitat. There are no sharp-shinned hawk nests currently identified in the West Bend project area and resource protection measures specify timing restriction and reserve areas if a nest is discovered in the future.

Past and current vegetation management projects in the project area include the East Tumbull HFRA Project and the Katalo East and West project. East Tumbull proposed 5,769 acres of commercial thinning and fuels reduction in the Project Area while Katalo East and West combine for 8,857 acres of commercial thinning and fuels reduction in the project area.

Vegetation management activities and fuels reduction projects associated with West Bend and Katalo could occur during trail construction and use of the Welcome Station Connections project. Construction activities for this project would be short-term for the mountain bike trails in sharp-shinned hawk habitat and primarily result in disturbance of individual. The Welcome Station Connections project would not noticeably contribute cumulative impacts in the project area.

Determination

Implementation of Alternative 1 would not contribute to a negative trend in viability for sharp-shinned hawk on the DNF. Currently available nesting habitats would remain for the species.

Implementation of Alternative 2 or Alternative 3 would contribute to a small negative trend in viability for the sharp-shinned hawk on the DNF. Because this project impacts less than 1% of suitable habitat across the Forest, the overall direct, indirect and cumulative effects would result in a small negative trend of habitat (increase in disturbance). The increase in disturbance would be insignificant at the Forest scale. The Welcome Station Connections project is consistent with the Forest Plan, and thus continued viability of sharp-shinned hawk is expected on the DNF.

Existing Condition for Great Gary Owl

Great gray owls were chosen as a terrestrial MIS to monitor habitat comprised of forests 30 acres and larger adjacent to riparian and meadow ecosystems. Availability of nest sites and suitable foraging habitat are considered the most important factors for great gray owl (Nero 1980). Prey abundance (vole and/or gopher), meadow vegetation (height and cover), meadow moisture, forest canopy cover, and snag presence (Bull and Henjum 1990, Whitfield and Gaffney 1997) are also essential habitat components. Bryan and Forsman (1987) found key habitat for great gray owls in central Oregon were a meadow system associated with coniferous forests.

Great gray owls use mature coniferous forests within 0.1 to 0.2 miles of an open, typically wet meadow (Marshall et al 2003, Riper et al. 2006, Hayward and Verner 1994, Duncan 1997). In central Oregon, great gray owls also occupy old lodgepole pine or ponderosa/lodgepole pine mix forests in proximity to openings (Marshal et al. 2003). A study in the Cascades found the openings great gray owl use range in size, anywhere from 15 to 250 acres (Bryan and Forsman 1987). Where mature stands exist near open grassy areas (for foraging), tree species and forest composition seem of little importance to these birds (Hayward and Verner 1994).

Surveys for an individual near Ryan Ranch Meadow have been conducted since 2009 and no owls have been identified recently. The meadow is over 0.5 miles from Trail 2. Great gray owl habitat was modeled using all forest types with trees 15 inch dbh or larger, within 0.35 miles of a ten acre opening. The Forest has approximately 197,929 acres of potential great gray owl habitat. Great gray owl habitat is concentrated around Ryan Ranch Meadow and a smaller patch adjacent to Cascade Lakes Highway. The patch near the highway meets the minimum requirements to be great gray owl habitat but the opening is manmade and adjacent to a busy highway so regular use is not anticipated.

Alternative 2 has approximately 85 acres of potential habitat within the 200 meters of proposed trails and Alternative 3 has 31 acres of potential habitat within trail buffers.

Effects Analysis for Great Gray Owl

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects to this species. Potential great gray owl habitat in the project area is limited to area around Ryan Ranch Meadow and the small clearing near Cascade Lakes Highway.

Alternative 2

Modeled great gray owl habitat occurs in two patches one near Trail 1 and the other near Trail 2 close to Ryan Ranch Meadow. There is 0.45 miles of Trail 1 (the paved path) that goes through potential great gray owl habitat but this area is considered sub-optimal because it is adjacent to the Cascade Lakes Highway. The open area near the highway is man-made (from previous harvest activities and an existing golf course) so prey populations may not be as abundant as with meadow habitats.

Approximately 0.33 miles of Trail 2 (a mountain bike trail) goes through potential great gray owl habitat.

Implementation of this alternative could negatively impact great gray owls through temporary displacement during trail construction and use if individuals occur near the trail sections. Surveys for great gray owl have not recently identified individuals near Ryan Ranch, but this area provides suitable habitat for the species. Trail construction activities would not remove large trees that could provide great gray owl nesting structures. Potential impacts to this species are expected to occur infrequently based on the proximity to suitable habitat and the recent lack of observations in the area.

Alternative 3

Direct and indirect impacts to great gray owl under Alternative 3 are similar to Alternative 2. No large trees would be removed so potential great gray owl nesting structures would remain. Potential impacts to the species are reduced because Trail 2, which is located near the most suitable habitat in Ryan Ranch Meadow, would not be constructed.

Cumulative Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects; therefore, there would be no cumulative effects to great gray owl from this alternative.

Alternative 2 and Alternative 3

The West Bend Vegetation Management Project proposes treatment of approximately 1,600 acres of great gray owl reproductive habitat predominantly through thinning from below treatments and precommercial thinning. Treatment of these acres would improve great gray owl habitat by removing the smaller diameter trees and increase foraging opportunities for the species.

Ongoing recreation activities that occur near Ryan Ranch combine with proposed recreational activities are most likely to contribute cumulative impacts to great gray owl because the area receives substantial human use through most of the year. Many of the roads in the area are closed during the winter because of the Tumalo Winter Range Cooperative Closure but there is non-motorized use through the winter. There is an existing non-motorized trail in the Ryan Ranch area that goes near the great gray owl but this does not get much use in winter.

Vegetation management activities and fuels reduction projects associated with West Bend and Katalo could occur during trail construction and use of the Welcome Station Connections project. Construction activities for this project would be short-term in great gray owl habitat and primarily result in temporary disturbance of individuals. The Welcome Station Connections project would not noticeably contribute cumulative impacts in the project area.

Determination

Alternative 1 would not affect great gray owls and there would be no contribution to a negative trend in viability for the species on the DNF.

Implementation of Alternative 2 or Alternative 3 would contribute a slight negative trend for great gray owl viability on the DNF. Proposed trails (Trail 1 and Trail 2) both go through modeled great

gray owl habitat but these are suboptimal areas when compared to meadow habitat. Tree removal would be minimal with retention of large snags and trees and would not change stand conditions for the species. There may be temporary displacement of individuals during construction and use but the lack of current observations indicates that this type of disturbance would be very infrequent.

Existing Condition for Great Blue Heron

Great blue herons nest in trees, bushes, on the ground and on artificial structures, usually near water. They prefer to nest in vegetation on islands or in swamps, probably to avoid ground predators. Nest locations in Oregon were determined primarily by proximity and availability of food but nest-site fidelity is weak.

Human activity can disturb nesting great blue herons but disturbance does not always lead to adverse impacts at the population level. Several studies have linked abandonment of great blue heron colonies to human activity, including housing and industrial development, highway construction, logging, vehicle traffic, and repeated human intrusions (Kelsall and Simpson 1979, Drapeau et al. 1984, Forbes et al. 1985b, Leonard 1985, Vennesland and Butler 2004).

Mapping of great blue heron habitat on the Deschutes National Forest focused on rookery (nesting) habitat, including all riparian and wet meadow habitats. Great blue heron nesting habitat was defined as forested areas within ½ mile of all water sources and ¼ mile from disturbances (e.g. recreation sites). All lakes, ponds, wet meadows, streams, and rivers were buffered ½ mile to develop a preliminary habitat layer. Campgrounds, boat ramps, subdivisions, trails and trailheads were buffered by ¼ mile and excluded where they overlap with habitat. The Forest contains approximately 210,194 acres of great blue heron habitat and the North Unit Diversion Dam-Deschutes River waters contains 2,440 acres or 1% of forest-wide total habitat.

Alternative 2 has approximately 211 acres of potential habitat within the 200 meters of proposed trails and Alternative 3 has 0 acres of potential habitat within trail buffers.

Effects Analysis for Great Blue Heron

Direct and Indirect Effects

Alternative 1 – No Action

The No Action Alternative would have no direct or indirect effects to this species. Current great blue heron habitat would continue to be available.

Alternative 2

Trail 2 is proposed through 211 acres of great blue heron habitat. This habitat patch provides marginal habitat and is west of Ryan Ranch Meadow. Overstory trees are predominantly ponderosa pine and a substantial distance from preferred habitat closer to the Deschutes River. There are no known great blue heron observations in the ponderosa pine west of the meadow. There are no direct or indirect impacts expected to this species from implementing this alternative.

Alternative 3

There would be no direct or indirect impacts to great blue heron with the implementation of Alternative 3. The only modeled habitat for the species is along Trail 2, which is only in Alternative 2. Existing habitat would remain as currently available.

Cumulative Effects – All Alternatives

Since there are no direct or indirect effects for any of the action alternatives, including the no action alternative, there are no cumulative effects to great blue heron or habitat.

Determination

Implementation of any of the alternatives would result in no reduction in the viability of the great blue heron on the DNF. Habitat conditions would remain the same and the proposed trail in Alternative 2 is far enough away from potential great blue heron habitat that no disturbance to potential rookeries is expected.

Existing Condition for Red-tailed Hawk

The Forest Plan has identified red-tailed hawk as a terrestrial MIS for large trees in mixed structural habitat. Red-tailed hawks generally nest in the largest, tallest tree available that provides unobstructed views within their territory. They inhabit a variety of forested to open land ecosystems and elevations from alpine down to desert ecosystems.

Preferred habitats are open to semi-open coniferous, deciduous and mixed forests, forest edges, grasslands, parklands, rangelands, river bottomlands, and agricultural fields with scattered trees. Forest clearings, alpine meadows, estuaries, marshes, agricultural lands, clear cuts, sagebrush plains, and high elevation environments are also used, though less commonly. Nesting occurs in large mature trees, usually at a forest edge or near an opening in canopy.

Limiting factors in preferred habitat are availability of suitable perches and hunting grounds open enough to locate and catch ground prey. Perches can be any structure that provides unobstructed views and can be natural or man-made. Perches are used for foraging, roosting, resting, mating, and defending territory.

The DNF estimated red-tailed hawk nesting habitat as all forest types with tree diameters 15 inches and greater in serial stages 5-7, with open canopy cover. Modeling also included dense canopy cover in ponderosa pine and mixed-conifer forest types. This resulted in an estimated 192,492 acres of potential red-tailed hawk nesting habitat on the DNF. There is one documented red-tailed hawk nest in the project area between the Good Dog! parking lot and the forest boundary.

Alternative 2 has approximately 1,304 acres of potential habitat within the 200 meters of proposed trails and Alternative 3 has 861 acres of potential habitat within trail buffers.

Effects Analysis for Red-tailed Hawk

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects to this species. Current habitat conditions would continue to be available at existing levels. The active red-tailed hawk nest would continue to be near an existing trail.

Alternative 2

The active red-tailed hawk nest near Trail 1 would have a ¼ mile limitation from March 1 to August 31 on project construction activities. If annual monitoring shows the nest to be inactive for the year then work could occur (Ch. 2.6.1, WL-RPM-3). Modeled red-tailed hawk habitat occurs adjacent to most of the proposed trails in this alternative. Predicted tree removal is not expected to change stand conditions for red-tailed hawk. Larger trees or snags that could provide nesting structure would not be removed under this alternative. This species can be tolerant of human presence unless the disturbance is prolonged and close to an active nest. Red-tailed hawks using the area for nesting or foraging could be temporarily displaced from construction activities, but project activities are not expected to convert red-tailed hawk habitat into an unsuitable condition.

Alternative 3

Potential direct or indirect impacts from this alternative are very similar to Alternative 2. The one identified red-tailed hawk nest is near a section of trail common to both alternatives. Potential for temporary displacement is still present in this alternative but slightly reduced since there are approximately 500 fewer acres of potential red-tailed hawk near proposed trails. Tree removal under this alternative is similar to Alternative 2 as the tree count is only for Trail 1, which is common to both alternatives.

Cumulative Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects; therefore, there would be no cumulative effects to red-tailed hawk from this alternative.

Alternative 2 and Alternative 3

The West Bend Vegetation Management Project proposes treatment of approximately 8,500 acres of red-tailed hawk habitat. These treatments are expected to improve habitat conditions for red-tailed hawk as stand conditions become more open. West Bend proposed treatments, past vegetation management activities and this proposed project (would not remove any existing habitat) have and would continue to improved habitat conditions for red-tailed hawk as stand densities are reduced. Fuels reduction activities if they occur at the same time in the same general area as trail construction activities can cause short-term displacement of individuals.

Ongoing recreation activities and proposed recreation activities from use and maintenance of the existing and proposed trails may displace foraging red-tailed hawks but this is expected to be infrequent since the trail system has been established for many years, recreational use of the area is high and any hawks in the area are likely acclimated to this level of disturbance.

Vegetation management activities and fuels reduction projects associated with West Bend and Katalo could occur during trail construction and use of the Welcome Station Connections project. Construction activities for this project would be short-term for red-tailed hawk habitat and primarily result in disturbance of individuals. The Welcome Station Connections project would not noticeably contribute cumulative impacts in the project area.

Determination

Implementation of Alternative 1 would not contribute to reduced viability for red-tailed hawk on the Forest. There would be no alteration of habitat or disturbance to individuals from this alternative.

Implementation of Alternative 2 or Alternative 3 would contribute a slight negative trend for red-tailed hawk viability on the Deschutes National Forest. This project impacts less than 1% of the suitable habitat across the Deschutes National Forest and the direct, indirect, and cumulative impacts would not be detectable at the forest scale. The Welcome Station Connections project is consistent with the Forest Plan, and thus continued viability of red-tailed hawk is expected.

Existing Condition for Osprey

Osprey were chosen as a terrestrial MIS due to their dependence on fish species and use of snags and trees surrounding large lakes. Key habitat components are large-diameter snags and dead-topped live or dead trees in or near clear, unobstructed fish-bearing large lakes and rivers.

Preferred nest sites are usually snags or dead topped trees near water, presumably to deter mammalian predation (Ewins 1997). Cliffs, rock pinnacles and even bare ground on predator-free islands are also used. They also use artificial structures including utility poles, pilings, windmills, microwave towers, chimneys, cell towers, off-shore duck blinds, buoys, and channel markers (Marshall et al. 2003).

Several studies have demonstrated that human disturbance can cause nest site abandonment or reproductive failure (Lind 1976, Swenson 1979, Vana-Miller 1987, Ewins 1997). Ospreys are most sensitive to disturbance during incubation and the first 3 to four 4 after hatching (Van Daele and Van Daele 1982). Other osprey individuals who initiate nests near human activities appear to have a greater tolerance for disturbance (Ewins 1997).

At the eastern edge of the project area there are seven documented osprey nests along the Deschutes River. None of these nests have been recorded as active recently and most were documented in the late 1980s to early 1990s. None are within ¼ mile of the proposed trails. There are 14,705 acres of suitable osprey habitat in the North Unit Diversion Dam-Deschutes River watershed or 3% of the 495,360 total acres of habitat forest-wide.

Alternative 2 has approximately 1,307 acres of potential habitat within the 200 meters of proposed trails and Alternative 3 has 615 acres of potential habitat within trail buffers.

Effects Analysis for Osprey

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects to this species. Existing habitat for this osprey would continue to be available. There would be no reduction of potential nesting habitat from this alternative.

Alternative 2 and Alternative 3

There are inactive osprey nests in the project area but these are located closer to the Deschutes River. None of these nests are within ¼ mile of any of the proposed trails. Areas modeled as osprey habitat are associated with the Deschutes River, near Trails 1 and 2. The predicted habitat is near high traffic routes such as Cascade Lakes Highway and FSR 41. Osprey can nest near these types of roads but there is more suitable habitat near the river, which is also closer to fishing grounds. There are no osprey nests in areas where trail construction is proposed and retention of large snags and trees would provide future nesting structure if birds do become resident. No direct or indirect impacts to osprey are expected under the action alternatives because all known nests are beyond ¼ mile from proposed

routes, large trees that would provide future nest sites would be retained and the higher quality habitat is near the Deschutes River and outside of proposed trail routes.

Cumulative Effects – All Alternatives

Since there are no direct or indirect effects for any of the alternatives, including the no action alternative, there are no cumulative effects to osprey or habitat.

Determination

Implementation of any of the alternatives would not reduce the viability of osprey on the DNF as no direct, indirect or cumulative impacts are expected.

Existing Condition for Elk

Rocky Mountain elk were chosen as a terrestrial MIS for its socioeconomic importance to the hunting community in central Oregon. Elk management objectives were developed with the Oregon Department of Fish and Wildlife (ODFW). Objectives for both summer and winter populations are identified with annual monitoring conducted by ODFW to determine the annual hunting recommendations. Eleven key elk habitat areas totaling 59,825 acres are identified in the DNF LRMP and management in these areas would provide habitat conditions needed to support a minimum of 1,500 summer elk and 340 wintering elk.

Elk are negatively affected by vegetation management activities that reduce hiding and thermal cover. Hiding cover provides elk security areas from disturbance (e.g., motorized vehicles, hikers and other recreationists) and predators. Elk avoid areas with high road density when roads remain open for use but may use roads as travel corridors if areas are closed (Rowland et al. 2000). High road densities can increase illegal harvest as access to elk populations increase. Winter range can be a critical habitat element and the availability of this habitat type can be affected by housing development, overgrazing and forage quality.

Rowland et al. (2005) found elk avoided heavily traveled roads. Wisdom et al. (2005) found elk were generally farther from roads with traffic rates as low as 1 vehicle per 12 hours during day and nighttime hours. Another study conducted by Wisdom et al. (2005) on the effects of off-road recreation on mule deer and elk, showed elk had greater flight probabilities and movement rates for all four off-road activities (ATV, mountain biking, horseback riding, and hiking) when compared to no human activity. Elk reactions were more pronounced during the ATV and mountain biking activities than to horseback riding and hiking. Lyon (1979) reported the area of avoidance for elk is generally ¼ to ½ mile from a road depending on the amount of traffic, road quality, and density of cover near roads.

Rowland et al. (2005) reported the primary effect of roads on elk was habitat fragmentation because there are fewer patches of cover large enough to function effectively (Rowland et al. 2000). Rowland et al. (2004) also documented three main direct impacts on elk.

- Elk avoid areas near roads.
- Elk vulnerability to mortality from hunter harvest, both legal and illegal, increases as open road density increases.
- In areas of high road densities, elk exhibit higher stress levels (Rowland et al. 2005) and energetic costs of moving away from roads may be substantial (Cole et al. 1997).

The project area includes 6,634 acres (31%) of the Ryan Ranch Key Elk Area. Forest Plan direction for the Ryan Ranch KEA (WL-45) states (DLRMP pg. 4-56):

- Public use will be encouraged on travel routes which would minimize conflicts with elk
- Public use will not be restricted within the Deschutes Wild and Scenic River during the calving season (May 1 to July 31)
- Facilities will not be developed nor activities promoted which would encourage public use during the winter
- Motorized traffic will be limited to designated routes
- Elk habitat improvements must be compatible with recreation, visual objectives, and Wild and Scenic River objectives.

Forest Plan (WL-46) recommends open road densities between 0.5 and 1.5 miles per square mile in key elk areas where public use is heavy, the low end of the range should be the objective (LRMP pg. 4-57). Current road density in the Ryan Ranch KEA is 2.02 miles per square mile. The Deschutes National Forest Management Indicator Species assessment for elk calculated a road density of 2.77 miles per square mile in the Ryan Ranch KEA. The current density is less than the previously calculated density because of road closures in the Katalo East and West, Highway 97 closure and some previously identified roads that were converted to trail (S. Bigby, personal communication 2013). The project area has 89.3 miles of open roads for an overall road density of 2.81 miles per square mile, which is substantially higher than the road density within the Ryan Ranch KEA. There are 17.3 miles of Maintenance Level 1 (ML1) roads that are administratively closed but are still present on the ground and many are not effectively preventing vehicle use. Many of these roads are in the Tumalo Winter Range Cooperative Closure and several roads in the Ryan Ranch KEA that are closed to motorized traffic in the winter.

Non-motorized trails can affect elk movement when in use. Increased human presence, especially during the winter, can increase flight response in big game and result in avoidance of areas and reduced access to essential habitat components. The project area has 101.7 miles of non-motorized trail that is predominantly designated for bicycles. Designated trail density is 3.21 miles per square mile in the project area with most of the concentrated use north of Cascade Lakes Highway in the Phil's Trailhead area. The Ryan Ranch KEA has 50.01 miles of designated non-motorized trails for an overall density of 1.49 miles per square mile with trails concentrated east of FSR 41 between the road and the Deschutes River.

Two primary standards and guidelines associated with the KEAs include hiding cover and open road densities. Hiding cover is a habitat attribute which provides escapement from predation as well as avoidance from harassment potential by hunters and other recreation use. The guidelines for hiding cover states, "Hiding area must be present over 30% of National Forest Land in each key area. Lakes and 50 to 80 year old ponderosa pine stands (black bark) should not be used in evaluating conformance." A separate set of guidelines are used to address "black bark pine management." These stands provide very poor quality hiding cover due to the lack of horizontal structure and a single age class of trees.

The Forest Plan defines thermal cover for elk as a minimum 10 acre patch of 40 feet or taller trees with 40% canopy cover or more. Hiding cover is described as a minimum 6 acre patch capable of concealing 90% of an adult animal at 200 feet (Thomas et al. 1979). The Forest Plan states that hiding cover must be present over at least 30% of each KEA (excluding "black bark" ponderosa pine) (LRMP pg. 4-57, WL-47). There are 3,437 acres (or 16%) of hiding cover in the Ryan Ranch KEA. There are 4,478 acres of thermal cover or 21% of the KEA. The Ryan Ranch KEA is currently below plan direction for hiding cover but slightly above plan direction for thermal cover.

