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Meissner Sno-Park and Nordic Trails

Bend/Ft. Rock Ranger District, Deschutes National Forest
Deschutes County, Oregon

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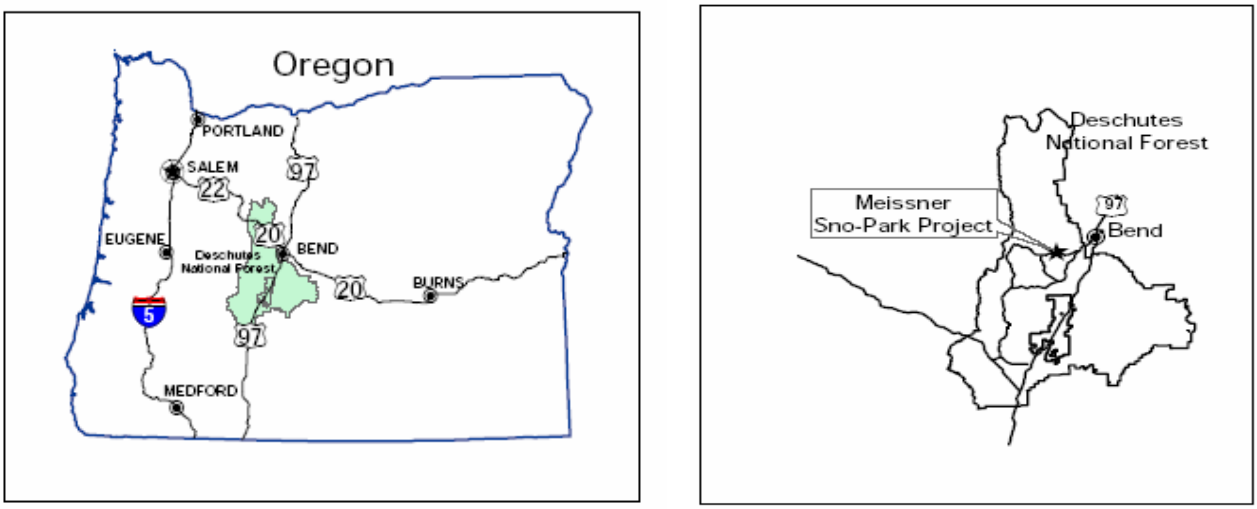
CHAPTER 1 – PURPOSE AND NEED

Introduction

The proposed Meissner Sno-park project was presented to the Forest Service by the Tumalo Langlauf Club (TLC). The TLC is a non-profit 501(c)(3) organization with approximately 210 members and a chapter of the Oregon Nordic Club.[1] The proposal is based on a vision statement and strategic plan developed by the TLC to provide expanded winter Nordic recreational opportunities for the public.

The Meissner Sno-park area is located approximately 10 miles southwest of Bend, Oregon, bordered on the south by Cascade Lakes Highway (Highway 46) with entry to the parking area by way of Forest Road 4615. Refer to the general vicinity map and project locator maps (Figure 1).

Figure 1: General Vicinity Map of the Deschutes National Forest and Locator Map of the Meissner Sno-Park adjacent to State Highway 46



Background and Existing Condition

For approximately eight years, TLC has been granted a permit to groom about 14.3 miles of ski trails at the Meissner Sno-Park area, three days per week from December 1 through March 31. In addition to the groomed trails, there are approximately 12.3 miles of un-groomed ski trails and approximately 7.6 miles of snowshoe trails.

Located approximately 15 minutes from the city limits, this sno-park is very popular with the skiing public. Many times throughout the winter, particularly on weekends, the 60 space parking area is filled to capacity, with overflow parking occurring along Forest Road 4615, the entry road from Highway 46.

[1] The focus of the TLC club is to provide groomed trails for community use, facilitate access to the sport of cross-country skiing, and conduct social and skiing activities for club members. In addition, TLC collaborates with the Central Oregon Nordic Club and other organizations sharing the TLC mission. Current partners and stakeholders include Central Oregon Community College (COCC) and Bend Metro Parks and Recreation District (BMPRD), local Central Oregon High School ski teams and XC Oregon. Current user groups include the Mt. Bachelor Sports Education Foundation and Central Oregon Nordic Club.

Increases in Central Oregon population and tourism have increased recreation demands in Central Oregon, known for year-round recreational opportunities. Present projections indicate a continued increase in population, visitation, and recreation use. The popularity of cross country skiing is one of the winter opportunities that continues to grow and the project area is accessible and close to the Bend urban area.

Desired Condition and Management Direction

In 2003, TLC created a vision statement and strategic plan for the development of a community ski area sno-park that would be expanded and dedicated to providing a non-commercial, community ski area for winter non-motorized recreational opportunities. The strategic plan included proposed improvements that would provide a wide array of opportunities for beginning skiers as well as world-class competitive racers. Snowshoe use would continue as a current use, with snowshoe trails paralleling cross country ski trails.

The Deschutes National Forest Land and Resource Management Plan (LRMP), 1990, as amended by the Northwest Forest Plan (NWFP), 1994, provides management direction for the Forest. The project area falls within Matrix under the Northwest Forest Plan Allocation. Matrix is federal lands outside the other designated areas where most timber harvest or other silvicultural activities are conducted. It also includes non-forested areas, and forested areas that are technically unsuitable for timber production (C-39). The project area is included within the following LRMP Management Areas (MA). Relevant S&Gs for each management area follow management area descriptions. Unless directly superceded by standards and guidelines in the NWFP, the LRMP standards and guidelines remain in effect.

- General Forest (MA-8): Timber production is to be emphasized while providing forage production, visual quality, wildlife habitat, and recreational opportunities for public use and enjoyment (LRMP, page 4-117).

M8-2: *"Traditional … or areas where concentrated recreation use occurs will be recognized as being significant in producing and utilizing dispersed recreation opportunities. …"*

- Scenic Views (MA-9): Provide high quality scenery representing the natural character of central Oregon. Landscapes seen from selected travel routes and use areas are to be managed to maintain or enhance their appearance. To the casual observer, results of activities either will not be evident, or will be visually subordinate to the natural landscape (LRMP, page 4-121). Foreground and midground scenic views are present.

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.*

- Winter Recreation (MA-13): Provide quality winter recreation opportunities within a forest environment that can be modified for visitor use and satisfaction (LRMP, page 4-143).

M13-1: *"The emphasis is to manage the area for dispersed, winter-type, recreational activities. Dispersed recreation use in the summer is compatible but not emphasized."*

M13-2: *"Cross-country skiing and over the snow vehicle trails will be provided but will be located and designed to separate motorized and non-motorized use in order to minimize conflict and to keep hazards to a minimum. Parking lots, shelters, and visibly signed routes are necessary to support the recreational activity. This Management Area can be zoned to minimize conflicts between motorized winter activities and non-motorized activities. Individual roads or trails can be designated for separate uses. Areas closed to motorized activities will be shown in the Off-Highway Vehicle (OHV) Plan. Areas closed to motorized activity could change as use patterns change. The OHV Plan would be amended to show such changes."*

M13-11: *"Management activities will meet Modification or a higher objective. Activities may include snoparks, shelters, signs, bulletin boards, and vegetative openings for play areas or views."*

Purpose and Need for Action

With the rapid growth of Central Oregon, and the associated growth of winter sports, more ways to accommodate non-motorized winter recreational experiences are being sought.