Four ODFW Wildlife Management Units (WMUs); Metolius, Upper Deschutes, Paulina, and Fort Rock are associated with the DNF. The Metolius and Upper Deschutes WMU's and a small portion of the Ft. Rock WMU west of Highway 97 are within the General Cascade Elk rifle season. Due to the small number of elk on the Forest and the great distances these small herds travel, hunter success is extremely low (USFS 2012). Population estimates for each of the WMUs are consistent with the trend data for all of Eastern Oregon. Trend data is not collected for these WMUs, populations are estimated annually based on management objectives for bull to cow ratios. The ODFW monitors hunter success and bull ratios to help define the general trends of these populations, watching for declines. The Welcome Station Connections project is within the Upper Deschutes WMU, although the population is below management objective for the Upper Deschutes WMU, trend data for elk is stable to increasing. The overall management objective for elk populations in the High Cascade WMU's is currently stable to slightly increasing (USFS 2012). The project area currently provides recreational hunting opportunities especially in the western portion.

Modeled habitat, as described in the Analysis Methods at the start of Chapter 3, resulted in Alternative 2 having approximately 217 acres of potential habitat within the 200-meter buffer of the proposed trails and Alternative 3 having 127 acres of potential habitat within trail buffers.

Effects Analysis for Elk

Direct and Indirect Effects

Alternative 1 – No Action

Ongoing recreation activities are expected to continue displacing elk throughout the project area. Current road densities exceed Forest Plan guidance and would continue to fragment elk habitat and inhibit movement. Seasonal winter range road closures that are part of Tumalo Winter Range Cooperative Closure Area improve elk security areas in the winter. Non-motorized recreation would continue at similar to increasing use levels as currently occur. Existing non-motorized trail density in the project area (3.21 mi/mi^2) is substantially higher than within the Ryan Ranch KEA (1.49 mi/mi^2).

Alternative 2

The primary impact to elk from this activity is the increase in non-motorized trails in the project area and Ryan Ranch KEA. Use of non-motorized trails can displace elk from an area in a similar manner as roads. There are 1.1 miles of non-motorized trails identified for decommissioning and most of these are in the Key Elk Area. Potential benefits from decommissioning are not expected to be substantial as most of the decommissioning is associated with trail re-routing and not elimination. These trails are heavily used and not covered under the Tumalo Winter Range Cooperative Closure since use is non-motorized. Use of these trails in winter is not encouraged but does occur. New technology (i.e., wider tires for winter mountain biking) is allowing increased access to trails in the winter. This alternative proposes an additional 10.8 miles of non-motorized trail in the KEA which is a 18% increase of the existing designated trails in the KEA. This increases the non-motorized trail density from 1.49 mi/mi^2 to 1.77 mi/mi^2. Trail locations were identified in project planning to reduce some potential impacts to elk by keeping trails within approximately 150 feet of existing roads to minimize potential increased habitat fragmentation. Trails 1 and 2 are near roads that are open year-round.

Elk are known to move across FSR 41 between winter and summer grounds and there is an identified migration area just south of Trail 2. Use of a single non-motorized trail may not be sufficient to impede elk movement but the additive effects of a new trail combined with the paved road and other existing trails may begin to alter elk movement between summer and winter range. These additional

trails may slightly alter elk movements, especially during trail construction, which can affect hunter success but hunting opportunities would continue to be provided in the project area.

Tree removal would not reduce hiding cover, as there is none mapped in the project area. The number of trees to be removed is not expected to convert stands that currently provide thermal cover into an unsuitable condition. Thermal cover patches are associated with mountain bike trails where larger trees would be retained based on the trail construction description.

Current road density in the project area would not increase as no new roads are proposed. Existing densities are 2.02 miles per square mile would continue to be above 0.5 to 1.5 mi/mi^2 LRMP guidance for KEAs.

Providing interpretation material at the proposed trailhead describing the importance of winter range to big-game species and not encouraging the use of trails within the Ryan Ranch KEA (Ch. 2.6.1WL-RPM-4 and WL-RPM-5) are recommended to reduce potential impacts to big-game during the winter season. Increasing awareness of big-game habitat needs during the winter season can reduce some use of the area in the winter.

Alternative 3

As with Alternative 2 the primary impact to elk from this activity is the increase in non-motorized trails in the project area and Ryan Ranch KEA. Use of non-motorized trails can displace elk from an area in a similar manner as roads. Proposed trail decommissioning is the same for both alternatives and potential benefits are the same with limited benefit based on the trails being relocated rather than removed. Existing trails are heavily used and not covered under the Tumalo Winter Range Cooperative Closure since use is non-motorized. New technology (i.e. wider tires for winter mountain biking) is allowing increased access to elk in the winter.

This alternative proposes an additional 6.04 miles of non-motorized trail in the KEA which is a 12% increase of the existing designated trails in the KEA. This increase would change the non-motorized trail density from 1.49 mi/mi^2 to 1.63 mi/mi^2. Trail locations were identified in project planning to reduce some potential impacts to elk by keeping trails within approximately 150 feet of existing roads to reduce further habitat fragmentation.

The removal of Trail 2 from this alternative would improve elk movement between summer and winter grounds. Existing motorized and non-motorized routes would continue to alter elk movements but the lack of a mountain bike trail near FSR 41 would reduce potential human use in spring when road conditions may not allow travel but mountain bikes could use the trail.

Elk are known to move across FSR 41 between winter and summer grounds and there is an identified migration area just south of Trail 2. Use of a single trail may not be sufficient to alter elk movement but the additive effects of a new trail combined with the paved road and other existing trails may begin to impede elk movement. Additional trails may slightly alter elk movements, especially during trail construction, which can affect hunter success but hunting opportunities would continue to be provided in the project area.

Tree removal would not reduce hiding cover as there is none in the project area. The number of trees to be removed is not expected to convert stands that currently provide thermal cover into an unsuitable condition. Thermal cover patches are associated with mountain bike trails where larger trees would be retained based on the trail construction description.

Current road density in the project area would not increase as no new roads are proposed. Existing densities would continue to be above Forest Plan guidance.

Resource protection measures WL-RPM-4 and WL-RPM-5 are recommended to reduce potential impacts to big-game species during the winter period.

Cumulative Effects

The West Bend Vegetation Management project proposes removal of up to 292 acres of thermal cover (from thinning, mowing, and burning activities) in the Ryan Ranch KEA. All existing hiding cover would be maintained in the West Bend project. Road closures from other planning activities (Katalo East and West) are scheduled to be implemented as part of the West Bend decision and this would close user made roads and increase effectiveness of other closures on 44 miles in the West Bend project area. Implementation of these road closures are likely to occur within the next five years and would reduce the road density in the KEA. West Bend implementation would reduce elk thermal cover but is expected to increase forage availability and scheduled road closures would have a greater benefit to the species.

Ongoing recreation and proposed recreation in the area is contributing cumulative impacts to elk in the Ryan Ranch KEA. Non-motorized trails in the area are concentrated north of the Cascade Lakes Highway and east of FSR 41. Trail density in the KEA is 1.49 miles per square mile and many of these can be accessed year-round. These trails are not maintained for winter use but can be accessible during low snow years and as tire design allows for increased access through snow.

Conflicts can exist between hunters and other recreationist when non-motorized recreation (e.g. mountain biking) becomes the dominant activity in the area. As mountain biking popularity increases big game hunting opportunities can decrease because of disturbance to wildlife movements. While the area currently provides hunting opportunities, no restrictions are being placed on hunter access and opportunities would continue to be available.

Vegetation management activities and fuels reduction projects associated with West Bend and Katalo could occur during trail construction and use of the Welcome Station Connections project. Construction activities for this project would be short-term in elk habitat and primarily result in disturbance/displacement of individual. The loss of thermal cover associated with the West Bend project reduces some elk habitat quality in the project area but the increase in forage and effective road closures would benefit the species. Ongoing use of non-motorized trails would continue to reduce elk habitat effectiveness. Project design attempted to place trails close to existing roads to minimize impacts to elk. This project would contribute cumulative impacts to elk by increasing the non-motorized trail density in the KEA. This is not expected to be a large contribution as trail placement attempts to keep trails close to existing roads.

Determination

Implementation of either alternative would contribute a small negative trend to elk habitat on the DNF. The overall direct, indirect and cumulative impacts of the project would result in a small increase in habitat disturbance. This would be insignificant at the forest scale because elk populations are expected to remain stable across the DNF. With implementation of resource protection measures WL-RPM-4 and WL-RMP-5 this project is consistent with the Forest Plan.

Existing Condition for Mule Deer

Mule deer were chosen as a terrestrial MIS for its socio-economic importance to the hunting community within central Oregon. ODFW has established herd management objectives based on

winter population and annual herd composition. These management objectives were used to set these objectives for the Forest Plan (LRMP pg. 4-9). The Forest Plan has designated Management Area 7 (MA7) as mule deer winter range and everything else on the forest is considered summer range.

Mule deer populations may be migratory or non-migratory. Non-migratory deer can shift within their home ranges seasonally and share winter range with migratory deer. Migrating deer may move through the summer and winter ranges of other deer, which complicates interpretation of distribution and movement patterns.

Migratory mule deer exhibit high fidelity to summer and winter ranges. Deer tend to follow broad corridors during migration as influenced by topographic features, which become less distinct as the distance from winter range increases. Transition ranges often become important for weight gain during migration. Winter range, corridors, and transition areas may be important to mule deer survival in severe winters, thus need to be evaluated for potential impact by development and other land use activities. Mule deer may experience resource competition from elk as their populations appear to be increasing in Oregon.

Human populations in central Oregon are increasing, which can lead to an increase in roads and infrastructure leading. This can fragment and reduced habitat quality for many species. Lower elevation deer and elk winter range areas closest to population centers are being converted into urban areas.

The ODFW began a study focusing on mule deer habitat selection between summer and winter range (East Slope Cascades Mule Deer Project). This work examines habitat selection between summer and winter range relating to various land uses, such as major highways, urban development, open road densities, OHV activity, vegetative treatments, and other human related alterations to the landscape. Results from data gathered from October 2005 to November 2010, showed the three primary factors for deer mortality which are poaching associated with open road densities, cougar predation, and deer mortality associated with vehicle traffic on Highways 97 and 31.

Wisdom et al. (2005) found mule deer showed little measurable response to off-road activities. Movement rates slightly increased during all off-road activities except during ATV use. Stankowich (2008) and Krausman et al. (2006) showed similar responses of mule deer. They found human foot traffic had more impact than other stimuli (vehicles, noise, and horseback) studied.

The project area includes 6,604 acres of mule deer habitat (MA7) as identified in the Forest Plan. This area is north of the Cascade Lakes Highway and extends east to the forest boundary.

The Tumalo Winter Range Cooperative Area Closure is on the eastern side of the project area. This is a cooperative area closure between the FS and ODFW. Motorized vehicle routes are restricted to designated routes between December 1 and April 1. This project does not increase designated motorized routes or authorize use of motorized routes in the Tumalo Winter Range area.

Alternative 2 has approximately 334 acres of potential habitat within 200 meters of the proposed trails and Alternative 3 has 334 acres of potential habitat within trail buffers.

Effects Analysis for Mule Deer

Direct and Indirect Effects

Alternative 1 – No Action

Ongoing impacts to mule deer from non-motorized recreation would continue at stable to slightly increasing rates. Existing seasonal road closures would continue to reduce vehicle traffic in the Tumalo Creek Cooperative Road Closure Area but this is not expected to reduce potential impacts from non-motorized recreation. Mule deer thermal and hiding cover would continue to be available under this alternative.

Alternative 2

The primary impact to mule deer from implementation of this alternative is the increase in non-motorized trail density in the project area from 3.21 mi/mi^2 to 3.50 mi/mi^2, a 9% increase. Trail obliteration would occur in mule deer range (MA7), the removal of these routes would not noticeably improve mule deer habitat conditions in the project area as these are short-trails and trail obliteration is associated with trail re-routing. During project development, trail placement emphasized staying within 100 to 150 feet of existing roads to reduce potential increased habitat fragmentation.

Increased human presence in the area can further displace mule deer that use the area for winter and transition range. This can alter deer utilization of the area with some potential for changes recreational hunting in the area. Hunting opportunities would continue to be present in the area but existing non-motorized recreation levels have reduced many of these opportunities already.

As described mountain bike trail construction would not remove larger trees in areas that are currently mapped as mule deer thermal or hiding cover. This alternative does not propose additional roads so the existing road densities would not increase. The larger parking lot proposed in this alternative is outside of mule deer range but could result in a slight increase in human presence based on the larger lot size. This increase is not likely detectable since the existing area receives parking and substantial use.

Alternative 3

Potential impacts to mule deer under this alternative are similar to Alternative 2. The primary impact is from the increased human presence on mule deer winter and transition range. Implementation of this alternative would increase non-motorized trail density in the project area from 3.21 mi/mi^2 to 3.50 mi/mi^2, a 9% increase. Trail obliteration is included in this calculation and the removal of these routes would not noticeably improve mule deer habitat conditions. The trails to be decommissioned and are short routes that are redundant and this alternative proposed new trails re-routes.

Increased human presence in the area can further displace mule deer that use the area for winter and transition range. This can alter deer utilization of the area with some potential for changes to recreational hunting in the area. Hunting opportunities would continue to be present in the area but existing non-motorized recreation levels have reduced many of these opportunities already.

As described mountain bike trail construction would not remove larger trees in areas that are mule deer thermal or hiding cover. This alternative does not propose additional roads so the existing road densities would not increase. The parking lot proposed in this alternative provides similar parking as currently available and potential increases in human presence associated with the lot design would be similar to existing levels.

Cumulative Effects

The West Bend Vegetation Management project proposes to treat between 800 and 1,500 acres of deer thermal cover. This requires a Forest Plan Amendment since the area is already below Forest

Plan standards for 40% of the area providing thermal cover. ODFW was involved during project development and the loss of thermal cover is expected to be offset with increases in quality hiding cover and potential forage opportunities. Deer thermal cover in the Welcome Station Trails Connection project is north of the Cascade Lakes Highway and mountain bike trail construction would not remove larger trees that would contribute to canopy cover needed for thermal cover. This project would not result/contribute to cumulative losses in thermal cover because project description does not include removal of larger trees that contribute to canopy closure. The West Bend Vegetation Management project does not include treatment of existing hiding cover.

Ongoing and proposed recreation in winter range would continue to displace deer. Non-motorized trails, while use is not encourages, are open to use during the winter when several motorized roads are closed. Mule deer can be displaced by persistent human presence on wintering grounds.

Road closures to be implemented within the West Bend project area would reduce existing road densities in the mule deer range (MA7) in the project area. Bringing the area closer to Forest Plan guidance. These closures would improve mule deer habitat conditions in the future. The Welcome Station Trails Connections project does not propose addition road closures beyond the West Bend Project so it does not directly contribute cumulative effects. However, the improved habitat conditions for mule deer with lower road density would offset some of the potential impacts from increased non-motorized trail use.

Vegetation management activities and fuels reduction projects associated with West Bend and Katalo could occur during trail construction and use of the Welcome Station Connections project. Construction activities for this project would be short-term in mule deer habitat and primarily result in disturbance/displacement of individuals. The loss of thermal cover associated with the West Bend project reduces some mule deer habitat quality in the project area but the effective road closures would benefit the species. Project design attempted to place trails close to existing roads to minimize impacts to mule deer. This project would contribute slight cumulative impacts to mule deer by increasing the non-motorized trail density. This is not expected to be a large contribution as trail placement attempts to keep trails close to existing roads.

Determination

Implementation of all the alternatives would contribute to a slight negative impact to mule deer viability on the DNF. Mule deer habitat would not be directly removed under the alternatives but increased human presence is expected to reduce habitat quality for mule deer using winter and transition ranges. The overall direct, indirect and cumulative impacts would result in a minor increase in habitat disturbance (<1% of the available habitat) and would be insignificant at the forest scale. With the implementation of resource protection measures WL-RPM-4 and WL-RPM-5 this project is consistent with the Forest Plan.

Existing Condition for Woodpeckers

Woodpeckers were identified as a group of species for MIS. Based on the available habitat and species biology the black-backed woodpecker, hairy woodpecker, Lewis' woodpecker, northern flicker, white-headed woodpecker, and Williamson's sapsucker have potential habitat near proposed activities in the action alternatives.

Black-backed Woodpecker

Black-backed woodpecker nests are often found in lodgepole pine trees approximately 89% of these nests were located in lodgepole pine stands with the remaining nests found in mixed conifer stands dominated by lodgepole pine. They tend to use the least decayed trees and snags for nesting.

Black-backed woodpeckers forage in all forest types that contain lodgepole pine. This species forages almost exclusively on larvae of bark beetles and woodborers. Prey is obtained from tree trunks primarily by scaling or flaking bark and excavating logs and the bases of large diameter trees. Woodpecker use declines 2 to 3 years after mortality when trees dry out and bark beetle levels decline.

This woodpecker has a strong association with prey abundance. The importance of increased food resources accounts for the ephemeral use of areas moving in a short time after disturbance with occupation for 3 to 5 years while bark beetles and woodborers are abundant. Abundance of woodborers was four times greater at occupied territories than available territories this species occupied territories with higher densities of mountain pine beetle infected trees than available territories.

Black-backed woodpecker nesting habitat was mapped using lodgepole pine dominated forests that include all lodgepole pine plant association groups (PAGs) in all seral stages in addition to other PAGs in the early and mid-seral stages where lodgepole pine is dominant. Recent fires (less than 5 years old) with stand replacement or mixed severity were also classified as habitat. There are 446,003 acres of potential black-backed woodpecker nesting habitat on the DNF. Threats to habitat include timber harvest, fire suppression, salvage of fire and bug-killed trees, and conversion of mature and old-growth forests to young stands with little decay.

Alternative 2 has approximately 271 acres of potential habitat within the 200 meters of proposed trails and Alternative 3 has 57 acres of potential habitat within trail buffers.

Hairy Woodpecker

Hairy woodpeckers are found in mixed conifer and ponderosa pine forests and use deciduous stands during the breeding season. They have been observed nesting in relatively open stands with low basal area, low stem densities and open canopies (39% canopy cover). Ponderosa pine is a preferred nest tree but they are known to nest in other species (lodgepole pine, western larch, Douglas-fir, and aspen) except grand fir. Most nests are in dead trees less than 5 years and preferred snags are 10 to 20 inches dbh.

Hairy woodpeckers use both live and dead trees for foraging and are abundant in recently post-fire burned areas. This species also has greater relative abundance in high severity areas than in moderate severity areas. The increase in hairy woodpecker relative abundance following fire may be due to an increase in bark and woodborer larvae. Abundance decreases with increasing burn age tapering off by years 4 to 7 as prey availability decreases.

Hairy woodpecker nesting habitat was mapped using mixed conifer, ponderosa pine, and lodgepole pine PAG in early, mid and late seral stages. In addition, stands had to have open characteristics and stand size had to range from 11 to 20 inches dbh in mixed conifer and ponderosa pine and range from 5to 20 inches dbh in lodgepole pine. Recent stand replacement fires less than 5 years old were added as habitat. Recent forest management activities that resulted in conditions other than described above were removed from potential habitat. There are an estimated 507,920 acres of hairy woodpecker nesting habitat on the DNF. The project area has portions of four subwatersheds (12th Field Hydrologic Unit) and the amount of hairy woodpecker habitat in each of these is presented in following table. The subwatersheds extend past the project area boundary but illustrate that there is substantial nesting habitat near the project area.

Table 3-9: Watershed and Subwatersheds within the Project Area

Watershed	Subwatershed	Acres
North-Unit Diversion Dam	Benham Falls-Deschutes River	10,400
	Lava Island Falls-Deschutes River	5,560
	Overtruf Butte-Deschutes River	14,785
Tumalo Creek	Lower Tumalo Creek	5,196

Alternative 2 has approximately 1,720 acres of potential habitat within the 200 meter buffer of proposed trails and Alternative 3 has 1,152 acres of potential habitat within trail buffers.

Lewis' Woodpecker

Biology and natural history of the Lewis' woodpecker is discussed in the Region 6 Sensitive Wildlife Species section.

Northern Flicker

The northern flicker nests in large diameter snags and live trees with moderate to heavy decay. The flicker frequently nests in ponderosa pine forest types, but would also nest in older juniper stands. Most studies have found flickers prefer to nest in open habitats characterized by low basal area, low canopy cover, large snags, and high herbaceous cover. Ponderosa pine stands provide nest sites adjacent to grasslands where flickers forage.

The northern flicker forages almost exclusively on the ground during the summer specializing on ants and beetle larvae. Foraging locations are characterized by short vegetation and bare ground with tall vegetation being uncommon. Foraging methods shift to excavating dead and down woody material in the fall. Flickers also excavated, pecked, gleaned, and harvested seeds in live and dead trees, down woody material, and stumps.

Northern flicker nesting habitat was mapped using plant association groups from juniper, lodgepole pine, ponderosa pine, grand/white fir, and Douglas-fir in all seral stages. Stand size had to be a minimum diameter of 10 inches in lodgepole pine and 15 inches in all other PAGs with open stand characteristics. There are approximately 219,576 acres of potential northern flicker nesting habitat on the Forest.

Alternative 2 has approximately 852 acres of potential habitat within the 200 meters of proposed trails and Alternative 3 has 382 acres of potential habitat within trail buffers.

White-headed Woodpecker

Biology and natural history of the white-headed woodpecker is discussed in the Region 6 Sensitive Wildlife Species section.

Williamson's Sapsucker

The Williamson's sapsucker is included with the woodpecker group which was chosen as an MIS for the DNF. This group was chosen to represent all wildlife species that use cavities for nesting and denning. The woodpeckers, as well as many of the secondary cavity nesters, consume forest insects thereby contributing a valuable suppression influence on destructive forest pests.