The Desired Condition is a site that:

- Is close to the urban area is important because it takes less time and gas to get there;
- provides opportunities for Nordic skiing, and can accommodate various abilities of the recreating public;
- Receives enough snow at lower elevations to allow winter activities to into March or April,
- Is free to the public, with winter snow park passes;
- Provides trail and other information about the Sno-park
- Provides lighting that extends daily use and provides an element of safety for those skiing in the evening during the winter;
- Provides a staging area for skiers, particularly during events;
- Offers a shelter that would also allow large groups a place to congregate before, during, and after race events.

Current condition:

The Meissner Sno-park is located approximately 10 miles from the Bend city limits (15 minutes during the winter). Local high schools, colleges and other groups need to drive 19 miles (a minimum of one-half hour) to Mt. Bachelor or other sno-parks to participate in Nordic events.

Presently, the Meissner Sno-park has parking for approximately 60 vehicles. It is not uncommon for weekend users to experience a full parking area with other vehicles parked on either side of Forest Road 4615 out to Highway 46. This high use causes congestion of vehicles and people, increasing the risk of accidents.

- There is a need to increase parking capacity to reduce parking congestion and improve safety and allow more people to visit the Sno-park.

There is no area of the sno-park that is designated or user friendly as a staging area to prepare for Nordic skiing. Normally, preparation occurs in or adjacent to the parking area. There is also no adequate trail or other Forest Service information for users of this sno-park.

No shelter is provided at the beginning of the Nordic trails to escape the natural elements during inclement weather, to socialize, prepare for skiing or snowshoeing, or to have a place to sit and have a meal.

- There is a need to provide a shelter/lodge that is large enough to accommodate the general public and groups.

There is also an interest in using this area for Nordic race events. There is no area that is large enough for a large group to begin or end a race, or that is adequate for spectators to observe or wait while the race is occurring.

- There is a need for a staging area for public users, including racers, that is safe, close to parking, and provides adequate and detailed information regarding the sno-park.

The one vault toilet located within the parking median will not sufficiently accommodate the future number of users.

- With an increase in the number of users there is a need to provide additional toilet facilities.

Proposed Action

This project proposes to meet the purpose and need with the following actions:

1) Change the sno-park name;
2) Develop new non-motorized winter ski trails and a terrain park and relocate snowshoe trails;
3) Where necessary, widen existing trails for grooming;
4) Provide additional snow grooming of trails;
5) Develop a staging area for cross country ski racing events, with bypass bridge, and a kiosk;
6) Provide lighting for night skiing on some trails;
7) Build a lodge;
8) Provide an additional pit toilet;
9) Expand the parking area; and
10) Improve the pole barn that houses the grooming equipment and snowmobile.

The activities would be paid for and maintained by the TLC. The proposed action is described in more detail beginning at page 10. Three alternatives are provided: Alternative 1 (No Action), Alternative 2 (Proposed Action), and Alternative 3.

Public Involvement/Scoping Process Used

This project was made available for initial public comment on June 1, 2006. A letter requesting public involvement was mailed to approximately 77 individuals, businesses, and organizations. Included in this mailing were the Confederated Tribes of Warm Springs, Burns Paiute Tribe, and The Klamath Tribe. Also included in the mailing was The Bulletin, the local newspaper that reported on the proposed project area. Announcement of the proposed action was included in the Schedule of Projects (Located on the Deschutes National Forest website) starting in the winter of 2006 issue.

Written comments, letters, electronic mail responses or phone calls were received from 82 individuals, agencies, businesses, and organizations in response to this scoping effort. Comments received during scoping are a part of the Project Record. All comments received during the scoping period were considered during the analysis process. No written or verbal communication regarding the project was received from any of the three mentioned tribes.

Identification of Issues

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

Comments received were placed into the following categories:

- **Key issues:** Issues used to develop alternatives or specific activities of the action alternatives. These are issues that respond to the Purpose and Need that cannot be resolved without some consideration of the trade-offs involved. Trade-offs can be more clearly understood by developing alternatives and displaying the relative impacts of these alternatives.
- **Analysis issues:** In addition to the key issues, other environmental components are considered in the analysis in Chapter 3. Though they did not result in differing design elements between alternatives, these issues are important for providing the Responsible Official with complete information about the effects of the project.

Key Issues

The action alternatives respond to the key issue identified during initial project scoping, both public and internal. Attributes and measures for each issue will help to provide a comparison between alternatives. A summary comparison is provided at the end of Chapter 2. Scoping revealed one key issue:

Key Issue: Recreation Experience

Issue statement: Some members of the public feel that the proposed warming shelter is too large, that lighting on 5 km of trail is not necessary, and that the parking area would not need to be expanded to 180 spaces. They feel that the proposed action is too grandiose, and would change the atmosphere of this small sno-park. This issue will be assessed by the following measures: 1) size of warming shelter, 2) presence or absence of lighting, 3) number of parking spaces available.

Analysis Issues

Other issues that did not result in different alternatives or design elements were considered during the analysis process and are discussed in Chapter 3. These issues are generally less focused on the elements of Purpose and Need than is the Key Issues, and reflect the discussions of the effects of the proposed activities. These issues are important for providing the Responsible Official with complete information about the effects of the project.

Wildlife: Potential effects to Proposed, Endangered, Threatened, and Sensitive (PETS) wildlife species and their habitat were considered. Proposed management activities have the potential to impact the habitat of some species that may utilize the area. Management Indicator Species and landbirds are also addressed.

Botany and Invasive Plants: Potential effects to Proposed, Endangered, Threatened, and Sensitive (PETS) plant species were considered and no PETS plants were found in the project area. Proposed management activities have the potential to introduce or spread existing populations of invasive plants and invader species. Potential spread of invasive plants is a concern across the project area.

Water Resources and Fisheries: There is very little surface water in the project area, and no fish are present. The analysis disclose effects to riparian reserves as well.

Soils: The discussion of soil effects is focused on the proposed locations of new facilities and upgrades to existing facilities. The analysis was conducted to ensure acceptable soil productivity is maintained

for the growth of desired vegetation in the area. Project design features are incorporated into the proposal to minimize or reduce potentially adverse impacts to soils.

Scenery: Foreground views from Highway 46 looking toward the sno-park. Proposed parking and building activities have the potential to allow more distant views into the sno-park. The proposed action could also reduce the visual impact from parking along the 4615 access road.

Cultural Resources: Proposed activities were assessed for potential effect to cultural resources. Proposed ground-disturbing activities have the potential to disturb unknown sites. Known sites would be avoided.

Current Laws & Regulations

Development of this Environmental Assessment follows implementing regulations of the National Forest Management Act (NFMA); Title 36, Code of Federal Regulations, Part 219 (36 CFR 219); Council of Environmental Quality, Title 40; CFR, Parts 1500-1508, National Environmental Policy Act (NEPA). Many federal and state laws, including the Forest and Rangeland Renewable Resources Act (RPA), Endangered Species Act, Clean Air Act, and Clean Water Act also guide this analysis. The following is a brief explanation of each of these laws and their relation to the current project planning effort.

The American Antiquities Act of 1906: The American Antiquities makes it illegal to appropriate, excavate, injure, or destroy any historic, prehistoric ruin or monument, or any object of antiquity, situated on lands owned by the Government of the United States, without permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated.

The National Historic Preservation Act of 1966, as amended: The National Historic Preservation Act requires Federal agencies to consult with American Indian Tribes, State and local groups before nonrenewable cultural resources, such as archaeological and historic structures, are damaged or destroyed. Section 106 of this Act requires Federal agencies to review the effects project proposals may have on the cultural resources in the Analysis Area.

The Endangered Species Act of 1973, as amended: The Endangered Species Act is 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 species and threatened species, and to take such tests 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."