Williamson's sapsuckers occur in older forest interior ponderosa pine, aspen, cottonwood-willow. Forest stands that are single and multi-strata grand/white fir and interior Douglas-fir also provide habitat. In central Oregon, sapsucker densities were much greater in lightly harvested areas compared to intensively harvested stands; while nests were located in managed stands, they were generally found in denser patches of forest containing high snag densities.

Although this species is highly adaptable and able to withstand considerable disturbance (Marshall et al. 2003), it is likely that the decay condition (i.e. heartwood decay), structural characteristics (such as tree diameter and height), and abundance of suitable nest trees are limiting factors influencing distribution and abundance in some areas of their range (Cooper and Manning 2004). Primary threats include forest management practices or activities that remove large snags and the impacts of fire suppression (Dobbs et al. 1997, Wisdom et al. 2000, Marshall et al. 2003, and Cooper and Manning 2004).

There are a total of 14,805 acres of suitable Williamson's sapsucker habitat in the North Unit Diversion Dam-Deschutes River watershed or 6% of the 243,364 total acres of habitat forest-wide.

Alternative 2 has approximately 745 acres of potential habitat within the 200 meters of proposed trails and Alternative 3 has 332 acres of potential habitat within trail buffers.

Effects Analysis for Woodpeckers

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects to all MIS woodpecker species. Existing habitat conditions would remain as presently available for all woodpecker species.

Alternative 2 and Alternative 3

Construction activities and use of the proposed trails has the potential for nest disturbance. Snags are not targeted for removal unless they present a safety concern; field reconnaissance of the trails did not identify any snags as a safety hazard so the potential need for removal should be infrequent. There is still a possibility that snags may need to be removed, which could reduce nesting or foraging opportunities for individual woodpecker territories. This reduction cannot be calculated as acres removed based on the potential removal and would not be noticeable on a landscape scale. Most woodpeckers are tolerant of human presence near nests so ongoing use of these trails is not expected to displace nesting individuals. There may be cases where individual nests are disturbed during construction, maintenance and use of the trails but considering the availability of snags in the area this would also be an infrequent occurrence. This project has potential to directly and indirectly impact woodpeckers though infrequent removal of snags and possible nest disturbance during construction. Both of these are expected to be infrequent because snags are not abundant near the proposed routes.

Resource protection measure, WL-RPM-1 recommends retention of all snags unless they present a safety concern. Even if some snags needed to be removed for safety purposes the area would continue to provide woodpecker nesting and foraging opportunities. Resource protection measure WL-RPM-2 specifically protects Lewis' woodpecker nest boxes on the eastern side of the project area from disturbing activities during the nesting season. Potential disturbance to woodpecker species is reduced through WL-RMP-1 and WL-RMP-2.

Cumulative Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects; therefore, there would be no cumulative effects to woodpecker species from this alternative.

Alternative 2 and Alternative 3

The West Bend Vegetation Management project proposes harvest between 12,000 and 14,000 acres of various treatments. This type of activity has the potential to directly impact woodpeckers but the long-term benefit for Lewis' and white-headed woodpecker are described in the FEIS. Resource protection measure WL-RPM-90 from the West Bend FEIS describes retention of snags and green tree replacements of 15 inches dbh or greater to be retained at 100% maximum potential populations and to maintain those above 10 inches dbh for lodgepole pine.

Past vegetation management activities (Katalo East/West and East Tumbull) are accounted for in the habitat modeling so these changes are included in the baseline. Recreation activities are not expected to contribute cumulative impacts to woodpeckers.

Large fire history in the project area shows several fires that are older and probably providing some foraging and nesting habitat for woodpeckers but the initial abundance of prey has subsided and these areas provide sub-optimal habitat.

Vegetation management activities and fuels reduction projects associated with West Bend and Katalo could occur during trail construction and use of the Welcome Station Connections project. There could be a combined impact if these actions occur simultaneously. Since the Welcome Station Connections project is not expected to substantially impact woodpeckers it is not expected to contribute cumulative impacts in the project area.

Determination

Viability determinations for individual woodpecker species are provided below.

Implementation of Alternative 1 would not reduce the viability of woodpecker species on the DNF. There would be no change in existing habitat available to this group of species.

Implementation of Alternatives 2 and 3 would result in a slight negative impact to woodpecker viability across the DNF. The overall direct, indirect and cumulative impacts would result in a small amount of habitat disturbance (<1% of the available habitat) that would be insignificant at the Forest scale. The Welcome Station Connections project is consistent with the Forest Plan and continued viability of all woodpecker species analyzed is expected on the DNF.

Species	Alternative 1	Alternative 2 and Alternative 3
Bald eagle	No Impact	No Impact
Townsend's big-eared bat	No Impact	No Impact
Fringed myotis	No Impact	No Impact
Lewis' woodpecker	No Impact	May Adversely Impact Individuals
White-headed woodpecker	No Impact	May Adversely Impact Individuals

Northwest Forest Plan Survey and Manage Species

Northwest Forest Plan requires that certain species be surveyed prior to ground-disturbing activities so that the location of these rare species can be considered in the design of the projects. None of the proposed activities occur within the Northwest Forest Plan area so surveys were not conducted for species on the 2001 list because no habitat would be disturbed. Surveys have been conducted for a known great gray owl territory outside of the Northwest Forest Plan area but within the project area. This nest has been surveyed to protocol since 2009 with no activity recorded. Potential impacts to this species are discussed in the Management Indicator Species section above.

This project conforms with the January 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (2001 ROD S&Gs).

Migratory Birds

Executive Order 13186 directs federal agencies to avoid or minimize the negative impact of their actions on migratory birds, and to take active steps to protect birds and their habitat (Federal Register 2001). The Forest Service and U.S. Fish and Wildlife Service have a Memorandum of Understanding (FS Agreement #08-MU-1113-2400-264) with the purpose, "to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds through enhanced collaboration between the Parties, in coordination with the State, Tribal and local governments."

The Forest Service has agreed to evaluate the effects of agency actions on migratory birds, focusing first on species of management concern along with their priority habitats and key risk factors. This document addresses potential impacts to Birds of Conservation Concern and focal species as identified by Landbirds of the East-slope of the Cascades (Altman 2000).

Birds of Conservation Concern

The Birds of Conservation Concern (USFWS 2008) identifies species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing under the ESA. The goal is to conserve avian diversity in North America and includes preventing or removing the need for additional ESA bird listings by implementing proactive management and conservations actions (USFWS 2008). Conservation concerns stem from population declines, naturally or human-caused small ranges or population sizes, threats to habitat, or other factors. This project is in Bird Conservation Region 9 – Great Basin.

Table 3-10 Birds of Conservation Concern for Region 9 – Great Basin

Species	Preferred Habitat
Yellow-billed loon	Winters along the Pacific Coast with transients found on inland bodies of water.
Greater sage-grouse (Columbia Basin DPS)	Sagebrush obligate, found east of Cascade crest. Requires large expanses of sagebrush with healthy native grasses and forbs.
Eared grebe	Shallow alkaline lakes and ponds where open water is intermixed with emergent vegetation.
Black Swift	Nests on ledges or shallow caves in steep roc faces and canyons. Usually near or behind waterfalls and sea caves. Forages over forests and open areas in montane habitats.

Species	Preferred Habitat
Calliope Hummingbird	Predominately montane open shrub sapling seral stages (8-15 years) at higher elevations and riparian areas.
Lewis' woodpecker	Ponderosa pine, cottonwood riparian area, or oak savannahs with open canopy, brushy understory and dead/down material. Also larger post-burn environments.
Williamson's sapsucker	East Cascades in middle to higher elevations of mature mixed conifer or deciduous forests. Snag dependent species.
White-headed woodpecker	Old-growth Ponderosa pine and open habitats where standing snags and scatter tall trees remain.
Willow Flycatcher	Riparian shrub dominated habitat, especially brushy/willow thickets.
Loggerhead Shrike	Grassland pasture with fences or sagebrush with scatter juniper woodlands. Requires perches for hunting and nesting.
Pinyon Jay	Pinyon-juniper woodland, sagebrush, and scrub oak habitats.
Sage Thrasher	Large patches of sagebrush/bitterbrush with shrub height usually 30-60cm high.
Virginia's Warbler	High elevation steep-sloped, xeric, pinyon-juniper or oak woodlands.
Green-tailed Towhee	Shrub-stands with high diversity interspersed with trees.
Brewer's Sparrow	Contiguous stands of big sagebrush, greasewood, and rabbitbrush.
Black-chinned Sparrow	Infrequently in ceanothus and oak hillsides of SW Oregon.
Sage Sparrow	Southeast and central Oregon in semi-open evenly spaced shrubs up to 6,800 feet.
Tricolored Blackbird	Hardstem bulrush, cattail, willows wetlands.
Black-rosy Finch	Bare rock outcrops, cliffs, and hanging snowfields above timberline.
Bald Eagle	Large water bodies and nearby forested areas.
Ferruginous Hawk	Sagebrush plains and bunchgrass prairie of the high desert and Blue Mountains.
Golden Eagle	Shrub-steppe, grassland, juniper, and open Ponderosa pine with open areas for hunting.
Peregrine Falcon	Wide range of habitat including cliffs, bridges, rock quarries.
Yellow Rail	Shallow flooded sedge meadows at 4,100-5,000 feet with vegetative cover near 50%.
Snowy Plover	Eastern Oregon summer resident breeding on alkali flats and salt ponds.
Long-billed Curlew	Open grassland east of Cascades.
Marbled Godwit	Migrant along the Pacific Coast preferring mudflats, sandy beaches, wet margins on large reservoirs.
Yellow-billed Cuckoo	No known breeding populations in Oregon. Large riparian forests, especially black cottonwood, Oregon ash and willow.

Species	Preferred Habitat
Flammulated Owl	Ponderosa pine forest and mixed conifer stands with a mean 67% canopy closure, open understory with dense patches of saplings or shrubs.

The project area only provides habitat for the flammulated owl. Woodpecker species listed as Birds of Conservation Concern have been analyzed as in the Region 6 Sensitive Species or Management Indicator Species sections above.

Existing Condition for Flammulated Owl

Flammulated owls are a focal species of grassy openings and dense thickets within late-successional mixed conifer plant associations. Predicted habitat for this species occurs throughout the project area and there is one documented individual near Kiwa Springs at the southwestern edge of the project area.

Conservation issues for this species include: loss of mature and old-growth trees and snags for nest and roost sites; loss of open understory because of invasion of exotics and fire intolerant species; requires small patches of dense thickets for roosting; creation of large areas of even-aged stands is detrimental; fuelwood collection reduces the densities of snags (Altman 2000).

Landbirds of the East-slope of the Cascade Mountains

The conservation strategy for landbirds of the east-slope of the Cascade Mountains in Oregon and Washington (Altman 2000) identifies priority habitat features for focal species. Focal habitat includes ponderosa pine, mixed-conifer, lodgepole pine, whitebark pine, meadows, aspen, and subalpine fir. The project area has ponderosa pine, lodgepole pine and mixed conifer habitat available.

Table 3-11: Priority Habitat Features and Associated Focal Species for the East-Slope Cascade Strategy

Habitat	Habitat Feature	Central Oregon Focal Species
Ponderosa Pine	Large patches of old forest with large snags	White-headed woodpecker
	Large trees	**Pygmy nuthatch**
	Open understory with regenerating pines	**Chipping sparrow**
	Patches of burned old forest	Lewis' woodpecker
Mixed Conifer	Large trees	Brown creeper
	Large snags	Williamson's sapsucker
	Interspersion grassy openings and dense thickets	Flammulated owl
	Multi-layered/dense canopy	Hermit thrush
	Edges and openings created by wildfire	Olive-sided flycatcher
Lodgepole Pine	Old growth	Black-backed woodpecker
Whitebark Pine	Old growth	Clark's nutcracker

Habitat	Habitat Feature	Central Oregon Focal Species
Meadows	Wet/dry	Sandhill Crane
Aspen	Large trees with regeneration	Red-naped sapsucker
Subalpine Fir	Patchy presence	Blue Grouse

The migratory bird species in the above table that are bolded are analyzed in more detail below. The project area has mixed conifer habitat none would be affected by the proposed activities. Species associated with Ponderosa pine and lodgepole are be considered. Woodpecker species listed in these two forest types were analyzed in the above sections. Flammulated owls was been addressed as a Bird of Conservation Concern (USFWS 2008) and the pygmy nuthatch and chipping sparrow are to be addressed as focal species in the Landbirds of the East-slope of the Cascades (Altman 2000).

Existing Condition for Pygmy Nuthatch

Pygmy nuthatches are cavity nesters and although they can utilize smaller and well-decayed ponderosa pine snags, pygmy nuthatches do compete with other cavity nesters such as the white-breasted nuthatch and white-headed woodpecker for ponderosa pine snags. Snags are limiting in the project area; and it is this aspect of their habitat needs that may be adversely impacted rather than the general habitat type of ponderosa pine.

The desired condition in ponderosa pine forest is a large tree, single layered canopy with an open, park-like understory dominated by herbaceous cover with scattered shrub cover and pine regeneration (Altman 2000).

Conservation strategies for this species include the following: a) managing for large diameter trees through wider tree spacing and longer rotation periods, b) eliminate or restrict fuelwood cutting in suitable or potential habitat, and c) retain all snags >10 inches dbh and all Ponderosa pine trees >17 inches dbh.

Existing Condition for Chipping Sparrow

Chipping sparrows are a focal species of open Ponderosa pine stands with active regeneration. They nest relatively close to the ground in young pine trees 4 to 8 feet tall. Their habitat is limited by the more even-aged, tall, and high density stand structure of the proposed treatment units.

Conservation strategies for this species include the following: a) evaluate historical plant communities and current landscape conditions when assessing where restoration activities should occur, b) conduct understory removal and burning outside of the nesting season (April 15 to July 15), and c) conduct thinning and/or overstory removal to provide suitable open conditions.

Effects Analysis for Migratory Birds and Landbirds of the East-slope of the Cascade Mountains

Direct and Indirect Effects

Alternative 1 – No Action

Implementation of this alternative would not reduce habitat for any of the Bird of Conservation Concern or Landbird species discussed above.

Alternative 2 and Alternative 3

Flammulated owl habitat exists throughout the project area, but there are no observations of the species near any of the proposed trails. Potential large trees and snags would be retained and there is no mixed conifer habitat that would be removed during implementation.

Pygmy nuthatch habitat also exists in the project area with one recorded nest. All large trees and snags are expected to be retained and be available for current and future nesting habitat for the species. Fuelwood cutting is not allowed in the project area boundary. There is some potential for individual nest disturbance during implementation however, this area receives substantial recreation use and resident birds are expected to be acclimated to higher levels of human presence.

Chipping sparrows are expected to occur in the project area with habitat primarily on the eastern side. The area with the most potential to support chipping sparrow is near the portion of Trail 1 where the existing old road would be paved and trees are not planned for removal.

Cumulative Effects

Alternative 1 – No Action

The no action alternative would have no direct or indirect effects; therefore, there would be no cumulative effects to northern goshawk from this alternative.

Alternative 2 and Alternative 3

Potential cumulative impacts to these species are primarily from implementation of the West Bend project. This project was determined to be consistent with the Altman (2000). The West Bend project has potential for long-term benefits to flammulated owl, pygmy nuthatch and chipping sparrow as timber management activities would promote larger diameter ponderosa pine. Ongoing recreation is not expected to contribute cumulative impacts to these species because flammulated owls are nocturnal and not active during peak use periods and pygmy nuthatch and chipping sparrow habitat would remain as currently available.

Determination

The potential impacts to migratory birds listed as Birds of Conservation Concern or focus species in the East Slope Cascade Landbird Strategy are minimal from any of the alternatives. Habitat for these species would remain and features such as large trees and snags would be retained. The project is consistent with conservation strategies in the East Slope Cascade Landbird Strategy (Altman 2000).

High Priority Shorebirds

The U.S. Shorebird Conservation Plan identified U.S. and Canadian shorebird populations that are considered highly imperiled or of high concern (U.S. Shorebird Conservation Plan 2004). The 2004 list (below Table) updated the initial list from 2001 and created a list of seven highly imperiled and 23 high priority shorebird populations. The list is grouped into global species and North American populations. Global species are those with their entire range restricted to the U.S. and Canada and North American populations are a concern in North America but the species does occur in other areas. Most of these species do not regularly occur on the Deschutes National Forest and when they do habitat is typically restricted to larger water bodies.

Table 3-12: High Priority Shorebird Species and Populations

Priority	Shorebird Species
Highly Imperiled	Global Species
	Piping Plover
	Mountain Plover
	Long-billed Curlew
	Buff-breasted Sandpiper
	North American Populations
	Snowy Plover
	Black-necked Stilt (Hawaiian population)
	Red Knot (Canadian Arctic-Atlantic Coast Population)
High Concern	**Global Species**
	American Golden-Plover
	Black Oystercatcher
	Solitary Sandpiper
	Upland Sandpiper
	Bristle-thighed Curlew
	Hudsonian Godwit
	Marbled Godwit
	Black Turnstone
	Surfbird
	Western Sandpiper
	Rock Sandpiper
	Short-billed Dowitcher
	American Woodcock
	Wilson's Phalarope
	North American Populations
	Wilson's Plover
	American Oystercatcher
	Whimbrel
	Bar-tailed Godwit
	Ruddy Turnstone
	Red Knot (Populations other than Canadian Arctic-Atlantic Coast Population)
	Sanderling
	Dunlin (Alaska-East Asian and Alaska-Pacific Coast Populations)

Based on the ecology and natural history of the species listed above the only habitat available is adjacent to the Deschutes River and the Ryan Ranch Meadow in the eastern portion of the project area. There are no other large meadows or water bodies. There is no habitat for shorebirds within 200 meters of any of the proposed activities in the action alternatives.

Effects Analysis for Shorebirds

Direct and Indirect Effects – All Alternatives

The project area does not provide habitat for any of the shorebird species listed in the above table. Implementation of any of the alternatives would not directly or indirectly affect any high priority shorebird species.

Cumulative Effects – All Alternatives

In the absence of direct or indirect impacts no cumulative impacts to high priority shorebirds are anticipated.

Summary of Alternatives and Effects

In general, the potential impacts to most wildlife species are similar between the action alternatives. The difference between alternatives is associated with the reduction in non-motorized trail with the removal of Trail 2 in Alternative 3.

Region 6 Sensitive Species

Table 3-13: Region 6 Sensitive Species*

Species	Alternative 1	Alternative 2	Alternative 3
Bald eagle	NI	NI	NI
Townsend's big-eared bat	NI	NI	NI
Fringed myotis	NI	NI	NI
Lewis' woodpecker	NI	MAINL	MAINL
White-headed woodpecker	NI	MAINL	MAINL

* NI – No impact; MAINL – May adversely impact individuals

Management Indicator Species

Table 3-14: MIS Comparison of Alternatives*

Species	Alternative 1	Alternative 2	Alternative 3
Bald eagle	NRV	NRV	NRV
Northern goshawk	NRV	SRV	SRV
Cooper's hawk	NRV	SRV	SRV
Sharp-shinned hawk	NRV	SRV	SRV
Great gray owl	NRV	SRV	
Great blue heron	NRV	NRV	NRV
Red-tailed hawk	NRV	SRV	SRV
Osprey	NRV	NRV	NRV
Elk	SRV	SRV	SRV
Mule deer	SRV	SRV	SRV
Black-backed woodpecker	NRV	NRV	NRV

Species	Alternative 1	Alternative 2	Alternative 3
Hairy woodpecker	NRV	NRV	NRV
Lewis' woodpecker	NRV	SRV	SRV
Northern flicker	NRV	NRV	NRV
White-headed woodpecker	NRV	SRV	SRV
Williamson's sapsucker	NRV	NRV	NRV

* NRV – no reduction in viability on the DNF; SRV – slight reduction in viability but the species would remain viable across the DNF

Forest Plan Compliance

With the described resource protection measures (Ch. 2.6.1), this project is in compliance with direction (standards and guidelines) in the Deschutes National Forest Land and Resource Management Plan (USDA FS 1990).

3.4.3 SCENERY

This section covers the existing conditions and effects of implementation on scenery resources. This section incorporates by reference the Scenery Resource Report contained in the project record located at the Bend-Fort Rock Ranger District. A summary of the existing condition and predicted effects of the alternatives are discussed in this section.

Introduction

The proposed activities for this project would parallel the Cascade Lakes Scenic Byway (FSR 46) starting near the City of Bend limits providing connecting to the Welcome Station, Wanoga, and Phil's trail systems.

Existing Condition

The proposed project is at a much smaller scale than the project area boundary (Ch. 1.7.1, Figure 1-3). The larger project area boundary serves to encompass all the trail systems proposed trails could provide connections too. Proposed activities would only occur in three management allocations. Project activities are within the following management areas:

- MA7 Deer Habitat – 6.9 miles of trail construction
- MA9 Scenic Views – 6.2 miles of trail construction and obliteration
- MA11 Intensive Recreation – 5 miles of trail and trailhead construction

In the project area, 5,425 acres are within the Scenic Views Management Area. These areas are classified as:

- High Scenic Integrity (Scenery Management System) and Retention-Foreground (Vicual Management System) which are 0 to ¼ mile along the Cascade Lakes National Scenic Byway (Highway 46),

- Moderate Scenic Integrity (SMS) and Partial Retention (VMS) along Forest Road 41 and the areas between Cascade Lakes National Scenic Byway and Forest Road 41,
- and High Scenic Integrity (SMS) and Retention-Foreground (VMS) in the recreation site areas along the west side of the Deschutes River.