The National Environmental Policy Act (NEPA) of 1969, as amended: The National Environmental Policy Act is "To declare a national policy which will encourage productive and enjoyable harmony between man and his environment, to promote efforts which will 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 Council on Environmental Quality (CEQ) promulgated the regulations for implementing NEPA (40 CFR parts 1500-1508). The CEQ has recently provided guidance on considering past actions in cumulative effects analysis (Memo to Heads of Federal Agencies, June 24, 2005).

The National Forest Management Act (NFMA) of 1976: The National Forest Management Act guides development and revision of National Forest Land Management Plans and has several sections to it

ranging from required reporting that the Secretary must submit annually to Congress to preparation requirements for timber sale contracts. There are several important sections within the act, including Section 1 (purpose and principles), Section 19 (fish and wildlife resources), Section 23 (water and soil resources), and Section 27 (management requirements).

Multiple-Use Sustained-Yield Act of 1960: The Multiple Use – Sustained Yield Act of 1960 requires the Forest Service to manage National Forest System lands for multiple uses (including timber, recreation, fish and wildlife, range, and watershed). All renewable resources are to be managed in such a way that they are available for future generations. The harvesting and use of standing timber can be considered a short-term use of a renewable resource. As a renewable resource, trees can be re-established and grown in again if the productivity of the land is not impaired.

Migratory Bird E.O. 13186: On January 10, 2001, President Clinton signed an Executive Order (E.O. 13186) titled "Responsibilities of Federal Agencies to Protect Migratory Birds." This E.O. requires the "*environmental analysis of Federal actions, required by NEPA or other established environmental review processes, evaluates the effects of actions and agency plans on migratory birds, with emphasis on species of concern.*"

Executive Order 13112 (invasive species): This 1999 order requires Federal agencies whose actions may affect the status of invasive species to identify those actions and within budgetary limits, "(i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species… (iii) monitor invasive species populations… (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded;…(vi) promote public education on invasive species… and (3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species… unless, pursuant to guidelines that it has prescribed, the agency had determined and made public… that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions."

Project Record

This EA hereby incorporates by reference the Project Record (40 CFR 1502.21). The Project Record contains Specialist Reports and other technical documentation used to support the analysis and conclusions in this EA. Chapter 3 provides a summary of the Specialist Reports in adequate detail to support the decision rationale.

Incorporating these Specialist Reports and the Project Record help implement the Council on Environmental Quality (CEQ) Regulations provision that agencies should reduce NEPA paperwork (40 CFR 1500.4), that the document shall be "analytic rather than encyclopedic," and that the document "shall be kept concise and no longer than absolutely necessary" (40 CFR 1502.0). The objective is to furnish adequate site-specific information to demonstrate a reasoned consideration of the environment impacts of the alternative and how these impacts can be mitigated, without repeating detailed analysis and background information available elsewhere. The Project Record is available for review at the Bend-Fort Rock District Office, 1230 NE Third Street, Suite A-242, Bend, Oregon, Monday through Friday 7:45 a.m. to 4:30 p.m.

Scope of Project and Decision Framework

The scope of the project and the decision to make are limited to: new Nordic trail construction, additional grooming of trails, lighting of a trail for night skiing, development of a staging area for Nordic events, construction of an informational kiosk, construction of a day use shelter, construction of a vault toilet, and

expansion of the parking area. Chapter 2 details the designs of these actions. The project is limited to National Forest System lands within the project area.

The Responsible Official for this proposal is the District Ranger of the Bend-Fort rock Ranger District of the Deschutes National Forest. Based on response from the 30-day comment period, any changes made for the Final EA, and the disclosed analysis with mitigation, the Responsible Official will make a decision and document it in a Decision Notice. The Responsible Official can decide to:

- Select Alternative 2 (Proposed Action) or Alternative 3, the action alternatives that have been considered in detail, or
- Modify an action alternative, or
- Select the no-action alternative, and
- Identify what mitigation measures would apply.

The decision regarding which actions to implement will be determined by comparing how each factor of the project purpose and need is met by each of the alternatives and the manner in which each alternative responds to the key issues. The alternative that provides the best mix of prospective results in regard to the purpose and need and the key issues will be selected for implementation.

CHAPTER 2 – ALTERNATIVES INCLUDING THE PROPOSED ACTION

Introduction

This chapter describes and compares the alternatives that were considered for the Meissner Sno-park Project. A description of each of the actions, or design elements of those actions, that are proposed in varying degrees in the fully developed action alternatives is provided. This relationship is further discussed under each resource in Chapter 3, "Environmental Consequences."

Alternatives are presented in comparative form, defining the differences between each alternative and providing a clear basis for choice among options to the decision maker and the public. The information used to compare the alternatives is based upon the design of the alternatives

Description of Activities

The descriptions of proposed activities and mitigation activities are described for both Alternative 2 (Proposed Action) and Alternative 3. They were prepared to provide the reader with a reference regarding the activities that would occur for each action alternative. Following this discussion, a comparison table for the existing developments and the proposed activities is provided. The activities and there effects to the environment are described in Chapter 3, Environmental Consequences.

Alternative Descriptions

Alternatives were developed by the Interdisciplinary Team to address the Purpose and Need and key issues that were brought forward through public and internal comment. Three alternatives are analyzed in detail. Action alternatives meet the purpose and need for action in varying degrees.

Alternative 1 (No Action)

Alternative 1 is the No Action alternative. This alternative is required by law and serves as a baseline for comparison of the effects of all of the alternatives. Under Alternative 1, there would be no change in current management direction or in the level of ongoing management activities within the project area, such as sno-park maintenance or hazard tree removal.

No change to the existing sno-park would occur. Vehicle parking would continue to overflow from the designated parking area to Forest Road 4615 and along Highway 46, particularly during weekends and holidays. The current trail system would remain the same, both groomed and ungroomed trails. Night skiing would continue without the use of artificial lighting along approximately five kilometers of trail. The terrain park that would provide skiers an area to improve their skiing skills would not be developed. The staging area for racing events and the general public would not be developed. A warming shelter, additional toilet facilities for the increased public use of the area, and informational kiosk would not be constructed.

Alternative 2 (Proposed Action)

Alternative 2 is the proposed action. This alternative was developed to address the desire and need for improvements at the Meissner Sno-park. Table 1 displays the need for action and how that need would be addressed.

Table 1: Alternative 2 – Proposed Actions for the Meissner Sno-park

Need for Action	Proposal for Action
To offer new opportunities for various skill levels of Nordic skiers, there is a need to provide a variety of new trails.	9.7 miles, 18 feet wide (Figures 6 & 7)
To accommodate additional trail grooming, there is a need to remove vegetation along the sides of existing roads and trails.	9.1 miles, 18 feet wide
To expand the opportunities for all Nordic skiers, there is a need to expand the grooming area to include the proposed numbers 1 and 9 trails.	Trail number 1 is between Highway 46 and the Tangent Loop Trail; Trail number 9 is north of Forest Road 4615080
To provide longer, safer use of the sno-park trails for both beginning skiers and children there is a need to install low impact lighting.	Initially, 3 km (1.9 miles) with an additional 7 km (4.3 miles)
To develop and improve ski skills for adult beginning skiers and children there is a need to provide an area for a terrain park	300 feet by 600 feet (4.2 acres) West side of Forest Road 4615
To provide warmth, shelter, and a location for groups to gather, particularly during race events, there is a need to provide a warming shelter that is easily accessible to the parking area. This shelter would provide a warming area, changing rooms, and a small kitchen.	2,748 square feet Immediately northeast of the parking area (Figure 2)
To accommodate increases in public use and to reduce illegal parking along Forest Road 4615 and Highway 46 there is a need to increase the capacity of the existing designated parking area.	Increase the parking area from the present 60 spaces to 180 spaces. Approximately 1.5 acres would be affected (Figure 3).
To help meet the increased demands of the public there is a need for an additional toilet facility.	Construct double vault toilet immediately adjacent to the parking area.
To provide a focal point at the head of the trail system and provide an area for group events, including instructional and competitive, there is a need to provide a staging area.	150 feet by 300 feet (1 acre), tree removal Immediately to the north of the parking area, adjacent to the warming shelter (Figure 6)
To provide a maps, information, and history of the area and to designate the start of the trail system, there is a need to construct an informational kiosk.	Roofed signboard adjacent to parking area within staging area
To provide a cleaner storage area and provide a better space to do repairs in the pole barn that provides storage of the snow groomer and equipment, snowmobile, and supplies, there is a need to have a better surface for the floor other than dirt.	Replace the dirt floor with a concrete floor

Figure 2: Alternative 2 (Proposed Action) Warming Shelter – 2,748 Square Feet

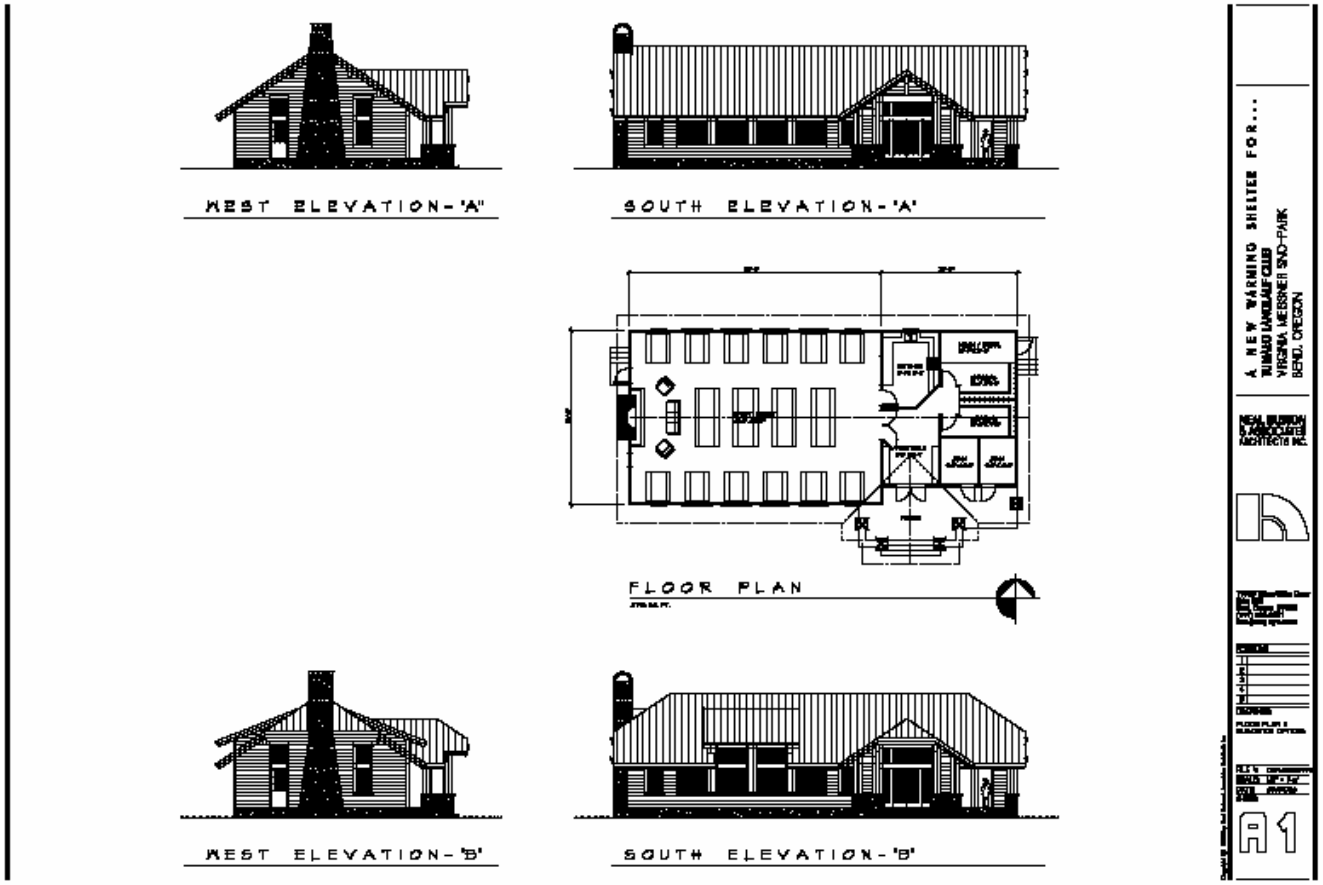
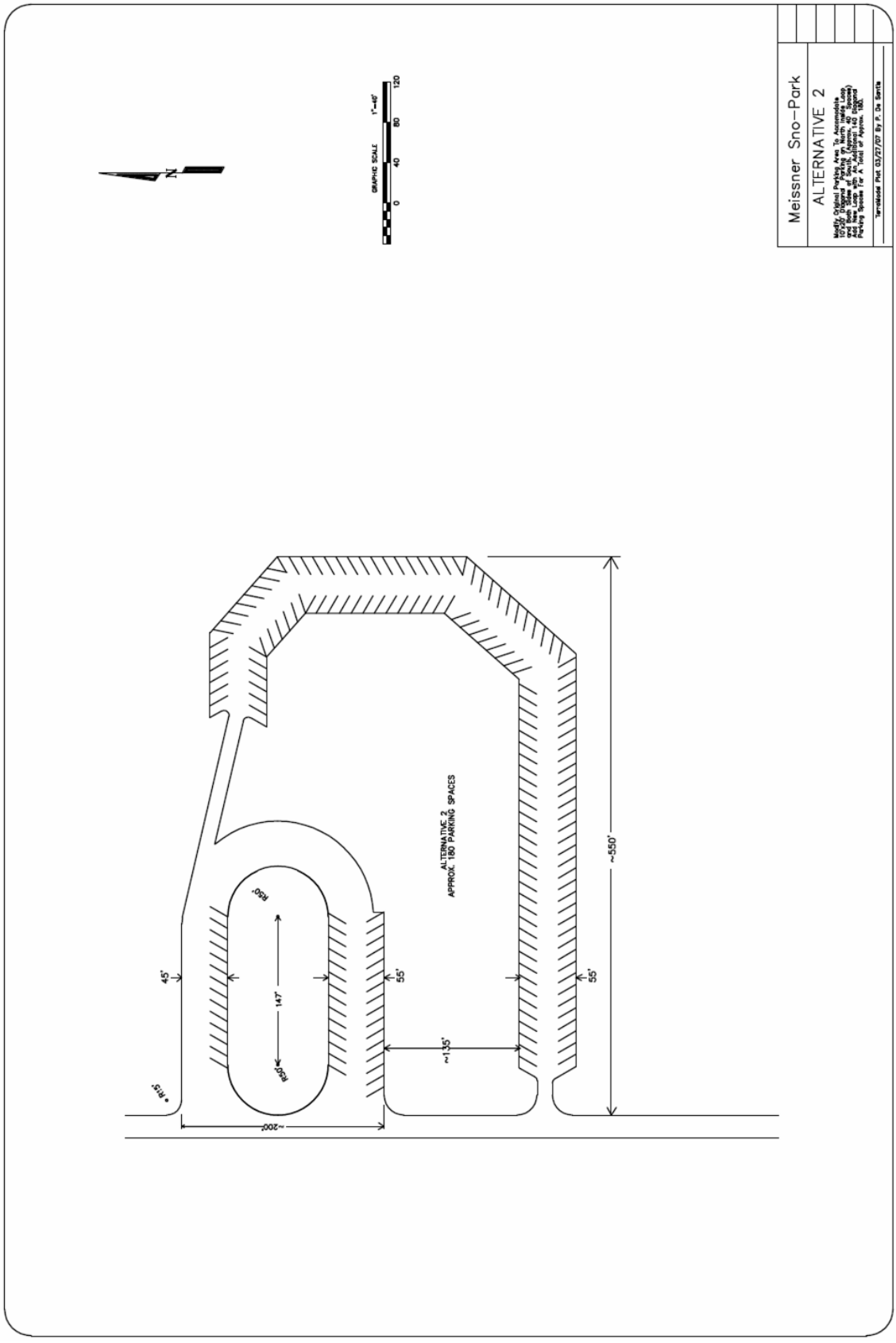