Also included in the project area are 1,844 acres within the Wild and Scenic River Management Area in the Recreation segment (from the FS boundary on the north to Meadow and Lava Island) and the Scenic segment (from Lava Island to Big Eddy, Aspen, Dillon Falls, and Slough on the south). This segment was designated for its outstanding remarkable values for scenery and recreation. With the exception of developed sites, segments with Scenic River classification would be managed to meet a High Scenic Integrity Level (Scenery Management System) or Retention (Visual Management System).

Trail and trailhead construction is outside the Wild and Scenic River Management Area. Segments within Recreation River classification would be managed to provide interpretive programs that improve public awareness and understanding of Outstandingly Remarkable Values. Wildlife interpretation for this area would focus on habitat protection, species that wildlife viewers would have a high likelihood of seeing, and educating the public in the importance of wetlands, meadows, snags, and other unique habitats.

The proposed activity for this project would be within a scenic travel corridor and would add to providing access to multi-modal alternative forms of transportation connecting communities. The visitor experience would be enhanced on foot or bike with an opportunity to travel safely through a landscape that was previously dominated and more advantageous to motorized vehicles. Interpretive features and information located at kiosks would provide visitors with orientation and direction for their activities.

Effects Analysis

Direct, Indirect and Cumulative Effects

Alternative 1 – No Action

Under this alternative, there would be no planned non-motorized paved path and trailhead between Bend and the Cascade Lakes Scenic Byway Welcome Station (Welcome Station) and no key mountain bike trails connecting the Welcome Station to the Wanoga, Phil's and Deschutes River trail systems. The dispersed parking that is occurring would continue to be a negative impact to scenic quality as viewed from the Cascade Lakes Highway.

Alternative 2 and Alternative 3

Direct and Indirect

Proposed trails would be adjacent to and around the Cascade Lakes Highway and the Welcome Station. These trails would establish the Welcome Station as a portal to public lands by providing connections between established biking and hiking trail networks and creating opportunities for multi-modal access and alternative forms of transportation between the City of Bend and public lands. The new gravel trailhead parking area would be located on the south side of Cascade Lakes Highway approximately 0.5 miles west of the forest boundary with the City of Bend. This interpretive site is listed as a high priority project in the Cascade Lakes National Scenic Byway Corridor Management Plan (2011).

The access road to the trailhead would be curved and the parking area perpendicular to the Cascade Lakes Highway to minimize the width and duration of the view that visitors have when passing the trailhead while on the highway. A kiosk on the south end of the parking area would provide interpretive and recreation information. The parking area would be designed in pods to maintain and preserve as much of the existing vegetation to provide screening from the highway and shade for users. Alternative 2 proposed to construct 40 spaces covering approximately 30,000 square feet while Alternative 3 proposes to construct 22 spaces coving approximately 15,000 square feet.

The trailhead parking area would meet standards and guidelines for scenic quality with screening due to site design layout and preserving existing large ponderosa pine and clusters of smaller and medium sized trees. The kiosk at the trailhead would meet standards and guidelines for scenic quality by using colors and design graphics examples described in the Cascade Lakes National Scenic Byway Corridor Management and Interpretive Plan (2011). Figure 3-7 provides an example an existing kiosk along the Cascade Lakes Highway; the proposed kiosk would follow a similar design.

Figure 3-7: Example of Cascadian-style Kiosk on the Cascade Lakes National Scenic Byway

The 3.4 mile non-motorized paved path parallels the Cascades Lakes Highway providing connecting from the Bend Metro Parks and Recreation District Haul Road trail (city limits) to the Welcome Station via the undercrossing.

The paved path would meet standards and guidelines for scenic quality because it is designed to provide an alternative form of non-motorized transportation that is removed from the roadway, provides accessibility, protect site resources and would enhance scenic views with the use of materials that blend with the surrounding landscape. Signing would also meet standards and guidelines for scenic quality if minimal and constructed with materials that are not shiny or reflective using colors that complement the surrounding landscape and painting the backs of the signs a neutral color and posts a dark color.

This project proposes to enhance and re-vegetate the existing undercrossing improving its current appearance to meet standards and guidelines for scenic quality. Plantings and terracing would meet standards and guidelines for scenic quality because the materials used would blend with the surrounding landscape and screening in the form of earth berms and native vegetation would provide screening from the Cascade Lakes Highway. Site revegetation and constructing of terrace planting areas with finished grades would prevent erosion and hazardous drainage problems that may result in long-term maintenance issues for the paved path.

Scenery is identified as an ORV in the Upper Deschutes Wild and Scenic River Plan due to the mix of geologic, hydrologic, vegetative, and wildlife resources in this segment. Proposed activities are outside of the wild and scenic river corridor, there are no direct or indirect effects to this management area or its outstanding remarkable values.

Cumulative Effects

Recreational use, once the Welcome Station has been constructed, would likely increase because the Welcome Station would be a hub for the existing hiking and biking trail systems that would allow extended travel and recreation to other communities or recreation areas on and adjacent to the Deschutes National Forest. The Welcome Station, existing recreational use combine with the proposed trailhead and trail connections along Cascade Lakes Highway would draw more users to the area and increase activity at existing trail systems, the Welcome Station and proposed trailhead and trail connectors. Past, ongoing, and proposed activities are consistent with Forest Plan standards and guides for scenery and other management direction (ROS) for scenic resources; therefore, this project would have no cumulative effect.

3.4.4 BOTANY

This section covers the existing conditions and effects of implementation on botanical resources. This section incorporates by reference the Botany Biological Evaluation contained in the project record located at the Bend-Fort Rock Ranger District. Specific information on methodologies, assumptions, plant species, and other details are contained in the report. A summary of the existing condition and predicted effects of the alternatives are discussed in this section.

Introduction

A biological evaluation to document consideration of Threatened, Endangered, and Sensitive (TES) plant species was prepared in compliance with FSM 2672.4 and the Endangered Species Act of 1973 (Subpart B; 402.12, section 7 consultation). Project effects are evaluated for those TES plant species on the current Regional Forester's Sensitive Species List (FSM 2670.44, December, 2011) that are documented or suspected to occur on the Deschutes National Forest.

The project area is within a ponderosa pine/bitterbrush/Idaho fescue plant association. The elevation is approximately 4,000 feet with an annual precipitation range from 12 to 50 inches. The soils are composed of sandy volcanic ash over pumice lapilli.

Existing Condition

There are no known Proposed, Endangered, Threatened, or Sensitive (PETS) plant species within the project area, or in the immediate vicinity. District records were referenced for previously known TES plant populations, suitable habitat was identified and field reconnaissance, at the proper time of year when TES plant species in question would be found, was performed to try to locate populations within the project area.

Effects Analysis

Direct, Indirect and Cumulative Effects

Alternative 1 – No Action

There would be no direct or indirect effects to botanical resources since proposed activities would not occur and there are no PETS plant species within the project area. Since no direct or indirect effects would occur there is no overlap in time and space with activities and effects therefore there would be no cumulative effects.

Alternative 2 and Alternative 3

No known PETS plant species exist within the project area therefore there would be no direct, indirect, or cumulative effects from the action alternatives. Since there are no direct or indirect effects to overlap in time and space with past, present, and reasonably foreseeable future projects there would be no cumulative effects.

3.4.5 INVASIVE PLANTS

This section covers the existing conditions and effects of implementation on invasive plants. This section incorporates by reference the Invasive Plant Risk Assessment Report contained in the project record located at the Bend-Fort Rock Ranger District. Specific information on methodologies, assumptions, consistency with Forest Plan, and other details are contained in the report. A summary of the existing condition and predicted effects of the alternatives are discussed in this section.

Introduction

The project area is within a ponderosa pine/bitterbrush/Idaho fescue plant association. The elevation is approximately 4,000 feet with an annual precipitation range from 12 to 50 inches. The soils are composed of sandy volcanic ash over pumice lapilli.

Aggressive non-native plants, or noxious weeds, can invade and displace native plant communities causing long-lasting management problems. Noxious weeds can displace native vegetation, increase fire hazards, reduce the quality of recreational experiences, poison livestock, and replace wildlife forage. By simplifying complex plant communities, weeds reduce biological diversity and threaten rare habitats.

Forest Service Manual 2080 Noxious Weed Management requires that noxious weed assessments be prepared for all projects involving ground-disturbing activities. For projects that have a moderate to high risk of introducing or spreading noxious weeds, Forest Service policy requires that decision documents must identify noxious weed control measures that would be undertaken during project implementation (FSM 2081.03).

With its close proximity to town, private property, and high-use recreation sites, the project area is located in one of the most highly infested areas on the Bend-Fort Rock District with regards to noxious weeds.

Risk Ranking

Factors considered in determining the level of risk for the introduction or spread of noxious weeds are:

__X__ HIGH

Has to be a combination of the following three factors:

1. Known weeds in/adjacent to project area.
2. Any of vectors* #1-8 in project area.
3. Project operation in/adjacent to weed population.

_____ MODERATE

Any of vectors #1-5 present in project area.

_____ LOW

1. Any of vectors #6-8 present in project area; or
2. Known weeds in/adjacent to project area without vector presence.

*__Vectors__ (if contained in project proposal) ranked in order of weed introduction risk:

1. Heavy equipment (implied ground disturbance)
2. Importing soil/cinders
3. OHV's
4. Grazing (long-term disturbance)
5. Pack animals (short-term disturbance)
6. Plant restoration
7. Recreationists (hikers, mountain bikers)
8. Forest Service project vehicles

Discussion of Ranking

A risk ranking of high is appropriate because there would be heavy equipment working at a known weed sites. Machinery has the potential to spread seeds present in the seedbank, although at least some of the seedbank would be paved.

Existing Condition

Several weed sites intersect proposed trails and trailheads. The weeds of concern are spotted knapweed, dalmation toadflax, Medusahead, and common mullein.

There are two spotted knapweed sites in the project area, which amount to over 40 acres. These two sites are located near some of the most ground disturbing work around the Welcome Station.

Most of the sites are limited to manual removal at this time; the sites that are authorized for herbicide treatment, under the Deschutes and Ochoco Invasive EIS, include the Cascade Lakes Highway corridor and the two sites adjacent to the Seventh Mountain Resort, which are the Medusahead site and a large spotted knapweed site.

Existing weed sites are currently being treated or would be treated as follows:

- Spotted knapweed, the most ubiquitous weed on the District and very dominant in the project area, has been either treated chemically or pulled manually. All spotted knapweed sites

would be proposed for herbicide and, if approved by the Noxious Weed Interdisciplinary Team, sites would receive treatment beginning spring or summer of 2014.

- Dalmation toadflax (*Linaria dalmatica* or LIDA) is currently being treated through a biocontrol, a stem-boring weevil called *Mecinus janthinus*. The presence of the biocontrol was noted on all dalmation toadflax populations in the project area. The weevil has impacted the health and vigor of the plants, but would not kill the plant entirely. Because the weevil targets the stems and leaves, the plant would still reproduce through seeds and rhizomatous growth, however the stress from the weevil has slowed the reproductive progress. The plants in the project area have not been manually removed in the past two to three years to allow the establishment of the biocontrol. None of the dalmation toadflax populations have been approved for chemical treatment. For the purposes of this project and the prevention of spread, all dalmation toadflax populations would be treated with herbicide by the summer of 2014, if approved by the Noxious Weed Interdisciplinary Team.

- Medusahead (*Taeniatherum caput-medusae* or TACA8) is a priority for control on the District. There are only four, relatively small (less than 2 acres) documented sites on the district. The one Medusahead site in this project area is adjacent to the Seventh Mt. Resort and along the forest access trail used by the resort's customers; the site is approximately .10 acres in size. A mitigation measure is included to close this trail in order to contain this site and further prevent the spread of this aggressive, annual grass. The site is approved for herbicide and has been sprayed in the past; treatments are planned for the future.

- Common mullein (*Verbascum thapsus*) is not on the Deschutes National Forest Noxious Weed list but is considered a non-native, invasive plant of concern. The plant establishes readily in open and disturbed ground, but is shade intolerant and not considered a serious threat to native vegetation. Therefore, sites are not heavily documented but its establishment is noted near the Welcome Station and where found, it would be removed.

Table 3-15: Where Noxious Weeds Intersect with Proposed Trail Segments

Noxious Weed	Trail Segment	Site Location
Spotted knapweed	1a	Along paved path and adjacent to the Entrada Lodge
Spotted knapweed and Dalmation toadflax	1a	Along paved path between Entrada and trailhead
Spotted knapweed	1a	FRS 4600101 southwest of trailhead
Spotted knapweed	Trailhead	Trailhead
Spotted knapweed and Dalmation toadflax	Trail 6	North of trailhead
Spotted knapweed and Dalmation toadflax	1a 1b 3c 5c	East of the Welcome Station intersecting multiple trail segments
Spotted knapweed	2a 2b	Adjacent to Cascade Lakes Highway, Seventh Mountain Resort and FSR 41
Medusahead	2b	Along trail adjacent to Seventh Mountain Resort

Noxious Weed	Trail Segment	Site Location
Spotted knapweed	2b	Where trail intersects with Seventh Mountain Resort trail
Spotted knapweed	2a	Along FSR 41
Spotted knapweed	2a	Along FSR 41 south of the junction with Cascade Lakes Highway

Cheatgrass infestations are common and widespread across the Forest and at this time are not a priority for treatment or inventory because most infestations occur in disturbed areas and along roadsides, and are not typically found in dense coverage in forested areas (USDA 2012).

Effects Analysis

Direct, Indirect, and Cumulative Effects

Alternative 1 – No Action

The weed sites within this project area would continue to persist and some sites would be treated with a combination of herbicide and manual removal while other sites would remain manual removal until herbicide treatments are approved. A combination of thorough herbicide treatments and manual removal would help control the weeds faster and more efficiently than solely relying on hand-pulling; however, the current level of recreation use would.

Alternative 2 and Alternative 3

Direct and Indirect Effects:

As with any ground-disturbing event, and especially where heavy machinery is involved, there is the possibility that weeds could be spread from the known knapweed site, or new ones introduced. Resource protection measures (Ch. 2.6) such as washing machinery prior to conducting work, using weed-free fill material, and treating weed sites or avoiding significant sites prior to and during implementation would reduce the chance of weeds spreading and/or being introduced.

The known weed sites have experienced disturbance for years from recreationalists and with this project and increased use, it can be expected that remaining seeds would be encouraged to germinate and grow. By inviting more public to use the area combine with the existing use and encouraging bike trail connectivity to other high concentrations of noxious weed infestations near Phil's Trailhead, the project area is susceptible to widespread infestations. However, with continued treatment of weeds authorized in previous NEPA decisions it is anticipated that the spread of weeds would be reduced.

To help alleviate the concern that weeds would enter the new seedbed that would be created with this project, disturbed areas, in particular project areas which intersect with weed sites, would be seeded with locally adapted native seed making it more difficult for weeds to establish. Implementing the resource protections measures listed in Chapter 2.6 of this EA would reduce the risk of introduction and spread of weeds.

Cumulative Effects:

Vegetation management projects (ongoing and planned such as West Bend EIS) along with existing recreation use and associated ground disturbance with the proposed trailhead and trail construction

(Table 3-2 for a list of past, present and future actions) have the potential to introduce weeds. However, resource protection measures (Ch. 2.6.1) would help with the accidental introduction of invasive species and help control weed sites that are already established. Chemical treatments would reduce weed populations but is not the ultimate solution; a combination of hand pulling, chemical treatments along with careful attention to the resource protection measures may help reduce existing populations and keep infestations at a more manageable level.

Summary

From a weed standpoint, the no action alternative provides the most protection from invasive plants being spread through or introduced into the project area, because machinery and associated vehicles would not be driving over the area, creating inviting spots for invasives to germinate and thrive. However, because of the already high recreational use in the area and its close proximity to infested private property, new populations can be expected to appear.

The two action alternatives contain risk of weed invasion, although the design features would reduce, but not eliminate, that risk. There is no discernible difference between the two action alternatives in terms of weed risk.

3.4.6 FISHERIES AND WATER

This section covers the existing conditions and effects of implementation on fisheries resources. This section incorporates by reference the Fisheries and Water Resources Resource Report contained in the project record located at the Bend-Fort Rock Ranger District. Specific information on consistency with Forest Plan, and other details are contained in the report. A summary of the existing condition and predicted effects of the alternatives are discussed in this section.

Introduction

This project proposes to build a trailhead and trails connecting the City of Bend to the Welcome Station and providing additional connections to the existing Wanoga, Phil's, and Deschutes River trail systems. Proposed activities would not take in the Upper Deschutes Wild and Scenic River corridor (MA17).

Applicable Standards and Guidelines from Management Plans

Forest Plan
RP-36 Recreation activities will be managed to prevent site deterioration within riparian areas. In areas of concentrated use, trails and dispersed and non-dispersed recreation sites will be designed, managed, and maintained to minimize impacts on riparian systems.

INFISH
RM-1: Design, construct, and operate recreation facilities, including trails and dispersed sites, in a manner that does not retard or prevent attainment of the Riparian Management Objectives and avoids adverse effects on inland native fish. For existing recreation facilities inside Riparian Habitat Conservation Areas, assure that the facilities or use of the facilities would not prevent attainment of the Riparian Management Objectives or adversely affect inland native fish. Relocate or close recreation facilities where Riparian Management Objectives cannot be met or adverse effects on inland native fish cannot be avoided.

Existing Condition

Proposed trail (Trail 2a) would cross one intermittent and one ephemeral stream channel. Neither channel has any associated riparian vegetation. The channels are 1 to 2 feet wide, and seasonally carry snowmelt waters. Neither channel connects with a perennial stream, lake, or pond, but instead stream flow percolates into the highly permeable landscape. Proposed trail construction is located entirely outside of the Upper Deschutes Wild and Scenic River corridor. Project activities would not occur in wetlands or riparian areas.

Effects Analysis

Direct, Indirect and Cumulative Effects

Alternative 1 – No Action

This alternative would have no cumulative effects to fisheries or water resources since there are no direct or indirect effects to these resources.

Alternative 2 and Alternative 3

Due to the small area impacted by proposed trail construction and the lack of riparian vegetation, activities proposed under both action alternatives would have no effect to riparian areas, intermittent or perennial stream channels, or aquatic species. The proposed project would have no effect to INFISH Riparian Management Objectives of large woody debris, water temperature, width to depth ratio, and pool frequency as the project does not impact riparian areas and has very minimal impacts to two small intermittent and ephemeral stream channels.

The project would have no effect on Executive Orders 11988 (Floodplains) and Executive Order 11990 (Wetlands) as adverse effects are avoided. There would be no effect to chinook salmon Essential Fish Habitat from this project. There would be no effect to any Oregon Department of Environmental Quality water quality impaired waterbodies (303(d) list.

The action alternatives are consistent with the standards and guidelines from the Deschutes National Forest Land and Resource Management Plan and INFISH. The action alternatives are consistent with fishery ORV of the Upper Deschutes Wild and Scenic River Management Plan. There is no direct or indirect effect to fishery ORV because project activities are not within this management area.

This project would have no cumulative effects to fisheries, water resources, or wild and scenic river fisheries outstanding remarkable values since there are no measurable direct or indirect effects to these resources from implementing Alternative 2 or Alternative 3.

Effects on Listed Fish, Fish Habitat and Sensitive Species

The project area would have no effect on listed fish species, fish habitat or Region 6 Sensitive species since proposed activities would not impact riparian areas.

This project would have no cumulative effects to fisheries or water resources since there are no measurable direct or indirect effects to these resources from implementing Alternative 2 or Alternative 3.

3.4.7 SOILS

This section covers the existing conditions and effects of implementation on soils. This section incorporates by reference the Soils Resource Memo contained in the project record located at the Bend-Fort Rock Ranger District.

Existing Condition

Soils at the trailhead and the majority of trail segments consist of volcanic ash over a buried glacial outwash or residual soils that developed over igneous rock. The site is in a low precipitation zone so productivity of vegetation is considered low to moderate, but capable of supporting stocked stands of dry ponderosa pine with some western juniper in places. Soils have high infiltration rates and low erosion potential. These soils are not considered to be sensitive and are moderately resilient in that they are not overly susceptible to compaction or other forms of detrimental disturbance such as displacement. These soils can be somewhat slow to recover from ground disturbance if organic and topsoil horizons are removed hindering their ability to retain moisture and store and cycle nutrients.

Soils at the trailhead location have experienced disturbance from past wildfires, railroad logging many decades ago, in later years roads, and past vegetation management activities. Land use at and around the trailhead has been slight in recent years, mostly related to recreational foot and bike traffic. Detrimental soil conditions near the trailhead were observed occurring on the old railroad grade that was converted to a road.

Direct, Indirect and Cumulative Effects

Alternative 1 – No Action

There are no direct or indirect effects on soil resources from the no action alternative. Direct and indirect effects do not overlap in time or space with any residual effects from past projects, ongoing projects, or from foreseeable projects; therefore there are no cumulative effects.

Alternative 2 and Alternative 3

Trailhead construction would occur on approximately 1.4 acres in Alternative 2 and 0.7 acres in Alternative 3 of land. Soils would be converted to a non-productive status and dedicated to a recreational use for the life of the trailhead. The access road into the trailhead is mainly located on existing old road surfaces.

New trail segments, both paved and mountain bike trails would also convert trails to a non-productive status for the life of the trails. Some trail segments would be rehabilitated returning soil back to a productive status. Alternative 2 would dedicate approximately 4 acres of soils to trails and Alternative 3 approximately 2.5 acres.

The total amount of soils in both Alternatives that would be converted to a non-productive status is considered low, amounting to less than $1/10^{th}$ of a percent of the project area. In this context, even the cumulative extent of the soils converted to a non-productive status by each of the action alternatives is nominal. Additionally, none of the new trail segments or trailhead would be in contact with, or connected to a water body, so their bare surfaces would not be sources of sediment.