Figure 3: Alternative 2 (Proposed Action) Proposed Parking Area – 180 Vehicle Spaces



Alternative 3

Alternative 3 was developed to address the Key Issue as discussed in Chapter 1. This alternative would continue to meet the purpose and need by proposing a smaller parking area and smaller warming shelter. There would be **no** lighted trails and there would be a net increase in ungroomed trails. Table 2 displays the need for action and how that need would be addressed.

Table 2: Alternative 3 – Proposed Actions for the Meissner Sno-park

Need for Action	Proposal for Action
To offer new opportunities for various skill levels, there is a need to provide a variety of new trails.	7.8 miles, 18 feet wide (Refer to Figure 6 & 7)
To accommodate additional trail grooming, there is a need to remove vegetation along the sides of existing roads and trails.	11 miles, 18 feet wide
To expand the opportunities for all Nordic skiers, there is a need to expand the grooming area to include the proposed numbers 1 and 9 trails.	Trail number 1 is between Highway 46 and the Tangent Loop Trail; Trail number 9 is north of Forest Road 4615080
To develop and improve ski skills for adult beginning skiers and children there is a need to provide an area for a terrain park	300 feet by 600 feet (4.2 acres) West side of Forest Road 4615
To provide warmth, shelter, and a location for groups to gather, particularly during race events, there is a need to provide a warming shelter that is easily accessible to the parking area. This shelter would provide a warming area, changing rooms, and a small kitchen.	1,370 square feet Immediately northeast of the parking area (Refer to Figure 4)
To accommodate increases in public use and to reduce illegal parking along Forest Road 4615 and Highway 46 there is a need to increase the capacity of the existing designated parking area.	Increase the parking area from the present 60 spaces to 120 spaces. Approximately 1.0 acres would be affected (Refer to Figure 5).
To help meet the increased demands of the public there is a need for an additional toilet facility.	Construct double vault toilet immediately adjacent to the parking area.
To provide a focal point at the head of the trail system and provide an area for group events, including instructional and competitive, there is a need to provide a staging area.	150 feet by 300 feet (1 acre), tree removal Immediately to the north of the parking area, adjacent to the warming shelter (Refer to Figure 6)
To provide a maps, information, and history of the area and to designate the start of the trail system, there is a need to construct an informational kiosk.	Roofed signboard adjacent to parking area within staging area
To provide a cleaner storage area and provide a better space to do repairs in the pole barn that provides storage of the snow groomer and equipment, snowmobile, and supplies, there is a need to have a better surface for the floor other than dirt.	Replace the dirt floor with a concrete floor

Figure 4: Alternative 3 (Proposed Action) Warming Shelter – 1,370 Square Feet

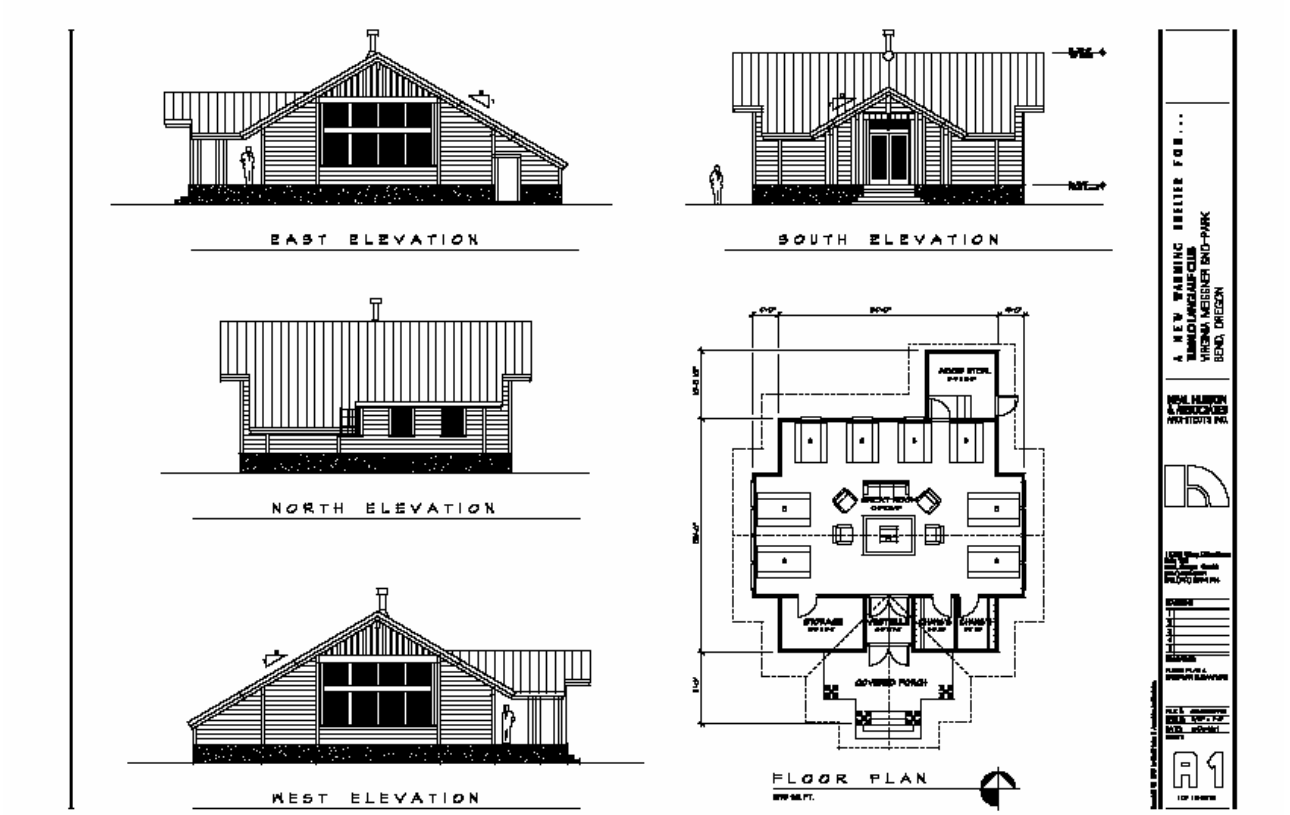
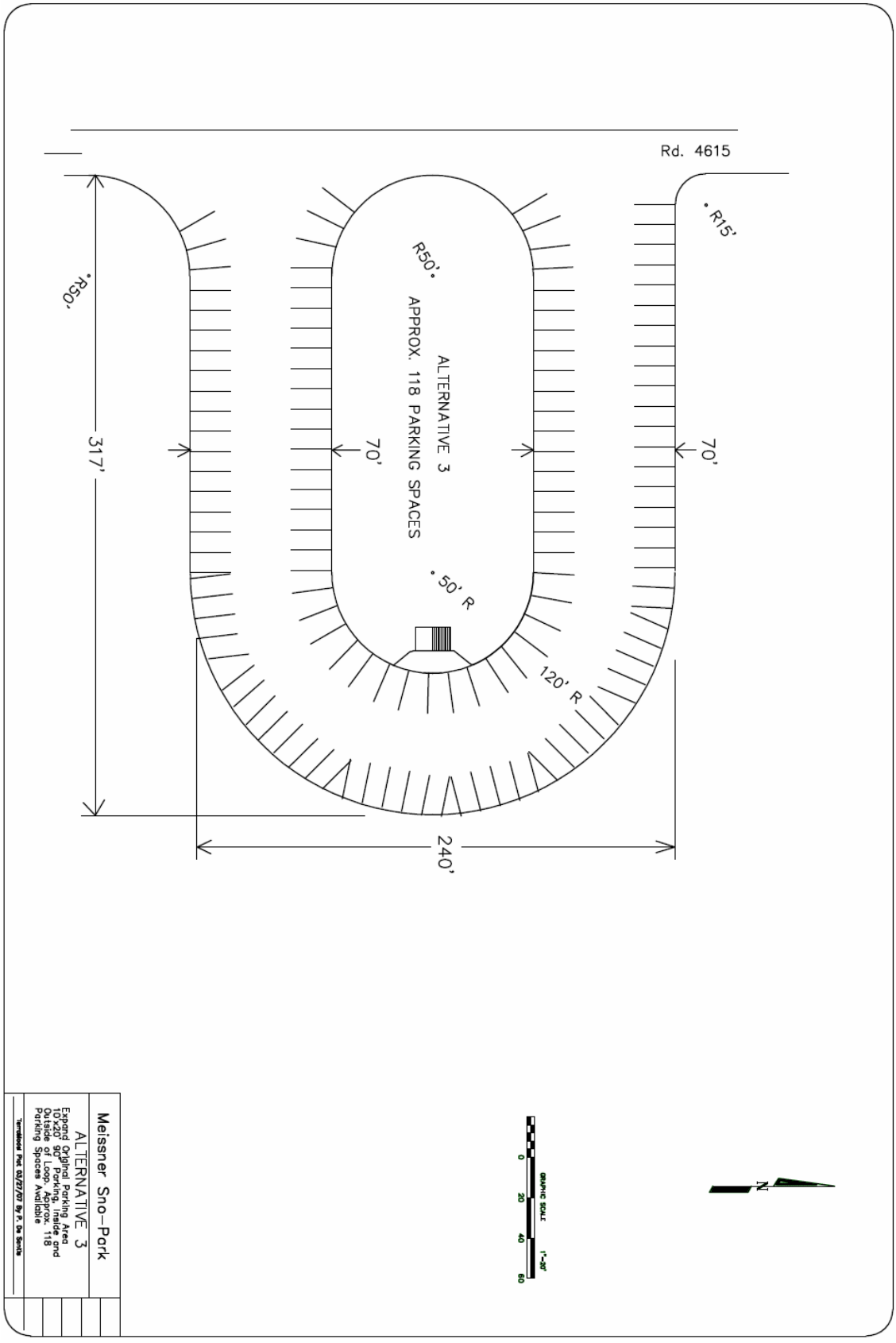


Figure 5: Alternative 3 Proposed Parking Area – 120 Parking Spaces



Actions Common to Alternative 2 (Proposed Action) and Alternative 3

Figure 6: Alternative 2 (Proposed Action) Proposed Parking and Staging Area with Proposed Trails 1 through 5

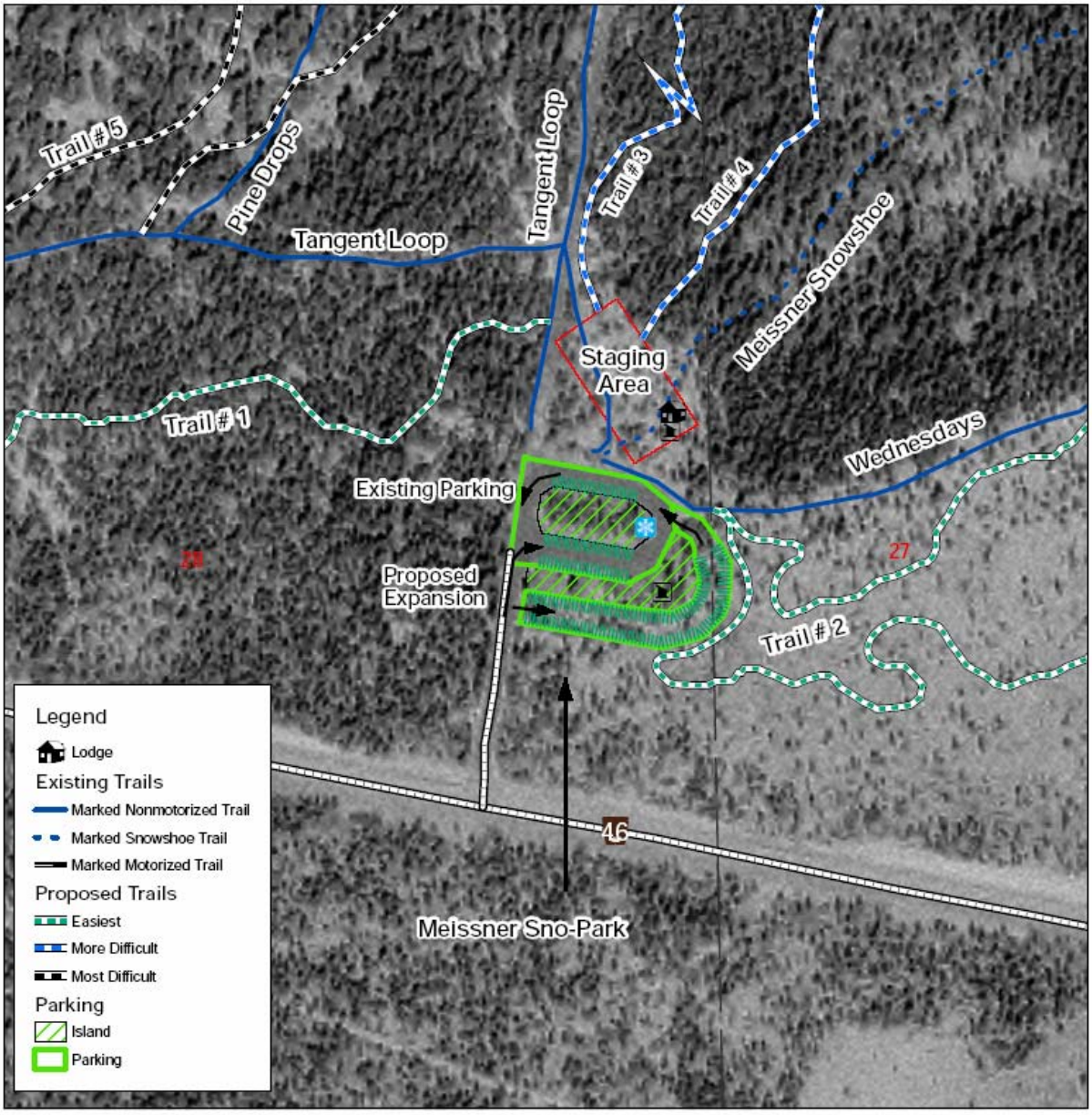
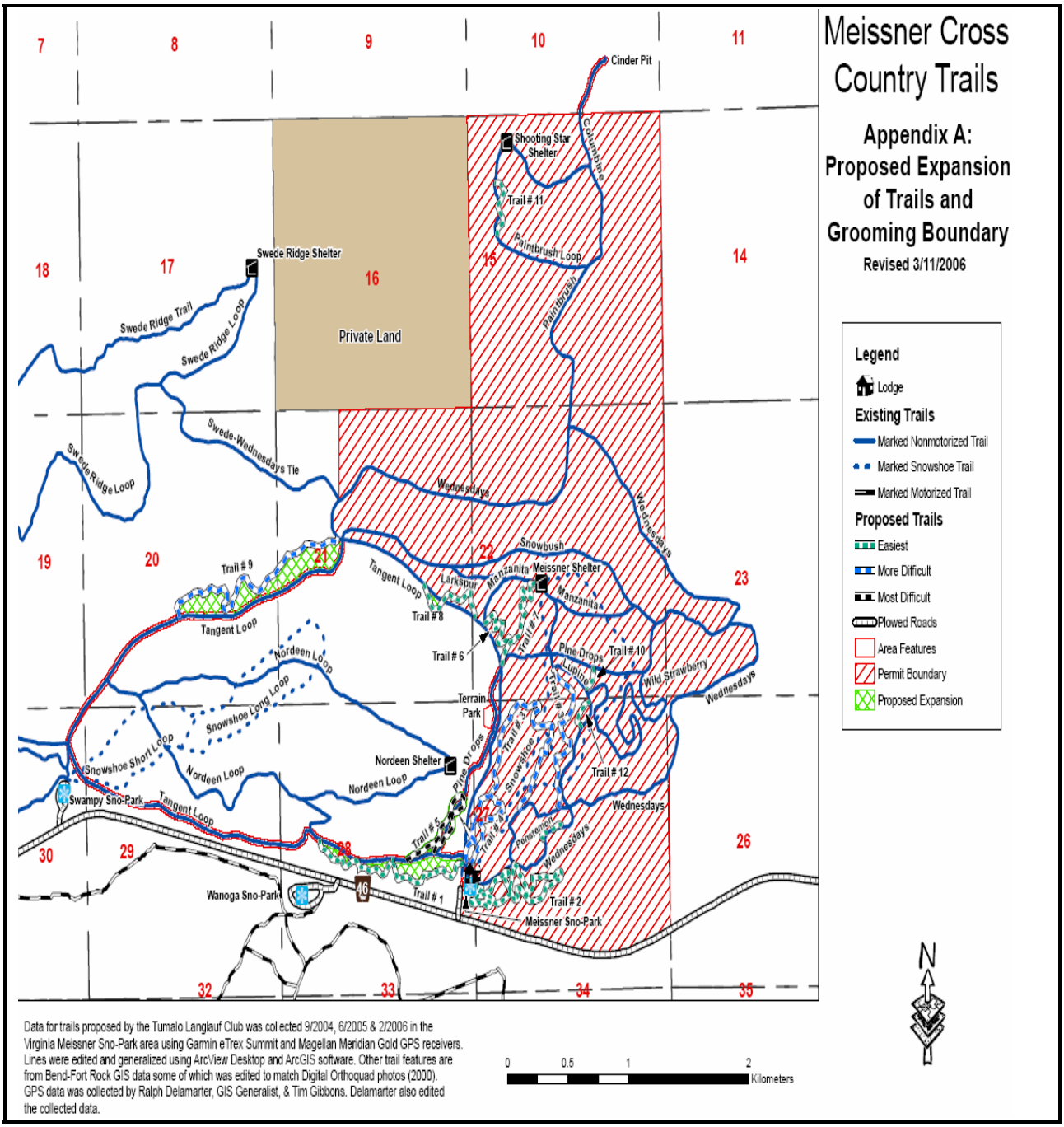


Figure 7 displays the proposed expanded trails and grooming boundary. Expansion of the grooming boundary would include Trail numbers 1 (Section 28) and 9 (Sections 20 and 21). Figure 7 has been elongated to provide easier reading for the reader, although the scale at the bottom is no longer accurate for vertical measurement.

Figure 7. Alternatives 2 and 3 Proposed Trail Development and Grooming Expansion -



Resource Protection Measures Common to All Alternatives

Alternatives are designed to be consistent with the desired condition specified in the LRMP and the standards and guidelines contained therein. Resource protection measures are an integral part of each of the action alternatives. The following would be applied to reduce potential adverse impacts of Alternative 2 (Proposed Action) and Alternative 3.

Water Protection

Any gas-powered or hydraulic equipment used in the construction of trails shall be refueled outside of streams and riparian areas. (Source: BMP T-21 Servicing and Refueling of Equipment)

Noxious Weed Prevention

Clean all equipment before entering *and after leaving* National Forest System lands. Remove mud, dirt, and plant parts from project equipment before moving it into the project area and before proceeding to the next project.

Prior to project initiation, visit the known weed sites and treat (most are small enough to be hand-pulled). At the same time, check the project area for any new weeds that may have entered it and treat any weeds found.

Recommendations for Weed Prevention/Education:

Incorporate noxious weed monitoring as part of the area for noxious weeds annually, if possible, after the project ends. If any noxious weeds are found they should be removed.

During the snow-free seasons, post noxious weed educational information at the site kiosk.

Wildlife

Project Design Criteria