3.4.8 HERITAGE

Introduction

Intensive archaeological surveys have been conducted over 100 percent of the APE. There were six archaeological sites that were discovered within the APE as a result of the surveys. Three of the sites are pre-contact in nature and associated with Native American resource exploitation. The remaining three sites are associated with historic railroad logging. None of the archaeological sites have been evaluated for their eligibility for listing on the National Register of Historic Places. Therefore, all of the sites will be treated as eligible until a formal determination of eligibility can be made. All six sites will be flagged for avoidance prior to commencement of the project.

For the State Historic Preservation Officer (SHPO) inventory report, a determination was made of "No Historic Properties Affected." This report was written during the summer of 2013 and was approved by the Forest Archaeologist on August 18, 2013. The report was then forwarded on to the SHPO for their information.

Effects Analysis

Direct and Indirect Effects

Alternative 1 – No Action

Under this alternative, no proposed activities would be undertaken. Therefore, no heritage resources would be affected.

Alternative 2 and Alternative 3

Known heritage sites would be avoided and/or protected; therefore, no known heritages resources would be affected by this project. Mitigation measures are in place that would be part of contract specifications should any new cultural sites be discovered during project activities.

With the design criteria included for this project, Alternative 2 and Alternative 3 is consistent with those federal laws and guidelines for the protection of NRHP eligible sites.

Cumulative Effects – All Alternatives

There are no direct or indirect effects to heritage resources from any alternatives. There would be no cumulative effects from this project.

3.4.9 TRANSPORTATION SYSTEM

The 20,273 acre project area has approximately 89.3 miles of open roads, 17.3 miles of roads closed (Maintenance Level 1) to public motorized use and 31.2 miles of roads that have been actively decommissioned.

This project proposes to make no changes to the transportation system within the project area boundary. Therefore, there will be no effects (direct, indirect, or cumulative) to transportation from any of the alternatives considered.

3.5 REQUIRED AND ADDITIONAL DISCLOSURES AND CONSISTENCY WITH LAWS, REGULATIONS, POLICY AND PROCEDURES

This section discloses the effects of the alternatives on the human environment as specified by law, regulation, policy, or executive order. This section includes a brief summary of those laws, policies, and executive orders that are relevant to the proposed actions considered in this EA.

3.5.1 THE AMERICAN ANTIQUITIES ACT OF 1906

This Act makes it illegal to appropriate, excavate, injure, or destroy any historic or prehistoric ruin or monument or any object of antiquity, situated on lands owned by the Government of the United States, without permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated.

Following guidelines in a 2004 Programmatic Agreement among USDA-Forest Service, the Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Office (SHPO), a finding of "No Historic Properties Affected" was determined under stipulation III(B)1 of the Programmatic Agreement.

In accordance with 36 CFR 800 and Section 106 of the National Historic Preservation Act (1966) all sites, despite eligibility status would be avoided. All eligible and potentially eligible (undetermined) sites would be protected throughout the life of the project. Protection of these sites shall be accomplished through avoidance by ground-disturbing activities.

Should unexpected heritage resources be encountered during project implementation, these resources would also be evaluated and significant resources would be avoided or mitigated as described above.

No impacts to any known cultural resources would result from implementation of this project.

3.5.2 TRIBAL TREATY RIGHTS

Treaties provide that Native Americans would continue to have the right to erect suitable buildings for fish curing, privileges of hunting, gathering roots and berries, and pasturing stock on unclaimed lands. All alternatives are equal in their treatment of treaty rights and are expected to maintain treaty rights and opportunities into the future.

Potentially affected Tribes, the Burns Paiute, The Klamath Tribe and the Confederated Tribes of the Warm Springs, were contacted during the scoping process. No treaty resources were identified by any Tribe as at risk. Coordination with the Tribes is going.

3.5.3 PRIME FARMLANDS, RANGE LAND, AND FOREST LAND

Actions taken under any of the alternatives would have no adverse impact on farmland, rangeland or forest land, inside of or outside the National Forest.

3.5.4 INVENTORIED ROADLESS, WILDERNESS, RESEARCH NATURAL AREA, EXPERIMENTAL FORESTS

None of these special designations occur within or adjacent to project area.

3.5.5 RESEARCH NATURAL AREAS, EXPERIMENTAL FORESTS, WILDERNESS AND FEDERAL STATE AND LOCAL LAWS

No research natural areas, experimental forests, or wilderness areas are within the project area. There are no known significant cumulative effects between the project and other projects implemented or planned on areas separated from the affected area of the project. The physical and biological effects are limited to this analysis area. No actions are proposed which are considered to be precedent setting.

There are no known effects on the human environment that are highly uncertain or involve unique or unknown risks. None of the actions threaten a violation of federal, state, or local law. Alternatives would comply with air and water quality regulations. The effects on the quality of the human environment are not likely to be highly controversial, based on public participation.

3.5.6 ENERGY REQUIREMENTS

There would be no unusual energy requirements for implementing any of the alternatives.

3.5.7 INCOMPLETE AND UNAVAILABLE INFORMATION

The Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (40 CFR 1502.22) require that a federal agency identify relevant information that may be incomplete or unavailable.

Knowledge is, and always will be, incomplete regarding many aspects of terrestrial and aquatic species and their habitats, geology of specific areas, and the economy. The alternatives were evaluated using the best available information. No missing information was deemed to be essential to a reasoned choice among alternatives being considered.

3.5.8 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible resource commitments are actions that either deplete a non-renewable resource or disturb another resource to the point that it cannot be renewed within 100 years. There are no known significant irreversible resource commitments or irretrievable loss of timber production, wildlife habitats, soil production, or water quality from actions initiated under any of the alternatives.

Loss of cultural sites resulting from accidental damage or vandalism would be an irreversible commitment of resources. Extensive cultural resource surveys and a requirement to avoid and protect cultural sites provide reasonable assurance that there would be no irreversible loss of cultural resources.

Impacts to soil are controlled by management practices and mitigation measures, and would not represent an irreversible resource commitment. The hardened and compacted surfaces of the pathway and parking site would remain in a non-forest condition for the life of the pathway and parking area.

3.5.9 SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

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

The Multiple Use-Sustained Yield Act of 1960 requires the Forest Service to manage NFS lands for multiple uses (including timber, recreation, fish and wildlife, range, and watershed). All renewable resources are to be managed in such a way that they are there for future generations. This chapter and the specialist reports prepared for this project provide the required disclosure of effects from anticipated use associated with the trails allowed under the action alternatives and under the current condition, no action, Alternative 1.

The action alternative is not expected to create any impacts that would cause irreversible damage to soil productivity. There is low risk for the proposed activities to cause soil mass failures (landslides) due to the inherent stability of dominant landtypes and the lack of seasonally wet soils on steep slopes. The development and use of the trails and a trailhead would compact surfaces and would remain in that condition for the life of the trails and trailhead use.

3.5.10 BIOLOGICAL DIVERSITY

All existing native and desirable introduced species and communities are maintained with all alternatives. For example, erosion control measures such as seeding would use native species when possible. Biological diversity would not be affected by this project.

3.5.11 REHABILITATION ACT OF 1973 - PERSONS WITH DISABILITIES

Under section 504 of the Rehabilitation Act of 1973, no person with a disability can be denied participation in a Federal program that is available to all other people solely because of his or her disability. There is no legal requirement to allow people with disabilities use of motor vehicles on

roads, trails, or other areas that are closed to motor vehicles. Restrictions on motor vehicle use that are applied consistently to everyone are not discriminatory.

3.5.12 USDA CIVIL RIGHTS POLICY

The Civil Rights Policy for the USDA, Departmental Regulation 4300-4 dated May 30, 2003, states that the following are among the civil rights strategic goals; (1) managers, supervisors, and other employees are held accountable for ensuring that USDA customers are treated fairly and equitably, with dignity and respect; and (2) equal access is assured and equal treatment is provided in the delivery of USDA programs and services for all customers. This is the standard for service to all customers regardless of race, sex, national origin, age, or disabilities.

Disparate impact, a theory of discrimination, has been applied to this projects planning process in order to reveal any such negative effects that may unfairly and inequitably impact beneficiaries regarding program development, administration, and delivery. The objectives of this review and analysis are to prevent disparate treatment and minimize discrimination against minorities, women and persons with disabilities and to ensure compliance with all civil rights statutes, Federal regulations, and USDA policies and procedures.

The project alternatives, given the size of potential social and economic effects, are not likely to result in civil rights impacts to Forest Service employees or customers of its program.

3.5.13 EXECUTIVE ORDERS

Executive Order 12898 Environmental Justice in Minority Populations and Low-income Populations (February 11, 1994)

Executive Order 12898 directs the agency to identify and address, "...as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations...." The intent of the order is to assure the fair treatment and meaningful involvement and consideration of all people. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from the execution of a federal actions. Outreach and public involvement for this project has been extensive and at various scales within various communities of interest.

In order to identify and address environmental justice concerns, the EO states that each agency shall analyze the environmental effects, including human health, economic, and social effects of Federal actions, including effects on minority populations, low-income populations, and native Americans as part of the NEPA process.

There would be no discernible impacts among the alternative in the effects on Native Americans, women, other minorities, or the Civil Rights of any American citizen.

The action alternatives does not appear to have a disproportionately high or adverse effect on minority or low-income populations. Scoping did not reveal any issues or concerns associated with the principles of Environmental Justice. No mitigation measures to offset or improve adverse effects to these populations have been identified. All interested and affected parties will continue to be involved with the public involvement and decision process.

Executive Orders 11988 Wetlands and 11990 Floodplains

Executive orders 11988 and 11990 require protection of floodplains and wetlands. The project would have no effect on Executive orders 11988 and 11990 as adverse effects are avoided.

CHAPTER 4 – CONSULTATION AND COORDINATION

4.1 PUBLIC INVOLVEMENT

The Welcome Station Trail Connections project was first published to the Deschutes and Ochoco National Forest project webpage on 1/31/2013 at: http://data.ecosystem-management.org/nepaweb/nepa_project_exp.php?project=41207

This project was first published in the Deschutes National Schedule of Proposed Actions (SOPA), a quarterly publication, in April 2013 and has appeared in each quarterly SOPA since then. This is a quarterly report that is distributed to interested individuals, organizations, and agencies Forest-wide. The SOPA is automatically updated and available on the Deschutes and Ochoco National Forest webpage at: http://www.fs.fed.us/sopa/forest-level.php?110601.

A detailed description of the proposed action was mailed on 2/6/2013, to approximately 100 forest users and concerned publics, soliciting comments and concerns related to this project. Approximately 50 letters or emails of response were received, which were considered and evaluated. Discussion of public comments can be found in the above section (Ch. 1.9 Issues) and in Chapter 2.3 Alternatives Considered but Eliminated from Detailed Study. This letter was also mailed to the Burns Paiute Tribe, The Klamath Tribe, and the Confederated Tribes of the Warm Springs. Coordination and consultation with the tribes is ongoing.

4.2 CONSULTATION WITH OTHERS

Consultation has occurred with the Oregon State Historic Preservation Office (SHPO) following guidelines in the Regional Programmatic Agreement among USDA-Forest Service, the Advisory Council on Historic Preservation, and the Oregon SHPO

The consultation with the Burns Paiute Tribe, The Klamath Tribe, and Confederated Tribes of the Warm Springs has occurred and coordination is ongoing.

4.3 INTERDISCIPLINARY PARTICIPATION

Below are the members of the interdisciplinary team responsible for coordination, conducting and contributing the environmental analysis for this project

ID Team Member	Title
Amy Tinderholt	ID Team Leader, Recreation
Alicia Underhill	ID Team Leader, NEPA Oversight, Writer/Editor
Bill Munro	Wildlife Biologist
Marlo Fisher	Botanist
Todd Reinwald	Soil Scientist
Matt Mawhirter	Cultural and Heritage Resources
Steve Bigby	Road Manager
Tom Walker	Fisheries
Robin Gyorgyfalvy	Scenery

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APPENDIX A – MANAGEMENT DIRECTION

RECREATION

FEDERAL REGULATIONS

The proposed project area for the Welcome Station Trail Connections project is within the Deschutes National Forest therefore subject to the requirements of the National Environmental Policy Act (NEPA) in compliance with the regulations as adopted by the National Forest Service (FSM 1950). The preparation of this report to be included in the Environmental Assessment is in accordance with the requirements for the environmental analysis of the project area (36 CFR 220.7).

Facilities constructed on federal lands are subjects to standards and guidelines outlined in Architectural Barriers Act (ABA) and are generally captured in the supporting FS Outdoor Recreation Accessibility Guidelines (FSORAG).

DESCHUTES NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

The following standards and guidelines related to the recreation experience and permitted activities within the project area inform how proposed management activities would be implemented and how the effects of those activities will be assessed within the project area:

Trail System Management

Goal: Maintain the existing trail system and provide additions or modifications to the system which will meet the increasing and changing demands in dispersed recreation. To the extent possible, this system will provide trails of all difficulty levels, trails in visually appealing settings, and trails for those modes of travel appropriate for the Forest in both winter and/or summer.

TR-1: The trail system will be developed to provide a variety of experiences.

TR-2 New, Reconstructed, and relocated trails will be located to take the greatest advantage of environmental features.

TR-3: Trails will be located or relocated whenever possible where they will not be disrupted by development activities such as logging or road building. Where disturbance of a trail cannot be avoided cleanup should be concurrent. Reassurance markers and signing will be maintained to avoid inconveniencing trail users.

TR-4: Trails may be constructed in any management area unless specifically excluded or constrained by the Management Area direction.

TR-7: As a general rule, the Forest will be open to all modes of travel except where specifically closed.

TR-10 Trails permitting multiple travel modes will be monitored for conflict among users. When conflicts arise all avenues of resolution will be explored. The intent is to use the minimum regulation necessary to resolve conflicts.

TR-13 Most summer trails will be open to both horses and hikers. Some trails may be closed to horses when the cost of construction/reconstruction or maintenance would be significantly increased because of horse use.

Management Areas

Deer Habitat (MA7)

Goal: To manage vegetation to provide optimum habitat conditions on deer winter and transition ranges while providing some domestic livestock forage, wood products, visual quality and recreation opportunities.

M7-1 (Recreation): The area will provide various dispersed recreation opportunities primarily for the activities of viewing wildlife, hunting, gathering forest products, and roaded camping. Rustic facilities constructed of native materials may be provided for the convenience of the user as well as for safety and resource protection.

M7-2 (Recreation): Provide the recreation setting, activity, and experience opportunities for the Recreation Opportunity Spectrum of category of Roaded Natural.

Scenic Views (MA9)

Goal: To provide Forest visitors with high quality scenery that represents the natural character of Central Oregon.

M9-1 (Recreation): New recreational developments and changes to existing developments are permitted as long as they are consistent with the desired visual condition. When viewed from significant viewer locations, recreational facilities will meet the established visual quality standards. For viewer locations within the recreational development being viewed, established visual quality standards may not be met.

M9-2 (Recreation): Parking facilities, structures and other recreational facilities will normally be placed where they are not visible from significant viewer locations. Where it is not possible to screen recreational facilities, they will be designed to blend with the elements found in the natural landscape and will remain subordinate to the overall visual strength of the surrounding landscape.

M9-3 (Recreation): The Recreation Opportunity Spectrum (ROS) standard in the Scenic Views Management Area will normally be Roaded Natural, but may also include Primitive, Semi-primitive Non-motorized, Semi-primitive Motorized and Semi-primitive Motorized Winter Only standards. The ROS classification for Scenic Views management allocations within the project area is Roaded Natural.

Intensive Recreation (MA11)

Goal: To provide a wide variety of quality outdoor recreation opportunities within a forest environment where the localized settings may be modified to accommodate large numbers of people.

M11-1 (Recreation): Provide the recreation setting, activity, and experience opportunities for the Recreation Opportunity Spectrum of category of Rural and Roaded Natural. The ROS classification for Intensive Recreation management allocations within the project area is Roaded Natural.

M11-5 (Recreation): Facility complexes will be constructed and maintained to Development Level 3 through 5. Complementary developments at levels 1 and 2 can be provided in minor numbers and in proportion of capacity if essential to best utilize the recreation experience available within the area.

M11-15 (Trails): New trails constructed within this Management Area will emphasize walking, bicycle riding and hiking opportunities. Horse trails will generally not be constructed in heavily used areas.

Table 1: Actions by management allocation, trail designed use and alternative.

LRMP Management Allocations	Miles of Trail within Management Allocations	
	Alternative 2	**Alternative 3**
MA7 Deer Habitat	6.9	6.9
MA9 Scenic Views	5.3	3.6
MA11 Intensive Recreation	5	1.9
Other Ownership	0.9	0.9
TOTAL	**18.1**	**13.3**

UPPER DESCHUTES WILD AND SCENIC RIVER MANAGEMENT PLAN (UDWSR)

Recreation is identified as an Outstandingly Remarkable Value in the UDWSR Plan for Segment 4 due to the range of activities, the variety of interpretive opportunities, and the attraction of the river for vacationers from outside of the region.

UDWSR Recreation Standard: A variety of recreational values will be provided within a predominantly natural setting without adversely affecting other river values.

The following recreational guidelines are applicable to the project:

R-1: Total use will be managed according to designed annual capacities...which will serve as a basis for site designation and development. The Recreational Opportunity Spectrum Standards and resource protection needs will determine the total number, location and development levels of recreation sites.

> The designed annual capacity for Segment 4 as a whole is listed under the Upper Deschutes Wild and Scenic River Record of Decision as 44,000 annual non-commercial use days[5] accessed by a total of 116 developed sites[6]. This accommodates an anticipated increase in use of 11,000 annual visits from the 33,000 use days identified as the existing condition in 1996.

R-10: Bicycles will be permitted on trails unless otherwise designated; no off-road/off-trail use will be allowed on public lands within the river corridor.

R-12: Use of the existing Deschutes River Trail by both hikers and bikers will be allowed until resource conditions or user conflicts are determined to be unacceptable.

[5] Use numbers are based on recreation site and trail capacities. Trail or river users who cross segments boundaries are counted in each segment.
[6] Includes individual campsites and individual parking spaces at boat ramps and trailheads.

Probable Actions: actions, which, at the time the Plan was prepared, would most likely be needed to achieve the goals or Standards and Guidelines of the Plan. Probable actions for recreation in the project area include the construction of a surfaced, primary bike trail from the Bend Urban Growth Boundary to Sunriver.

CASCADE LAKES SCENIC BYWAY CORRIDOR MANAGEMENT PLAN

In 1998, the Cascade Lakes Highway was designated a National Scenic Byway because of its outstanding scenic, natural, and recreational qualities, regional significance to visitors, and enhancement of livability for central Oregon residents accessing public lands through the Byway. The Cascade Lakes Scenic Byway Corridor Management Plan, originally developed in 1996 and updated in 2011, was designed to protect and preserve the Byways intrinsic scenic, natural, and recreational qualities for future generations by enhancing and maintaining its image, identity, and integrity through collaborative partnerships and community connections. Based upon community input, the Plan identifies enhancement and development priorities for the corridor. The Welcome Station was identified as the first priority and development of a trailhead and interpretive site near the Forest boundary with Bend to provide parking for forest users and tell the story of the 1990 Awbrey Hall fire is the second priority. The Plan also identifies one strategy to accomplish the goal of preserving the Byway as a major attraction in the Pacific Northwest is to create hubs for trail connectivity and multi-modal transit opportunities.

RECREATION OPPORTUNITY SPECTRUM (ROS)

The Recreation Opportunity Spectrum (ROS) is both a classification system and a prescriptive tool for recreation planning, management, and research. It is used within the Forest Plan to describe the recreational setting by describing a combination of the physical, biological, social, and managerial conditions that give value to a place (Clark and Stankey, 1979). The proposed actions in alternatives 2 and 3 are within a Roaded Natural classification.

Roaded Natural: Area is characterized by predominately natural appearing environment with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Resource modification and utilization practices are evident, but harmonize with the natural environment.

Applicable Policy and Guidelines

Forest Service Trails Accessibility Guidelines (FSTAG) apply to trails in the National Forest System that (1) are new or altered; (2) have a designed use of hiker/pedestrian under the Forest Service Trail Planning and Management Fundamentals and Interagency Trail Data Standards (ITDS); and (3) connect directly to a currently accessible trail or to a trailhead. Where provided, associated constructed features (such as tent pads and fire rings) located along National Forest System trails shall comply with the Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG), as provided in Forest Service Manual (FSM) 2330.03, paragraph 4(f).

FS Outdoor Recreation Accessibility Guidelines FSORAG, in part, requires site designs to incorporate Outdoor Recreation Access Routes (ORAR) to constructed facilities when the development scale is 3 or higher.

Built Environment Image Guide (*BEIG*) outlines how the built environment should reflect the context of its surroundings, including its physical setting, social context, and long-term economic effects.

BEIG tiers to the use of the ROS to select the location, type, and scale of facilities and building materials.

Forest Service Manual FSM 2333.03 establishes priorities for the development and management of recreation sites in the following order: 1. Ensure public health and safety; 2. Protect the natural environment of the site; 3. Manage and maintain sites and facilities to enhance users' interaction with the natural resource; 4. Provide new developments that conform to the National Forest recreation role. FSM also defers to ROS for standards, describes site plan content requirements and directs managers to carefully consider future operation and maintenance costs when designing new facilities.

Forest Service Handbook 2309.18, Chapter 20 outlines trail development standards, class specifications and the following objectives:

a. Provide trails that meet their Trail Management Objectives (TMOs), are consistent with the applicable land management plan, provide opportunities for satisfying recreation experiences, harmonize with and provide opportunities for enjoyment of the national forest or grassland setting, and minimize maintenance costs.
b. Design, construct, and maintain sustainable trails, that is, trails that withstand the wear and tear of normal traffic and reasonable user behavior during the managed season of use and that have minimal negative effects on adjacent resources.

Clauses with Forest Service Special Use Permits:

a. The holder has an affirmative duty to protect from damage the land, property, and other interests of the United States. Damage includes but is not limited to fire suppression costs, damage to government-owned improvements covered by this permit….
b. If the environment or any government property covered by this permit becomes damaged during the holder's use or occupancy of the permit area, the holder shall immediately repair the damage or replace the damaged items to the satisfaction of the authorized officer and at no expense to the United States.
c. The holder shall be liable for damage caused by use of the holder or the holder's heirs, assigns, agents, employees, contractors, or lessees to all roads and trails of the United States to the same extent as provided under clause IV.F.1, except that liability shall not include reasonable and ordinary wear and tear

FISHERIES AND AQUATIC RESOURCES

MANAGEMENT DIRECTION

The project area is within the boundaries of the Northwest Forest Plan (i.e. east of the owl line), and lies within the management area of the Inland Native Fish Strategy (INFISH), which amended the 1990 Deschutes National Forest Land and Resource Management Plan (Forest Plan) in 1995. All project activities are outside the Northwest Forest Plan boundaries. The project area also includes land within the corridor of the Upper Deschutes Wild and Scenic River (UDWSR), for which an Environmental Impact Statement (EIS) and Comprehensive Management Plan (River Plan) were completed in 1996 (Segment 4). The Forest Plan was amended and assigned Management Area 17a to the Upper Deschutes Wild and Scenic River. Trail construction proposed under this project (Alternative 2 and Alternative 3) would take place outside the Wild and Scenic river corridor.

Management direction within INFISH requires Riparian Habitat Conservation Areas (RHCA's) to be delineated for watersheds. They are portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. The project activities would cross one intermittent stream channel, which is designated as a Category 4 RHCA in INFISH. The width of this RHCA is 50 feet slope distance from the edge of the stream channel on both sides. There are no RHCA width designations for ephemeral streams in INFISH.

Applicable Standards and Guidelines from All Management Plans

Deschutes Land and Resource Management Plan

RP-36 Recreation activities will be managed to prevent site deterioration within riparian areas. In areas of concentrated use, trails and dispersed and non-dispersed recreation sites will be designed, managed, and maintained to minimize impacts on riparian systems.

Inland Native Fish Strategy

RM-1: Design, construct, and operate recreation facilities, including trails and dispersed sites, in a manner that does not retard or prevent attainment of the Riparian Management Objectives and avoids adverse effects on inland native fish. For existing recreation facilities inside Riparian Habitat Conservation Areas, assure that the facilities or use of the facilities would not prevent attainment of the Riparian Management Objectives or adversely affect inland native fish. Relocate or close recreation facilities where Riparian Management Objectives cannot be met or adverse effects on inland native fish cannot be avoided.

BOTANY

DESCHUTES NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

The Welcome Station Trail Connections project as regards to TES plant species is consistent with the Deschutes LRMP (1990). Records were checked for previously known TES plant populations (TE-1); and suitable habitat was not located (TE-2).

A biological evaluation to document consideration of Threatened, Endangered, and Sensitive (TES) plant species was prepared in compliance with FSM 2672.4 and the Endangered Species Act of 1973 (Subpart B; 402.12, section 7 consultation). Project effects are evaluated for those TES plant species on the current Regional Forester's Sensitive Species List (FSM 2670.44, December 2011) that are documented or suspected to occur on the Deschutes National Forest.

INVASIVE SPECIES

FOREST SERVICE MANUAL 2080 NOXIOUS WEED MANAGEMENT

Forest Service Manual (FSM) direction requires that Noxious Weed Risk Assessments be prepared for all projects involving ground-disturbing activities. For projects that have a moderate to high risk of introducing or spreading noxious weeds, Forest Service policy requires that decision documents must identify noxious weed control measures that will be undertaken during project implementation (FSM 2081.03).

Aggressive non-native plants, or noxious weeds, can invade and displace native plant communities causing long-lasting management problems. Noxious weeds can displace native vegetation, increase

fire hazards, reduce the quality of recreational experiences, poison livestock, and replace wildlife forage. By simplifying complex plant communities, weeds reduce biological diversity and threaten rare habitats. Potential and known weeds for the Deschutes National Forest are listed in Appendix A.

In addition to noxious weeds, which are designated by the State, there is a group of non-native plants that are also aggressive though are not officially termed "noxious". These species are also considered in this assessment.

DESCHUTES NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

There are no Standards and Guidelines included in the original 1990 Deschutes National Forest Land and Resource Management Plan (LRMP) addressing the weed issue. However, in 2005 a Record of Decision for Preventing and Managing Invasive Plants was signed and was thereby incorporated into the Deschutes LRMP. See discussion below under “Prevention Strategy”.

The Welcome Station Trail Connections project meets the Forest Service Manual direction stating that for any project with a moderate to high risk of weed invasion, control measures must be in place. This project has a high risk, and control measures are in place that address that concern (EA Ch. 2.6.1 Resource Protection Measures).

PREVENTION STRATEGY

A Record of Decision for Preventing and Managing Invasive Plants was signed in October 2005, and incorporates its standards into the Forest Plan of the Deschutes National Forest. Three of those standards specifically address prevention of weed introductions (# 1, 2, and 7; below) into projects of the type that the Welcome Station Trail Connections represents. These standards obligate the Forest Service to incorporate weed prevention into its planning documents and implementation phase, and include the inspection of fill material (EA Ch. 2.6.1 Resource Protection Measures).

REGION 6 RECORD OF DECISION PREVENTING AND MANAGING INVASIVE PLANTS (OCT. 2005)

Applicable Standards

Standard #1

Prevention of invasive plant introduction, establishment and spread will be addressed in watershed analysis; roads analysis; fire and fuels management plans, Burned Area Emergency Recovery Plans; emergency wildland fire situation analysis; wildland fire implementation plans; grazing allotment management plans, recreation management plans, vegetation management plans, and other land management assessments.

Standard #2

Actions conducted or authorized by written permit by the Forest Service that will operate outside the limits of the road prism (including public works and service contracts), require the cleaning of all heavy equipment (bulldozers, skidders, graders, backhoes, dump trucks, etc.) prior to entering National Forest System Lands. This standard does not apply to initial attack of wildland fires, and other emergency situations where cleaning would delay response time.

Standard #7

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.

SOILS

DESCHUTES NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

The Deschutes National Forest's Land and Resource Management Plan (LRMP, USDA 1990) provides direction for managing natural resources and land uses on the forest. It defines standards and guidelines for maintaining or enhancing long-term soil productivity, minimizing the extent of detrimental soil impacts, limiting mechanical treatments on sensitive soil types, minimizing erosion and mass wasting, and measures for rehabilitation of detrimental soil conditions.

The primary objective of this direction is to ensure that management activities are planned and conducted so that onsite loss of soil productivity is minimized on lands which are not officially dedicated to permanent facilities. Soil quality standards and guidelines do not apply however to intensively developed sites, such as mining sites, recreation facilities, and administrative sites. These are considered to be accepted trade-offs where soils are dedicated to a land use that may convert or maintain them in a non-forest condition. There is no direction in the LRMP that standardizes the development, management, and use of recreational use relative to soil resources.

GENERAL WATER QUALITY BEST MANAGEMENT PRACTICES

Although there are no standards and guidelines relative to soils and dedicated recreational use, appropriate Best Management Practices (BMPs) are typically applied to all ground-disturbing activities, as described in General Water Quality Best Management Practices (USDA, 2012).

SCENERY

DESCHUTES NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

The Deschutes National Forest Land and Resource Management Plan provides standards and guidelines for an array of land uses referred to as Management Areas. The Scenic Views and Wild and Scenic River Management Areas are described in terms of desired future conditions for various settings and how these are to be met by specified activities or actions.

MA 9 – Scenic Views Management Area

Goal, General Theme and Objectives

The goal is to provide high quality scenery representing the natural character of Central Oregon. The general theme and objectives of Scenic Views is for landscapes seen from selected travel routes and use areas to be managed to maintain or enhance the appearance of the areas being viewed. To the casual observer, results of activities will either not be evident or will be visually subordinate to the natural landscape. Landscapes will be enhanced by opening views to distant peaks, unique rock forms, unusual vegetation, or other features of interest. Landscapes containing negative visual elements, such as skid roads, activity residue, or cable corridors, will be rehabilitated.

Standards and Guides – Recreation

M9-1 New recreational developments and changes to existing developments are permitted as long as they are consistent with the desired visual condition. When viewed from significant viewer locations, recreational facilities will meet the established visual quality standards. For viewer locations within the recreational development being viewed, established visual quality standards may not always be met.

M9-2 Parking facilities, structures and other recreational facilities will normally be placed where they are not visible from significant viewer locations. Where it is not possible to screen recreational facilities, they will be designed to blend with the elements found in the natural landscape and will remain subordinate to the overall visual strength of the surrounding landscape.

M9-3 The Recreation Opportunity Spectrum (ROS) of Roaded Natural, but may also include Primitive, Semi-Primitive Non-Motorized, Semi-Primitive Motorized and Semi-Primitive Motorized Winter Only standards.

MA 17 – Wild and Scenic Rivers Management Area

Goal, General Theme and Objectives

The goal is to protect and enhance those Outstandingly Remarkable Values that qualified segments of the Deschutes for inclusion in the National Wild and Scenic Rivers system. The general theme and objectives are to also maintain the free-flowing nature of the river and to provide recreation settings close to Bend that feature a relatively natural environment emphasizing day use and minimal development.

M17-11 This Scenic River Segment is High Scenic Integrity (SMS) or Retention (VMS) and for the Recreation River Segment is Moderate Scenic Integrity (SMS) or Partial Retention (VMS).

UPPER DESCHUTES WILD AND SCENIC RIVER COMPREHENSIVE MANAGEMENT PLAN

Upper Deschutes Wild and Scenic River and State Scenic Waterway Comprehensive Management Plan provides protection and enhancement of the Outstandingly Remarkable Values for which the Upper Deschutes River was designated into the Wild and Scenic Rivers System. The project area is within the Upper Deschutes Wild and Scenic River and has Outstandingly Remarkable Values for Scenery and Recreation. With the exception of developed sites, segments with Scenic River classification will be managed to meet a High Scenic Integrity Level (Scenery Management System) or Retention (Visual Management System).

Segments within Recreation River classification will be managed to provide interpretive programs that improve public awareness and understanding of Outstandingly Remarkable Values. Wildlife interpretation for this area will focus on habitat protection, species that wildlife viewers will have a high likelihood of seeing, and educating the public in the importance of wetlands, meadows, snags, and other unique habitats.

The mix of geologic, hydrologic, vegetative, and wildlife resources found along portions of Segments 2 and 4 of the Upper Deschutes River make scenery an Outstandingly Remarkable Value. Although the level and proximity of private development intrudes on the scenic quality of Segment 3, the scenic value is still a significant element of the recreational value.

Criteria for the Outstandingly Remarkable Value of Scenic is that landscape elements of landform, vegetation, water, color and related factors result in notable or exemplary visual features and/or attractions. When analyzing scenic values, additional factors such as seasonal variations in vegetation,

scale of cultural modifications, and length of time negative intrusions are viewed may be considered. Scenery and visual attractions may be highly diverse over the majority of the river or river segment.

The standard for Scenery is that the scenic integrity will be protected and enhanced by blending natural and cultural elements of the landscape to be consistent with the expected physical and social setting of the designated Recreational Opportunity Spectrum (ROS). Visitors typically expect to see more signs of human activities in Rural and Urban ROS classifications and less in Roaded Natural.

Mostly because of the scenic value of the area's unique geological and hydrological features, the Scenic Views – Foreground Management Area is classified as High Scenic Integrity (Retention - VMS) with the distance from 0 to 300 feet for Immediate Foreground and 300 feet to ¼ mile for Foreground.

SCENERY MANAGEMENT SYSTEM OBJECTIVES

The project area is located within a Scenic Views Management Area that has a High Scenic Integrity Level in the newer Scenery Management System (SMS) and Retention – Foreground in the older Visual Management System (VMS). The currently used SMS retains many of the basic inventory elements of VMS and was improved in order to integrate both the visitor experience and people's values into the analysis process as a way to balance both human and natural needs in managing ecosystems.

The USDA Forest Service developed Landscape Aesthetics - A Handbook for Scenery Management System (1995) used to protect and enhance scenic resources which may be diminished by human activities, such as vegetation management, recreation and/or administrative facility development. The analysis takes into consideration the balance between Social (human) and Ecological (natural) needs within the analysis area.

The Forest Service implementing regulations currently establish a variety of Scenic Integrity Levels for Scenic Views—MA9 (LRMP page 4-121). These standards include:

- High Scenic Integrity Level – SMS - Natural Appearing Landscape (Retention - VMS) – MA 9, SV-1 Foreground, SV-3 Middleground
- Moderate Scenic Integrity Level – SMS - Slightly Altered Landscape (Partial Retention - VMS) – MA 9, SV-2 Foreground, SV-4 Middleground
- Low Scenic Integrity Level – SMS - Altered Landscape (Modification – VMS or General Forest) – MA 8, GFO with Foreground as well as Middleground.

The distance zones for Scenic Views Management Areas for an observer are as follows:

- Immediate Foreground 0 to 300 feet
- Foreground 0 to ½ mile
- Middleground ½ to 4 miles
- Background 4 miles to horizon

Scenery Management System Objectives are defined in terms of Scenic Integrity Levels which describe existing conditions and whether the landscape is visually perceived to be "complete" or not. The most complete or highest rating for Scenic Integrity Levels means having little or no deviation from the landscape character that makes it appealing and attractive to visitors and local residents. In addition to describing existing conditions, Scenic Integrity Levels also describe the level of development allowed and ways to mitigate deviations from the area's landscape character.

Usually the most effective way to meet Scenic Integrity Levels is to repeat visual form, line, color, texture, pattern, and scale common to the scenic values of the landscape character being viewed. For example, in natural and natural appearing landscapes, deviations such as created openings can sometimes be visually enhanced through repetition of size, shape, spacing, surface color, edge effect, and pattern of natural openings common to the existing landscape character.

Adding structures or additions to existing structures in the landscape can often be accomplished by repeating architectural form, line, color, texture, pattern, and scale that visually relates to the surrounding site features. When repetition is designed to be accurate and well placed, the deviation may blend so well that change is not evident. Refer to LRMP, MA9, Scenic Views Allocation; and the Scenery Management System Handbook (SMS--USDA FS 1995) for more detail.

WILDLIFE

All project actions are in compliance with the Endangered Species Act (ESA) of 1973 (16 U.S.C.1531 et seq.) as amended, the National Forest Management Act (NFMA) of 1976 (including FS Manual 2670 direction for threatened, endangered, and sensitive species management), and the Deschutes National Forest Land and Resource Management Plan (LRMP) [1990]. The proposed recreation project is applicable to the Environmental Assessment for the Continuation of Interim Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales (referenced as the "Eastside Screens"; USDA, 1995) however, no timber resources would be sold for this project.

Additionally, projects proposed on the Deschutes National Forest in occupied or potential habitat of any federally listed species must be consistent with the Project Design Criteria (PDC) for the Joint Aquatic and Terrestrial Programmatic Biological Assessment for Fiscal Years 2006-2009 (USDA et al. 2006), hereafter referred to as the Programmatic BA. If PDCs are consistent with the Programmatic BA, no further consultation is required.

DESCHUTES NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

The Welcome Station Trail Connections project is consistent with the Forest Plan as amended.

The project area is also within the Ryan Ranch Key Elk Area, as designated in the Forest Plan (LRMP 4-56 to 4-58; Appendix 16-2). Elk are found in certain key habitat areas, within which land management is designed to provide conditions needed to support summering and wintering elk.

APPENDIX B – RECREATION

RECREATION OPPORTUNITY SPECTRUM

ACCESS					
Access includes type and mode of travel. Highly developed access generally reduces the opportunities for solitude, risk, and challenge. However, it can enhance opportunities for socializing, and feelings of safety and comfort.					
	Cross-Country Travel	Non-Motorized Trails	Motorized Trails and Primitive Roads (Traffic Ser D)	Controlled (2) TSL B&C Rds.	Full Access
Primitive	Norm	Norm	Unacceptable	Unacceptable	Unacceptable
Semi-Primitive Non-Motorized	Compatible	Norm	Inconsistent	Unacceptable	Unacceptable
Semi-Primitive Motorized	Compatible	Compatible	Norm	Inconsistent	Unacceptable
Roaded Natural	**Compatible**	**Compatible**	**Compatible**	**Norm**	**Norm**
Rural	Compatible	Compatible	Compatible	Compatible	Norm
Urban	Compatible	Compatible	Compatible	Compatible	Norm
(1) Roaded Natural may be prescribed in certain circumstances with roads partially or fully closed. (2) TSL = Traffic Service Level. In TSL-D primitive roads should provide challenge to 4-wheel drive and high clearance vehicles but discourage use by highway vehicles. By definition, they are "Single-use controlled traffic roads. The surface is rough. Stable during dry weather. Rutting is controlled for protection of water only".					

REMOTENESS					
Remoteness refers to the extent to which individuals perceive themselves removed from the sights and sounds of human activity. A lack of remoteness is important for some setting experiences.					
	Out of sight and sound of human activity. More than 1 and 1/2 hr. walk. (1)	Distant sight and/or sound of human activity. More than 1/2 hr. walk from any motorized travel.	Distant sight and/or sound of human activity. More than 1/2 hr. walk from any better-than-primitive roads.	Remoteness of little relevance/ no distance requirements.	Remoteness of little relevance/ no distance requirements.
Primitive	Norm	Inconsistent	Unacceptable	Unacceptable	Unacceptable
Semi-Primitive Non-Motorized	Compatible	Norm	Inconsistent	Unacceptable	Unacceptable

Semi-Primitive Motorized	Compatible	Compatible	Norm	Inconsistent	Unacceptable
Roaded Natural	**Compatible**	**Compatible**	**Compatible**	**Norm**	**Norm**
Rural	Compatible	Compatible	Compatible	Compatible	Norm
Urban	Compatible	Compatible	Compatible	Compatible	Norm
(1) Excepting for legislative direction, for example the Wilderness Act, may require primitive management on lands less remote than this.					

NATURALNESS

This refers to the degree of naturalness of the setting; it affects psychological outcomes associated with enjoying nature This indicator is portrayed by using a compatible visual quality objective (VQO) for each setting, as shown in the matrix on the next page. The USDA landscape Management Handbook series can provide further guidance

	Preservation	Retention	Partial Retention	Modification	Maximum Modification
Primitive	Norm	Inconsistent	Unacceptable	Unacceptable	Unacceptable
Semi-Primitive Non-Motorized	Compatible	Norm	Inconsistent	Unacceptable	Unacceptable
Semi-Primitive Motorized	Compatible	Compatible	Norm	Inconsistent	Unacceptable
Roaded Natural	**Compatible**	**Compatible**	**Compatible**	**Norm**	**Norm**
Rural	Compatible	Compatible	Compatible	Compatible	Norm
Urban	Compatible	Compatible	Compatible	Compatible	Norm

FACILITIES AND SITE MANAGEMENT

This indicator refers to the level of site development. A lack of facilities and site modifications can enhance feelings of self-reliance and independence, and can provide experiences with a high degree of naturalness. Highly developed facilities can add feelings of comfort and convenience, and increase opportunities for socializing.

	No facilities for user comfort. Rustic and rudimentary ones for site protection only. Use undimensioned native materials only.	Rustic and rudimentary facilities primarily for site protection. No evidence of synthetic materials. Use undimensioned native materials.	Rustic facilities providing some comfort for the user as well as site protection. Use native materials with refinement in design. Synthetic materials not evident.	Some facilities designed primarily for user comfort and convenience. Synthetic but harmonious materials are incorporated. Design may be more complex and refined.	Facilities mostly designed for user comfort and convenience. Synthetic materials commonly used. Facility design may be highly complex and refined but in harmony or

					complimentary to the site.
Primitive	Norm	Inconsistent	Unacceptable	Unacceptable	Unacceptable
Semi-Primitive Non-Motorized	Compatible	Norm	Inconsistent	Unacceptable	Unacceptable
Semi-Primitive Motorized	Compatible	Compatible	Inconsistent	Unacceptable	Unacceptable
Roaded Natural	**Compatible**	**Compatible**	**Compatible**	**Inconsistent**	**Unacceptable**
Rural	Compatible	Compatible	Compatible	Norm	Inconsistent
Urban	Compatible	Compatible	Compatible	Compatible	Norm

SOCIAL ENCOUNTERS

This factor refers to the number and type of other recreationists met along travelways, or camped within sight or sound of others. This setting indicator measures the extent to which an area provides experiences such as solitude, or the opportunity for social interaction. Increasing the number of visitors to an area changes the kind of recreation experience offered, attracting new users and causing others to leave.

	6 parties or less met per day. Less than 3 visible parties campsite.(1)	6-15 parties met per day. 6 or less parties seen at campsite.	Moderate to high contact on roads. Moderate to low on trails and developed sites.	Moderate to high contact in developed sites on roads and trails.	Large numbers of users on site and in nearby areas. High number of social encounters.
Primitive	Norm	Inconsistent	Unacceptable	Unacceptable	Unacceptable
Semi-Primitive Non-Motorized	Compatible	Norm	Inconsistent	Unacceptable	Unacceptable
Semi-Primitive Motorized	Compatible	Norm	Inconsistent	Unacceptable	Unacceptable
Roaded Natural	**Compatible**	**Compatible**	**Norm**	**Inconsistent**	**Unacceptable**
Rural	Compatible	Compatible	Compatible	Norm	Inconsistent
Urban	Compatible	Compatible	Compatible	Compatible	Norm

(1) See regional supplements for party size limitations.