PDC #1 – To assure that suitable NRF habitat is remaining vacant, or becomes occupied by a pair of northern spotted owls, maintenance monitoring for northern spotted owls would occur every three years, starting in the year 2010, within ¼ mile of any groomed trails. If spotted owls are discovered within any of these particular stands, grooming would be seasonally restricted beginning on March 1. Also, if owls are found in any stands immediately adjacent to lighted trails, these trail lights would also be seasonally restricted beginning on March 1. Maps would be provided to the project file of the NRF stands that this would pertain to.

PDC#2 – To reduce potential negative impacts to wildlife that utilize this area during the winter, lighting would need to be shield, canter, or cut lighting to reach only the areas needing to be illuminated at the lowest possible wattage and spectrum. Lighting would occur on ski trails that are on roads only. Lighting would not occur on more than the proposed furthest distance (6.2 miles), days of the week (up to 5 days a week), or hours per day (up to 4 hours per day). If at any time, these lights are found to have a negative impact to wildlife, even with these measures, the Forest Service would revisit this issue. Options include reducing the distance lighting can be used, reducing the number of days per week, reducing the number of hours per day the lights are used, or removing the light altogether.

PDC#3 – To aid in reducing the impacts of fragmentation from trail construction and to deter from potential motorized and bike use during the summer, all green trees and/or snags felled during trail construction up to 12” dbh or less would be felled onto the trail bed (whether it is a groomed trail or not). All trees greater than 12” dbh can be felled to the outside of the trail bed. Logs larger than this would also be moved on site to the outside of the trail bed. All current trails that are void of this material (groomed or not), must have it placed in areas where they intersect with system roads or other non-winter

trails for the complete sight distance, either by felling an occasional tree or bringing the material from another sight. These new or widened trails would also need to be signed as no motorized or bike use.