VISITOR IMPACTS

This factor refers to the impacts of visitor use on the environment. The relevant question for managers is not "how can impacts be prevented", but rather, "how much change will be allowed and which actions are appropriate for control". The matrix below suggests appropriate actions for controlling impacts on soil and vegetation. Impacts on wildlife habitat, and on air, water, and sound quality affect the visitor's experience as well Visitor impacts can alter wildlife habitat or displace wildlife species, including indicator species, which provide an important means of monitoring recreation related impacts on fish and other wildlife Maintaining air, water, and noise quality standards in the face of visitor impacts is important in all ROS classes.

	Unnoticable impacts. No site hardening.	Subordinate impacts. No site hardening.	Subordinate impacts. Limited site hardening.	Subtle site hardening.	Subtle site hardening. Site hardening may be dominant but in harmony.
Primitive	Norm	Inconsistent	Unacceptable	Unacceptable	Unacceptable
Semi-Primitive Non-Motorized	Compatible	Norm	Inconsistent	Unacceptable	Unacceptable
Semi-Primitive Motorized	Compatible	Compatible	Norm	Inconsistent	Unacceptable
Roaded Natural	**Compatible**	**Compatible**	**Compatible**	**Norm**	**Inconsistent**
Rural	Compatible	Compatible	Compatible	Compatible	Norm
Urban	Compatible	Compatible	Compatible	Compatible	Compatible

VISITOR MANAGEMENT

This includes the degree to which visitors are regulated and controlled as well as the level of information and services provided for visitor enjoyment. In some opportunity settings, controls are expected and appropriate. For instance, people sometimes seek developed settings for security and safety. Elsewhere, on-site controls may detract from desired experiences, such as independence, self-reliance, and risk-taking.

The type and level of information, and where it is provided to the visitor, may facilitate or hinder a desired experience. On-site interpretive and directional signing may adversely affect the visitor where experiences such as self-discovery, challenge, and risk are important. In other situations, on-site information may be essential to achieve desired experiences. Generally, on-site information is more appropriate at the developed end of the spectrum, while off-site sources are preferable at the primitive end.

	Low regimentation. No on-site controls or information facilities.	Subtle on-site regimentation and controls. Very limited information facilities.	On-site regimentation and controls are noticeable but harmonize with the natural	Regimentation and controls obvious and numerous but harmonize. More complex information	Regimentation and controls obvious and numerous. Sophisticated information exhibits.

			environment. Simple information facilities.	facilities.	
Primitive	Norm	Inconsistent	Unacceptable	Unacceptable	Unacceptable
Semi-Primitive Non-Motorized	Compatible	Norm	Inconsistent	Unacceptable	Unacceptable
Semi-Primitive Motorized	Compatible	Norm	Inconsistent	Unacceptable	Unacceptable
Roaded Natural	**Compatible**	**Compatible**	**Norm**	**Inconsistent**	**Unacceptable**
Rural	Compatible	Compatible	Compatible	Norm	Inconsistent
Urban	Compatible	Compatible	Compatible	Compatible	Norm
* See regional supplements for party size limitations.					

TRAIL CLASS MATRIX

Trail Classes are general categories reflecting trail development scale, arranged along a continuum. The Trail Class identified for a National Forest System (NFS) trail prescribes its development scale, representing its intended design and management standards.1 Local deviations from any Trail Class descriptor may be established based on trail-specific conditions, topography, or other factors, provided that the deviations do not undermine the general intent of the applicable Trail Class.

Identify the appropriate Trail Class for each National Forest System trail or trail segment based on the management intent in the applicable land management plan, travel management direction, trail-specific decisions, and other related direction. Apply the Trail Class that most closely matches the management intent for the trail or trail segment, which may or may not reflect the current condition of the trail.

Trail Attributes	**Trail Class 1 Minimally Developed**	**Trail Class 2 Moderately Developed**	**Trail Class 3 Developed**	**Trail Class 4 Highly Developed**	**Trail Class 5 Fully Developed**
Tread & Traffic Flow	· Tread intermittent and often indistinct · May require route finding · Single lane with no allowances constructed for passing · Predominantly native materials	· Tread continuous and discernible, but narrow and rough · Single lane with minor allowances constructed for passing · Typically native materials	· Tread continuous and obvious · Single lane, with allowances constructed for passing where required by traffic volumes in areas with no reasonable passing opportunities available · Native or imported materials	· Tread wide and relatively smooth with few irregularities · Single lane, with allowances constructed for passing where required by traffic volumes in areas with no reasonable passing opportunities available · Double lane where traffic volumes are high and passing is frequent · Native or imported materials · May be hardened	· Tread wide, firm, stable, and generally uniform · Single lane, with frequent turnouts where traffic volumes are low to moderate · Double lane where traffic volumes are moderate to high · Commonly hardened with asphalt or other imported material
Obstacles	· Obstacles common, naturally occurring, often substantial and intended to provide increased challenge · Narrow passages; brush, steep grades, rocks and logs present	· Obstacles may be common, substantial, and intended to provide increased challenge · Blockages cleared to define route and protect resources · Vegetation may encroach into trailway	· Obstacles may be common, but not substantial or intended to provide challenge · Vegetation cleared outside of trailway	· Obstacles infrequent and insubstantial · Vegetation cleared outside of trailway	· Obstacles not present · Grades typically < 8%

Trail Attributes	Trail Class 1 Minimally Developed	Trail Class 2 Moderately Developed	Trail Class 3 Developed	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Constructed Features & Trail Elements	· Structures minimal to non- existent · Drainage typically accomplished without structures · Natural fords · Typically no bridges	· Structures of limited size, scale, and quantity; typically constructed of native materials · Structures adequate to · protect trail infrastructure and resources · Š Natural fords · Š Bridges as needed for resource protection and appropriate access	· Structures may be common and substantial; constructed of imported or native materials · Natural or constructed fords · Bridges as needed for resource protection and appropriate access	· Structures frequent and substantial; typically constructed of imported materials · Constructed or natural fords · Bridges as needed for resource protection and user convenience · Trailside amenities may be present	· Structures frequent or continuous; typically constructed of imported materials · May include bridges, boardwalks, curbs, handrails, trailside amenities, and · similar features
Signs 2	· Route identification signing limited to junctions · Route markers present when trail location is not evident · Regulator y and resource protection signing infrequent · Designation signing, unless required, generally not present · Information and interpretive signing generally not present	· Route identification signing limited to junctions · Route markers present when trail location is not evident · Regulator y and resource protection signing infrequent · Destination signing typically infrequent outside of wilderness; generally not present in wilderness · Information and interpretive signing not common	· Route identification signing at junctions and as needed for user reassurance · Route markers as needed for user reassurance · Regulator y and resource protection signing may be common · Destination signing likely outside of wilderness; generally not present in wilderness · Information and interpretive signs may be present outside of wilderness	· Route identification signing at junctions and as needed for user reassurance · Route markers as needed for user reassurance · Regulator y and resource protection signing common · Destination signing common outside of wilderness; generally not present in wilderness · Information and interpretive signs may be common outside of wilderness · Accessibility information likely displayed at trailhead	· Route identification signing at junctions and for user reassurance · Route markers as needed for user reassurance · Regulator y and resource protection signing common · Destination signing common · Information and interpretive signs common · Accessibility information likely displayed at trailhead

Typical Recreation Environs & Experience 3	· Natural, unmodified · ROS: Typically Primitive to · Roaded Natural · WROS: Typically Primitive to · Semi-Primitive	· Natural, essentially unmodified · ROS: Typically Primitive to · Roaded Natural Typically · WROS: Typically Primitive to Semi-Primitive	· Natural, primarily unmodified · ROS: Typically Primitive to Roaded Natural · WROS: Typically Semi-Primitive to Transition	· May be modified · ROS: Typically Semi-Primitive to Rural Roaded Natural to Rural setting · WROS: Typically Portal or · Transition	· May be highly modified · Commonly associated with visitor centers or high-use recreation sites · ROS: Typically Roaded · Natural to Urban · Generally not present in · Wilderness

[1] For National Quality Standards for Trails, Potential Appropriateness of Trail Classes for Managed Uses, Design Parameters, and other related guidance, refer to FSM 2353, FSH 2309.18, and other applicable agency references.

[2] For standards and guidelines for the use of signs and posters along trails, refer to the Sign and Poster Guidelines for the Forest Service (EM-7100-15).

[3] The Trail Class Matrix shows the combinations of Trail Class and Recreation Opportunity Spectrum (ROS) or Wilderness Recreation Opportunity Spectrum (WROS) settings that commonly occur, although trails in all Trail Classes may and do occur in all settings. For guidance on the application of the ROS and WROS, refer to FSM 2310 and 2353 and FSH 2309.18.

APPENDIX C – PUBLIC COMMENTS

INTRODUCTION

A 30-day comment period for the Welcome Station Trail Connections project was provided for interested and affected publics. Letters requesting comments were sent to the Welcome Station Trail Connections project mailing list on November 20, 2013. The mail list included federal, state, and local agencies, Confederated Tribes of the Warm Springs, Burns Paiute Tribe, The Klamath Tribes, various environmental organizations, and interested individuals.

A legal notice in The Bulletin (the newspaper of record) requesting comments was published on November 22, 2013 initiating the 30-day comment period. Comments were accepted until December 23, 2013. During the comment period, the Forest received approximately eleven comment letters with a range of support, concern, and comments. All of the 30-day EA comments received by the close of the comment period were reviewed and considered by the decision maker and the ID team. All correspondence received during the life of this project has also been reviewed and considered by the decision maker and the ID team. Comments are located in the project record.

Specific written comments raised by commenters have been analyzed and responded to by the ID team. Specific written comments are within the scope of the proposed action, have a direct relationship to the proposed action, and must include supporting reasons for the responsible official to consider (36 CFR 218).

A number of comments had similar themes; therefore, representative comments were used in the response. Two or more comments may be addressed by a single discussion. Each comment is in italics under the appropriate topic, followed by a discussion of how it is being considered in this NEPA review.

The following tables provide a list of letters received during the 30-day comment period. Please note that if a commenter's name is missing from the following tables it does not mean that their comment(s) were not considered. Human error could result in a missed or misspelled name.

Table C-1. Letters Received During the 30-Day Comment Period for the Welcome Station Trail Connection EA

Author(s)	Individual or Organization
Lucas Freeman	Bike Around Bend
John Kelly	On behalf of DogPAC board
Byron Oburst	Individual
Tyler Deke	Individual
Kim Wilson	Individual
Deon Stonehouse	Individual
Gail Carbiener	Individual
Kreg Lindberg	Individual
David Pitts	Individual
Ross Winsor	Individual
Jeff Boulet	Individual

KEY COMMENT CATEGORIES

PATH DESIGN

PATH DESIGN	
Public Comment	**Consideration**
If a creative solution cannot be found to make Alternative B (section 2.3.2) workable, an underpass or overpass would be the best way to ensure your project's goal is met and monies spent on paving the trail are not wasted.	An alternative to construct a second underpass or overpass instead of using a surface crossing was considered but eliminated for detailed study for various reasons listed in Ch. 2.3 of the EA. Due to the location of the privately owned Widgi Creek Golf Course, the path would need to cross Cascade Lakes Highway east of the golf course (see Ch. 2.3 Alternative B). While a pedestrian undercrossing or overcrossing would eliminate the need for a surface crossing, ODOT was able to locate a safe location for a surface crossing, eliminating the need in the foreseeable future for a high cost underpass or overpass.
However, the at-grade crossing of the highway at FR4600 is a serious shortcoming. There are a large number of cars traveling at high speeds on that portion of the highway and having to cross it with only a few signs to warn motorists will not be a safe or pleasant option for walkers and people on bikes, especially those with young children. A tunnel or overpass are far safer alternatives that would keep pedestrians and people cycling separated from vehicle traffic and enhance the connectivity of the path as well as improve traffic flow. *If a tunnel or pedestrian bridge is not possible, something else needs to be done to slow traffic on that stretch and alert drivers of the crossing. Lowering the speed limit on that section of road and installing a bike/pedestrian signal would be a good way to allow for a safer, easier crossing. At least*	ODOT has determined that the proposed crossing is the safest crossing point for the public (Ch. 1.9.1 Issue #6). This location has the best sight distances for trail users and vehicles, is the shortest crossing distance of potential crossing locations, and minimizes the conflicts with turning movements. ODOT would retain responsibility to monitor and install traffic control devices to maintain a safe crossing. The crossing location would be signed with advance warning signs. ODOT may consider other controls to provide for public safety such as lowering the speed limit and establishing a crosswalk or other measures as needed. Coordination with ODOT would continue in order to install the most effective controls (Ch. 2.6.1 Recreation).

PATH DESIGN	
Public Comment	**Consideration**
having a painted crosswalk at minimum would be better than nothing.	
The EA does not determine safety on the paved Trail 1a. AASHTO has speed standards for paved trails. The EA does not determine if the grade will encourage excess speed that will create a safety issue with hikers and those pushing baby strollers. The EA on page 58 indicates that high speed cyclists will travel on the Cascade Lakes Highway, which is paved and has the same grade!	The paved path would not be at the same grade as the Cascade Lakes Highway. The paved path would meet Forest Service Trail Accessibility Guidelines (FSTAG). The path would be constructed to maintain a 5% grade across the majority of its length. In short sections where the grade exceeds 5% (e.g. the rise north of the highway undercrossing), the path would include areas to pull off the trail and rest. (Ch. 2.6.1 Resource Protection Measures pg. 38). AASHTO guidelines meets the needs of different types of users on paved shared use paths. The speed a bicyclist travels is dependent on several factors, including the type and condition of the bicycle; the purpose of the trip; the condition, location and grade of the path; the speed and direction of any prevailing winds; the number and types of users on the path; and the physical condition of the bicyclist. AASHTO recommends shared use paths "should be designed for a selected speed that is at least as high as the preferred speed of the faster bicyclists. In general, a minimum design speed of 20 mph should be used. Although bicyclists can travel faster than this, to do so would be inappropriate in a mixed use setting. The paved trail would allow for a multi-modal, recreation experience and visitor information and enforcement would be used as necessary to encourage the safe use of the paved facility including maintaining safe speeds, respecting other trail users, and maintaining safe control of dogs. (Ch. 3.4.1 Alternative 2 pg. 67) Road bikes would not be required to travel on Trail 1a and would continue to have the option of riding on the Cascade Lakes Highway should they wish to travel at high speeds on a road. Those wanting to travel at a high speeds would be encouraged to continue to use the shoulders of the Cascade Lakes Highway. (Ch. 3.4.1 Alternative 2 pg. 68)

PATH DESIGN	
Public Comment	**Consideration**

PARKING

PARKING	
Public Comment	**Consideration**
The parking strategy outlined in the EA will have a negative impact on the Good Dog! area. We feel that adding additional users in one large parking area will be detrimental to the existing users and the new users. We think it would make a much better project if the DNF provided several smaller parking areas. Ideally there would be a 20 car lot at the existing parking area and two 10 car lots at (one near Widgi Creek and one near the Entrada lodge). This will disperse the users instead of forcing a larger number of people into one area. Dispersed parking will reduce the chance of conflict and allow for different experiences for users depending on where they choose to park.	An alternative to construct several smaller trailhead parking areas instead of one new trailhead was considered but eliminated from detailed study because of reasons listed in Ch. 2.3.7. The trailhead parking was located where it is proposed because there is already dispersed parking in the area and the areas trees and natural depression would help screen the trailhead from the Cascade Lakes Science Byway. The intended use of the trailhead is to serve users of the proposed paved path as well as visitors currently accessing the area for dispersed recreation. (Ch. 2.4.2) Exiting conditions and effects from the existing Good Dog! areas dispersed parking and proposed trailhead construction is discussed in the Recreation section (Ch. 3.4.1). Providing parking for existing users and new use of Trail 1 was evaluated as a key issue. During scoping, comments raised concern that the proposed trailhead parking of 20 spaces was not sufficient to support existing and new use. (Ch. 1.9.3). As a result, Alternative 2 (Ch. 2.4.2) was modified to propose 40 spaces and Alternative 3 (Ch. 2.4.3) was created which would provide 22 spaces. Both alternatives would provide two accessible parking spaces. In the Recreation section (Ch. 3.4.1), Alternative 3 analyzed the effects of constructing a parking area in the proposed location with a parking capacity of 22 vehicles. It was determined that, given the existing use of the area and the anticipated use of the paved path, it is likely that use

PARKING	
Public Comment	**Consideration**
	would exceed the designed capacity of the trailhead. Constructing the trailhead parking with capacity of 40 vehicles in the site proposed in Alternatives 2 would safely accommodating the existing users of the dispersed parking area and the new users of the paved path, maintain scenic quality along the Byway and best meet the purpose and need for the project. (Ch 3.4.1) The Forest Service would work with members of DogPAC during the design of the trailhead to gain a better understanding of their concerns and incorporate design features to reduce the potential for conflict to the extent possible.

MAINTENANCE

MAINTENANCE	
Public Comment	**Consideration**
The Forest Service acknowledges that it has no funds for maintenance of paved paths.	Path maintenance would be accomplished by a combination of Forest Service maintenance schedule actions, pursuit of future path improvement grant opportunities and/or by exploring partnerships with stakeholders or non-profit entities. (Ch 2.6.1 Recreation) The Bend-Fort Rock Ranger District understands the need for short and long-term maintenance of paved paths and would endeavor to budget accordingly. Annual inspections would be performed and any problems would be addressed with as they arise.
Federal land management agencies are notorious for building infrastructure without providing for future maintenance (one recent documentation is Senator Coburn's October 2013 report on the National Park Service). Forest Service budgets have declined in real terms, and the DNF is not able to maintain its existing infrastructure. I do not believe it is appropriate to develop additional infrastructure without a viable maintenance strategy.	

SAFETY

SAFETY	
Public Comment	**Consideration**
Scoping comments concerning safety when crossing Cascade Lakes Highway has been made a non-key issue by stating on page 10: ODOT determined that the proposed location of Trail 1a crossing is the safest crossing point for the public. This location has the best sight distances for trail users and vehicles. Neither ODOT nor Forest Service says the crossing is safe! The EA should indicate what measures will be taken to protect the public when using the crossing. Since it is proposed to be located across from the Meadow day use area, vehicles will be turning into and out of the day use as well as continuing both ways on Cascade Lakes Highway.	ODOT has determined that the proposed crossing is the safest crossing point for the public (Ch. 1.9.1 Issue #6). This location has the best sight distances for trail users and vehicles, is the shortest crossing distance of potential crossing locations, and minimizes the conflicts with turning movements. The crossing location would be signed with advance warning signs to alert traffic that a pedestrian crossing is ahead, with a recommended reduction in speed, and double yellow lines. Discussions with ODOT over safety of the surface crossing and measures to take are ongoing (Ch. 2.6.1 Recreation). Reasonably foreseeable as defined in 36 CFR 220.3 are those Federal or non-Federal activities not yet undertaken, for which there are existing decisions, funding, or identified proposals. The roundabout referenced according to the definition provided is not a reasonably foreseeable event.
A crossing at the east end of the Good Dog! area, at the urban growth boundary (UGB),appears safer. Likewise, the DNF has too-easily dismissed a crossing at the future Tetherow roundabout. The creation of that roundabout is a foreseeable event that will dramatically reduce the danger of crossing Cascade Lakes Highway. The DNF should fully analyze alternatives with the paved trail being located north of the highway, with crossing at Entrada Lodge and the future Tetherow roundabout. The alternatives should take into account both current and potential future speed limits; I believe vehicle speeds at these eastern crossings will be noticeably lower than at the currently-proposed crossing.	
First, our climate leads to frost heaves in asphalted surfaces. Second, ponderosa pines drop their needles and cones. In the absence of a realistic maintenance strategy, these factors and others may lead to significant safety issues, especially for	The Bend-Fort Rock Ranger District understands the need for short and long-term maintenance of paved paths and would endeavor to budget accordingly. Annual inspections would be performed and any problems

SAFETY	
Public Comment	**Consideration**
children.	would be addressed with as they arise. (Ch 2.6.1 Recreation pg. 39)

FUNDING

FUNDING	
Public Comment	**Consideration**
This project goes way beyond the intent of the funding grant, by determining that additional mountain bike trails are needed in the area.	While the Federal Highways Administration Public Lands Highways Discretionary Program (PLHD) grant that would fund the majority of actions proposed in this project was secured prior to the development of the purpose and need, the Forest Service is not limited to derive a purpose and need that is bounded by this grant. Any approved actions not included in the PLHD grant would be funded by Forest Service appropriated funds, in-kind volunteer contributions, or fund secured through grants or other means. The Forest Service sees the need to add mountain bike trail connections between the Welcome Station and the existing trail systems. These trail connections would enhance the outstanding recreational qualities for central Oregon residents accessing public lands through the National Scenic Byway (Ch 1.5 Cascade Lakes Scenic Byway Corridor Management and Interpretive Plan). The Forest Plan also has a goal to provide additions or modifications to trail systems in order to meet increasing and changing demands in recreation (LRMP 4-2, 4-32). These goals helped generate the project's purpose and need to provide non-motorized paved trail connectivity between the Welcome Station and the City of Bend and mountain bike trail connections between the Welcome Station and the Wanoga, Deschutes River and Phil's trail systems. These trail additions would create alternative transportation options between the City of Bend and the Deschutes National Forest (Ch. 1.5) and would alleviate congestion along the Deschutes River Trail, enhancing the recreation ORV in the
The funding grant seems to provide for a paved path connection to the Welcome Station from the Bend haul road plus a parking lot expansion at Good Dog. What rational is used to expand the spending to construct mountain bike trails?	

FUNDING	
Public Comment	**Consideration**
	designated Wild and Scenic River corridor (EA pg. 68). Discussion of the project's funding is included in Chapter 1.9.1. The project is funded through the Federal Highways Administration Public Lands Highways Discretionary Program (PLHD) grant program. The grant application and award included funding for the planning, design and construction of mountain bike trails. The PLHD grant awarded for this project includes $35,000 of in-kind contribution (volunteer match) from Central Oregon Trail Alliance for the construction of mountain bike trails connecting existing trail systems to the Welcome Station. COTA has volunteered to assist in the construction of the proposed mountain bike trails and with the long-term maintenance of those trails.
The EA on page 9 omits indicating that the grant dollars are also to be used for the undercrossing.	The undercrossing was the result of a shared vision for trail connections between Bend, Sunriver, and the Welcome Station and was not financed by the National Scenic Byways Program grant funds. The undercrossing was constructed by ODOT during the 2012 Century Drive/Cascade Lakes Highway road maintenance project (Ch. 1.2). This project proposes to construct a paved path connection through the existing tunnel.

RESOURCE CONCERNS

RESOURCE CONCERNS	
Public Comment	**Consideration**
Recreation	
The EA on page 57 for Alternative #2 states: All proposed developments are within the standard parameters for the Roaded Natural ROS classification. For the Facilities and Site Management it is impossible to determine how the Forest	The determination for consistency with the existing ROS classifications (Appendix B) for Facilities & Site Management, Visitor Impacts and Visitor Management & Information is documented on page 59 of the EA. The native surface trails and unpaved trailhead parking area are consistent and compatible

RESOURCE CONCERNS	
Public Comment	**Consideration**
Service can make "inconsistent" acceptable when in fact the definition is closer to Unacceptable. The same is true for the Social Encounters; clearly the EA indicates "Moderate to high contact in developed sites on roads and trails" which is classed as inconsistent. These definitions have been interpreted in the past to allow conformity with an EA	with the Roaded Natural classification (Appendix B) and consistent with current improvements in the area. The path would be constructed using synthetic materials (asphalt), which is inconsistent, but acceptable within the Roaded Natural classification. Overall, the facilities and materials utilized for site management in the area would continue to fall within the range of 'compatible' with the Roaded Natural classification. It is also noted that a toilet would only be installed if needed to address sanitation concerns or changing public needs, a toilet could be installed. (EA 27, 42) The EA on pages 65-66 document that social encounters would be moderate to high and that this level of use is inconsistent, but not unacceptable, with the ROS classification of Roaded Natural.
The Upper Deschutes Wild and Scenic River Management plan provides for an annual recreation capacity of 44,000 non-commercial use days (EA page A-3). *The DNF often notes the past – and expected future – increases in recreation use, including on page 44 of the EA:* *Recreation use in the area is expected to increase as the population of Bend, Sunriver and surrounding communities increase and as the area draws more tourists to enjoy the recreation opportunities provided on the National Forest. As the residential development on the west side of Bend grows and the demand for alternative transit opportunities increases, the use of roads and trails providing direct connections between Bend and the Forest is expected to increase as well.* *Increased use has been stimulated by past DNF projects, by*	The proposed actions are intended to create new recreation opportunities outside of the Upper Deschutes Wild and Scenic River (UDWSR) corridor and to manage existing dispersed recreation and trail use within the UDWSR corridor. The existing condition and assessment of the no action alternative (Alternative 1) describe the current condition of social encounters within the UDWSR corridor as frequent and high contact with other visitors in developed recreation sites and on trails and a growing number of mountain bikers on the Deschutes River trail adding to trail congestion. (Ch 3.4.1 54-59 and 60-61) The expected effect of Alternative 2 is a reduction in the number of users and social encounters within the UDWSR corridor. The constructing a mountain bike trail from Tyler's Traverse trail up to the Storm King trail and the Cascade Lakes Highway hiker and pedestrian undercrossing (Trail 2a) would complete the connections between these popular trail systems outside of the UDWSR corridor and create an alternate route to the Deschutes River trail to get back to Bend and Sunriver. This would relieve trail congestion between Slough Day

RESOURCE CONCERNS	
Public Comment	**Consideration**
in-process and future projects noted in Table 3-2, and by projects omitted from that table. It is very likely that one outcome of the suite of projects (including this one) will be violation of this recreation capacity. Indeed, the DNF already may be in violation of it. To my knowledge, there has not been a scientifically sound assessment of use relative to this capacity.	Use and Bend, a high use section of trail. (Ch 3.4.1 pg. 68) In the Entrada area, the existing condition and assessment of the no action alternative describe the current condition as including informal parking areas that have developed off Cascade Lakes Highway along the access to the utility maintenance road (aka Good Dog!) and at the Meadow road turn-off to access National Forest System trails and non-system trails. While the informal parking areas are not within the UDWSR corridor, the system and non-system trails accessed by the parking areas can be used to access the UDWSR corridor. (Ch 3.4.1 56 and 59-60) Parking within the informal parking areas can become congested, creating a safety concern for drivers, pedestrians and pets. Both Alternatives 2 and 3 propose to construct a trailhead outside of the UDWSR corridor to safely accommodate users of the paved path as well as existing visitors currently parking in the informal parking areas. It is assumed that under all alternatives, including the no action alternative, recreation use within the project area (including the Upper Deschutes Wild and Scenic River corridor) would likely increase as the population of Bend and the nearby housing developments grows, and as central Oregon's outdoor recreation and tourism economy continues to grow. (Ch 3.4.1 53, 61, 66, 67, 72, 75) This effect is not a result of the proposed actions.
This project will continue to erode off-leash recreation by limiting the off-leash friendly area available in the only year round off-leash friendly area that is close to Bend and provides water access. It will also increase user density in the area. *There is a serious need to increase trail options for off-leash recreationists. DogPAC has made multiple requests for increased water accessible trails.* *This project provides the perfect avenue to address this issue*	Under 36 CFR 261.8 (d) dogs would be required to be on leash in the proposed developed trailhead. While this may be an inconvenience, a developed trailhead would resolve parking congestion and safety concerns that have developed at the existing dispersed parking area. This project does not change existing leash restrictions outside of the trailhead area (Ch 1.9.1). Additional trail opportunities that access the Deschutes River may be considered in the future however, trail opportunities accessing the river does not meet this projects purpose and need. The purpose and need of this project is to provide non-motorized paved trail connectivity between the Welcome Station and the City of Bend and between the Welcome Station and the

RESOURCE CONCERNS	
Public Comment	**Consideration**
by including additional off-leash friendly trails with water access in the EA. This could be by creating new trails, making user/wild animal created trails official and altering the rules on existing trails to allow off-leash dogs. These could be at Good Dog! and in the area between Meadow Camp and Benham Falls. A couple of ideas for the DRT in the summer would be an off-leash ban on weekends only, or a parallel trail with regular river access. There is support of this concept in the EA.	Wanoga, Deschutes River and Phil's trail systems. (Ch 1.2 and 1.5) The proposed trailhead is open to all users of the National Forest including those who choose to recreate with their dogs in the GoodDog! area.
Instead of the proposed paved path, would you consider paving Road 41 to provide access between Bend and Sunriver. Paving road 41 would serve cyclists better.	Paving Road 41 is outside of the purpose and need for this project, to provide non-motorized paved trail connectivity between the Welcome Station and the City of Bend.(Ch 1.5)
Wildlife	
Although I recognize the need to accommodate the increase in recreational use in our area, I am concerned about the impact of the proposed trail expansion on local wildlife species, in particular local elk and mule deer populations. Some of these trails would transect critical elk habitat and could possibly interfere with migration routes. This could be harmful to local populations of elk and may cause displacement of entire herds. This is also true of mule deer. Trails should not interfere with areas of heavy elk movement.	A key issue of potential impacts on key elk habitat (Ch. 1.9.3) was formulated and Alternative 3 (Ch. 2.4.3) was developed in response to this key issue. Comparison of how the alternatives respond to the key issues is located in Table 2-3 (Ch. 2.5). In Chapter 2.6 wildlife resource protection measure WL-RPM-5 would not encourage use of trails in the key elk area between December 1 and March 31. A detailed analysis of effects on elk is found in the wildlife section (Ch. 3.4.2) starting on page 81-84, 116-120 in the EA. This project is consistent with Forest Plan standards and guidelines (Ch 3.4.2 pg. 135, Appendix B)
The Forest Service should perform visitor counts during the winter season. No such hard data exists to make any educated estimate on elk impact. This winter count would provide guidance for the elimination of Tyler's Traverse and Storm King and not building Trail 2a, plus give data for future	Your comment has been noted. Proposed trails are intended for use during the spring, summer, and fall (Ch. 3.4.1 pg. 53). Resource protection measures (Ch 2.6.1 Wildlife) recommend that visitor use would not be encouraged between December 1 to March 31 in the key elk area to reduce potential disturbance to

RESOURCE CONCERNS	
Public Comment	**Consideration**
considerations of the paved path near Forest Road 41.	big game (WL-RPM-5). A detailed analysis of effects on elk is found in the wildlife section (Ch. 3.4.2) starting on page 81-84, 116-120 in the EA. Trail locations were identified in project planning to reduce some potential impacts to elk by keeping trails within approximately 150 feet of existing roads to minimize potential increased habitat fragmentation. Trails 1 and 2 are near roads that are open year-round. Elk are known to move across FSR 41 between winter and summer grounds and there is an identified migration area just south of Trail 2. Use of a single non-motorized trail may not be sufficient to impede elk movement but the additive effects of a new trail combined with the paved road and other existing trails may begin to alter elk movement between summer and winter range. These additional trails may slightly alter elk movements, especially during trail construction, which can affect hunter success but hunting opportunities would continue to be provided in the project area. (EA pg. 118-119) The overall direct, indirect and cumulative impacts of the project would result in a small increase in habitat disturbance. This would be insignificant at the forest scale because elk populations are expected to remain stable across the DNF. (EA pg. 120)
The Forest Service should consider obliterating segments of Tyler's Traverse and Storm King Trails and rehabilitating the forest traces, thereby removing even more human disturbance in the elk area. If trails 3, 4, and 6 were to be built there would still be an increase in trail miles. Since the future includes a paved path along forest road 41, the removal of Tyler's Traverse and Storm King and not building Trail 2a gives the elk a period of time to re-establish in the area.	
Water	
Paved trails will contribute to water runoff from rain and snowmelt. This may cause extreme erosion and degradation of the surrounding vegetation.	The paved path section is on flat to gentle terrain so rain and snowmelt would not concentrate on the path to form erosive energy. The highly permeable soils typical of the project area would quickly absorb run-off from the trail and minimize erosion and damage to surrounding vegetation.
There is also the issue of degradation to the rivers and streams as well as important riparian areas. Riparian areas are very critical to the health of the river and very fragile as well. Greater foot and bike traffic may lead to areas being trampled	The paved path is not located near any streams or riparian areas. At its closest point, this path is approximately 0.5 mile from the Deschutes River. Trail 2A, the mountain bike trail, crosses one intermittent and one ephemeral stream channel, but there is no riparian vegetation at the crossings. At its closest point, this mountain bike trail is approximately 0.5 mile from the Deschutes River.

RESOURCE CONCERNS	
Public Comment	**Consideration**
by people attempting to reach the river.	There would be no effects to riparian areas, intermittent or perennial channels, or aquatic species (Ch. 3.4.6).
Visuals	
Concerned about the visual effect of the paved path along Cascade Lakes Scenic Byway. The paved trail would look like a road paralleling the highway. The trail out of the tunnel would also create a negative impact to the view along the highway. Could the trail be offset further from the highway (greater than 300') to protect the view? Did you consider constructing the paved trail along the Deschutes river? Would you consider a dirt path instead of paved path?	The paved path would meet standards and guidelines for scenic quality because it is designed to provide an alternative form of non-motorized transportation that is removed from the roadway, provides accessibility, protect site resources and would enhance scenic views with the use of materials that blend with the surrounding landscape (Ch. 3.4.3).
Invasives	
The invasive plant risk rating for this project is High (page 131) "because there would be heavy equipment working at a known weed sites. Machinery has the potential to spread seeds present in the seedbank." *The situation is even more problematic when one considers that the DNF ignores cheatgrass, a significant issue in the area. In addition to its effect on the natural environment, cheatgrass also affects the human environment, especially given recreation patterns in the Good Dog area. Cheatgrass can work its way into canine paws, noses, and ear canals. Often, a costly vet visit is the result. I personally have incurred financial costs associated with cheatgrass in my dog's ears, and I know that many other dog owners have as well.* *The DNF appears to have "given up" on cheatgrass, but it is clearly an invasive and harmful plant (see, for example, the*	Cheatgrass is the most ubiquitous invasive plant on the Deschutes National Forest. Its far reaching establishment on the forest is past the point of controlling; therefore it is not considered a priority species for treatment. Cheatgrass is not on the Deschutes National Forest (DNF) list of noxious weeds nor is it on the Oregon Department of Agriculture's (ODA) list of noxious weeds because of its level of establishment. The weeds included in the DNF list and the ODA list are those that have a probability of either eradicating, controlling, or containing. The Bend-Fort Rock Ranger District understands the damage cheatgrass has caused not only to the local environment but also to animals. Currently our priorities do not include treating cheatgrass at this site and others across the Forest, but we realize this highly infested area is very popular with dogs and would like to seek cooperation through partnerships to assist with the removal of cheatgrass.

RESOURCE CONCERNS	
Public Comment	**Consideration**
first sentence of the 2012 Forest Service document http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5410110.pdf).	
The EA observes: "with this project and increased use, it can be expected that remaining seeds would be encouraged to germinate and grow. By inviting more public to use the area … the project area is susceptible to widespread infestations."	Resource protection measures (Ch. 2.6 Invasive Plants) such as washing machinery prior to conducting work, using weed-free fill material, and treating weed sites or avoiding significant sites prior to and during implementation would reduce the chance of weeds spreading and/or being introduced. These resource protection measures would help minimize introduction of invasive species during construction activities with the continued treatment of wees authorized in previous NEPA decisions it is anticipated that the spread of weed would be reduced. To help alleviate the concern that weeds would enter the new seedbed that would be created with this project, disturbed areas, in particular project areas which intersect with weed sites, would be seeded with locally adapted native seed making it more difficult for weeds to establish. Implementing the resource protections measures listed in Chapter 2.6 of this EA would reduce the risk of introduction and spread of weeds. (Ch. 3.4.5).
Heritage	
The EA on page 136 states; "During the 2013 field surveys, previous recorded sites within the area of potential effect were unable to be relocated." "Of the archaeological sites located, the sites have not yet sufficiently been evaluated for eligibility to the NRHP." *It is clear that the Heritage analysis has not been done or at best is incomplete. It is a trust me position that the forest service is asking those of us interested in archaeology and historic sites to take.* *The Cascade Lakes Byway Management Plan recognizes cultural sites exist and suggests interpretation. This is from*	Intensive archaeological surveys have been conducted over 100 percent of the APE in accordance with Section 106 of the National Historic Preservation Act. Survey methods are disclosed in Chapter 3.4.8 and in the inventory report that was submitted to SHPO. Site records were also researched during a prefield review. There were six archaeological sites that were discovered within the APE as a result of the surveys. Three of the sites are pre-contact in nature and associated with Native American resource exploitation. The remaining three sites are associated with historic railroad logging. None of the archaeological sites have been evaluated for their eligibility for listing on the National Register of Historic Places. Therefore, all of the sites will be treated as eligible until a formal determination of eligibility can be made, as per the Programmatic Agreement among the USDA Forest Service Region 6, the Advisory Council of

RESOURCE CONCERNS	
Public Comment	**Consideration**
the Plan: *Provide a connection with the culture and heritage of the area's indigenous people through interpretation and cultural tourism events on the Byway.* *Strategy 14: Tell the story of the connection to the ancestral lands along the Byway with the tribal communities in Central Oregon.* *Strategy 15: Develop and nurture partnerships with the tribal communities of Central Oregon in order to create more awareness for their history and heritage in these lands.* *The EA should disclose just how the 2013 survey was done, number of people involved, total area covered, and method of survey. Past recorded sites must be found and records obtained. Certainly the various tribes consulted will not accept this omission.*	Historic Preservation, and the Oregon State Historical Preservation Officer. All six sites will be flagged for avoidance prior to commencement of the project. The Bend-Fort Rock District has solicited information from the Tribes regarding this proposed project. In addition, copies of the cultural resource report have been provided to the Tribes upon request. Continued consultation and communication is occurring with interested Tribes regarding this project.

ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL ASSESSMENT	
Public Comment	**Consideration**
Purpose and Need	
The EA does not establish that additional mountain bike trails are necessary. … The need has not been established for additional mountain bike trails.	The projects purpose and need is to provide non-motorized access to the Welcome Station and existing Forest trail systems (Ch. 1.5). The proposed mountain bike trails would provide access (from the Welcome Station) to Tyler's Traverse, Wanoga mountain bike trail system, and Phil's trail system.

ENVIRONMENTAL ASSESSMENT	
Public Comment	**Consideration**
	Currently there is not an option for those visitors and residents wanting to access the Welcome Station and existing Forest trail systems in a non-motorized mode while removed from the Cascade Lakes Highway (i.e. not utilizing the highways shoulder). The need for connecting trails is based on the Forest's desired condition for creating connections to existing systems and alternative transportation options between the City of Bend and the Deschutes National Forest. A goal of the Cascade Lakes Scenic Byway Corridor Management and Interpretive Plan is to enhance the outstanding recreational qualities, regional significance to visitors, and enhancement of livability for central Oregon residents accessing public lands through the Byway. The Forest Plan also has a goal to provide additions or modifications to trail systems in order to meet increasing and changing demands in recreation (LRMP 4-2, 4-32). These goals helped generate the project's purpose and need to provide non-motorized paved trail connectivity between the Welcome Station and the City of Bend. In addition, the project would provide developed trailhead parking along the Cascade Lakes Highway near Bend and mountain bike trail connections between the Welcome Station and the Wanoga, Deschutes River and Phil's trail systems. (Ch. 1.5 pg. 1-2)
Cumulative Effects	
Importantly, the DNF does not even mention other current and foreseeable projects, including extension of the paved trail between Bend and Sunriver (including the already-approved Sunriver to Lava Lands Paved Path project) or the bridge connection to the Good Dog! area that was included in the recent Bend Park and Recreation District bond measure.	Reasonably foreseeable actions are defined in 36 CFR 220.3 (Ch. 3.2). As discussed in Chapter 3.2 the analysis area is the project area unless the resource being analyzed necessitates extending the analysis area outside the project area for an appropriate analysis. The list of past, present, and future actions (Table 3-2) are for activities within the project area and on immediately adjacent public and private lands. The extension of the paved trail between Bend and Sunriver is not a reasonably foreseeable action, the bridge connection to Good Dog! is speculative at this point and not consider a reasonably foreseeable action. The already approved Sunriver to Lava Lands Paved Path project is outside the analysis area that defined in the EA (Ch. 1.3 pg. 3-4, Ch. 1.7 pg. 3-8, Ch. 3.2 pg. 36-41).

ENVIRONMENTAL ASSESSMENT	
Public Comment	**Consideration**
	The wildlife analysis area for cumulative effects extends to the entire North Unit Diversion Dam watershed used for elk and mule deer (EA pg. 80). The key issue of managing for recreation in a key elk area evaluated a portion of the Sunriver to Lava Lands paved path that is yet to be constructed. Discussion of this and effects are located in the EA (Ch 3.4 pg. 81-84)

OTHER COMMENTS

OTHER COMMENTS	
Public Comment	**Consideration**
The Deschutes County Committee on Recreation Assets, referenced in the EA, has supported use of taxpayer funds to facilitate recreation participation rather than to create interpretive signs and information. In its June, 2010, appeal of the proposed welcome station, it noted "since public funds are limited, we think resources should go toward projects that directly enhance the recreation experience of our residents and visitors." That is, trails and associated parking should be prioritized over interpretive signs and facilities. *The Forest Service's own research and monitoring indicates that interpretive signs are not needed. As indicated in Table 19, page 32, of the Deschutes National Forest National Visitor Use Monitoring Results (February 2009 report), the importance-performance rating for "Interpretive display" was categorized as "Possible overkill."* *As described in that report, "possible overkill" refers to "items that are not highly important to visitors…."*	Your comment has been noted. As described in Chapter 2.4 Alternatives interpretive signs and information for visitors would be located at the trailhead. Interpretation of the 1990 Awbrey Burn is identified as a second priority for enhancement and development in the Cascade Lakes Scenice Byway Corridor Management Plan. Interpretive facilities within the Cascade Lakes Scenic Byway corridor are consistent with the Cascade Lakes Scenic Byway Corridor Management Plan and visual guidelines (Ch. 3.4.3). Figure 3-7 provides an example of what the proposed kiosk along the Cascade Lakes Highway would look like.

OTHER COMMENTS	
Public Comment	**Consideration**
Remove the interpretive components of this project to avoid squandering taxpayer dollars and detracting from the natural scenery in the area.	
The visual effect of the 1990 fire is quickly disappearing under golf courses, new homes and vegetation regrowth. Encouraging the general public, when using the Byway via automobile, to pull off into a gravel parking lot primarily used by the bicycling public, is not safe and will cause confusion and likely will over fill the parking lot. An interpretative sign that informs the bicycling public about erosion and safe travel would apply directly to the users. *Move the Awbrey Hall fire interpretative sign to the Welcome Station if interpreted at all.*	While the visual signs of the Awbrey Hall fire may be disappearing, interpreting the Forest Service and the public's role and responsibility in wildfire prevention in the wildland urban interface remains a high priority (Cascade Lakes Science Byway Corridor Management Plan). The interpretive signs at this site are intended to enhance the recreation experience and provide conservation education to the intended users of this site (bicyclists, hikers and runners). There is no intention to identify this site as an interpretive site or to direct highway users to the site solely for the interpretive signs.