PDC#4 – To prevent disturbance and possible nest abandonment by northern goshawks, none of the proposed actions of either of the action alternatives would take place within ¼ mile of the active nest from March 1 – August 31. This includes trail construction, parking lot expansion, lodge construction, improvements to the pole barn, and staging area construction. Artificial trail lighting and trail grooming would also be prohibited starting March 1 on this section of trail (4615 Road). Maps would be provided in the project file highlighting where outside of this ¼ mile restriction that activities could occur. This site could be monitored to determine nesting status. If nesting activities are not observed by May 15, project activities within this ¼ mile restriction could proceed (WL-12).

PDC #5 - Any active raptor nest found during management activities would be protected from disturbing activities within ¼ mile (l mile for the use of explosives or activities associated with the rock breaker) of the nest by restricting site disturbing operations during the following periods:

Northern goshawk	*March1 – August 31 (WL-11)*
Cooper's hawk	*April 15 – August 31 (WL-19)*
Sharp-shinned hawk	*April 15 – August 31 (WL28)*
Red-tailed hawk	*March 1 – August 31 (WL-3)*
Golden Eagle	*January 1 – August 31 (WL-3)*
Osprey	*April 1 – August 32 (WL-3)*
Great gray owl	*March 1 – June 30 (WL-33)*

A Bend/Ft. Rock Wildlife Biologist should be notified as soon as possible to determine the species of raptor if unknown, and to make a determination of nesting status and which trail construction activities need to cease and which can continue.

PDC#6 - Surveys for great gray owls have not been conducted, but should occur in one particular area within the Meissner Project area. Surveys should begin in 2008 and run for two consecutive years. The 2008/2009 surveys would use the method outlined in Quintana-Coyer, et al. (2004) "Survey Protocol for Great Gray Owls within the Range of the Northern Spotted Owl." These surveys would be combined with surveys occurring within other project areas nearby. Trail construction on the North Tangent trail would be seasonally restricted from March 1 to June 30 (WL-33) and grooming of this same trail would not occur starting on March 1 of each year until the two year protocol is complete.

Mitigation Measures (Implementation Coordination)

MM#1– During trail construction, place the proposed routes on the landscape in a manner where the least amount of habitat would be impacted (i.e. more open areas on the ground). To help retain habitat for species that need larger trees, snags, or cwm habitat, avoid as much as possible cutting large trees and snags (>18" dbh) or cutting through large single snags (>18"dbh) or large piles of CWM (place trails on outer edges, not through the middle of them). Try to route trails around this type of habitat.

Recommendations

R #1 - To avoid potential nest abandonment, nest destruction, and loss of broods for woodpeckers, cavity nesters, and focal bird species, within or immediately adjacent to the project area, do not conduct trail construction activities (felling of trees and brushing out trails) during the period April 1 – August 15. Implement activities where possible during the fall, winter, and early spring (September through March). If the specified restriction period must be compromised, project activity at the beginning of the period (within the first month) would be considered. If these activities could be done during these time periods, impacts such as disturbance and abandonment of nests or even nest destruction would be reduced.

Soils

- Forest Service recreation management specialists should ultimately be involved with the final design specifications for the new and modified recreation facilities. Considerations include visual and environmental impacts as well as costs associated with construction and maintenance.
- Under Alternatives 2 and 3, include appropriate Best Management Practices as part of the project design. Apply appropriate erosion-control measures to all ground disturbing activities associated with the construction and development of new facilities, as described in General Water Quality Best Management Practices (Pacific Northwest Region, 1988).
- Provision should be made for surface drainage from new recreation facilities as well as safe passage of surface runoff from other developed sites. The amount of maintenance can be reduced if drainage structures are properly installed during new construction.
- Consider the need for revegetation measures following construction activities to accelerate the re-establishment of ground cover vegetation and minimize soil particle movement. This would include seeding with an appropriate erosion-control seed mixture recommended by a local specialist, and the application of mulch and fertilizer as necessary.
- LRMP standard and guideline SL-6 (page 4-70 and 4-71) provides ground cover objectives to minimize accelerated erosion rates on disturbed sites with unprotected soils. On disturbed sites that would not be paved or covered with surfacing materials, it is expected that management objectives would be met by achieving 30 to 45 percent effective ground cover within the first year after disturbance and 46 to 60 percent cover after two years.
- Effective ground cover includes all living or dead herbaceous or woody materials and rock fragments greater than three-forths of an inch in diameter in contact with the ground surface, including tree or shrub seedlings, grass, forbs, litter, and woody biomass.
- Monitor the implementation and effectiveness of erosion-control and other resource protection measures during and following construction activities. Prioritize where maintenance activities are needed and conduct regular preventative maintenance to minimize erosion damage on developed sites and in adjacent, runoff delivery areas.
- Due to presence of sensitive soils on slopes greater than 30 percent, consider the need for restricting mountain bikes and any other authorized recreation use to designated trail systems to minimize impacts to soils in adjacent areas.

Comparison of the Alternatives

Table 3 compares the alternatives in relation to the activities proposed in Alternative 1 (No Action), Alternative 2 (Proposed Action), and Alternative 3. Measurements are approximate.

Table 3: Comparison Of Alternatives

Proposed Activity	Alternative 1 Existing	Alternative 2	Alternative 3
Parking Lot Expansion	60	120 additional	60 additional
(No. of Parking Spaces)	60 total	180 total	120 total
Warming Shelter Size	0	2,748 ft.²	1,370 ft.²
Staging Area (Acres)	0	1	1
Trails – New (Miles)	0	9.7	7.8
Trails – Ungroomed (Miles)	9.3	0 additional	0.4 additional
Trails – Groomed (Miles)	12.8	9.1 additional	11 (3.2 miles on existing trails)
Trails – Lighting (Miles)	0	1.9 to 6.2	0
Expansion of Grooming Boundary to Include Additional Shelters	0	Trail #1 Trail #9	Trail #1 Trail #9
Terrain Park (Acres)	0	4.2 acres	4.2 acres
Double Vault Toilet	1	2	2
Informational Kiosk	Sign Board	Kiosk	Kiosk

CHAPTER 3 – ENVIRONMENTAL CONSEQUENCES

This section of the environmental assessment considers the environmental consequences of implementation of the various alternatives. The effects may be direct, indirect, or cumulative.

This EA incorporates the Specialist Reports in the Project Record (40 CFR 1502.21). These Specialist Reports contain the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation that the resource specialist relied upon to reach the conclusions in this EA.

Discussion of Effects – Key Issues

Key Issue #1 – Recreation Experience

The project area includes the trail system radiating from Virginia Meissner Snopark and is accessed by the Cascade Lakes Highway (CLH) on the Deschutes National Forest. This planning area is within 15 miles of Bend, Oregon. The area is comprised of gently rolling terrain with the intrusion of some steeper buttes. The terrain gains elevation to the west. Road 4615 is the main access off of CLH. Data collected from monitoring has indicated a forest-wide increase in use of 35% from 1982 through 1995 for dispersed type use. This equates to an increase of 35,000 Recreational Visitor Days (RVDs). Use has gone up on average in the developed campgrounds within the project area 44% in only a four-year period from 1995 through 1998. Facilities (such as parking areas like Meissner Snopark), and infrastructure at many developed sites are inadequate to meet today's needs and/or are in need of replacement or extensive repair.

Recreation use along all points of the CLH (and Scenic Byway) has been on the increase since the early-1980s, when Bend and Central Oregon became destination points for a variety of year-round outdoor pursuits. With abundant water, and the Cascade Mountains creating a spectacular backdrop, the Cascade Lakes area provides opportunities for camping (developed and dispersed), motorized and non-motorized boating, angling, and wildlife viewing during the summer and winter. These are only a handful of the more popular activities that thousands of people come to experience and enjoy every year.

More specifically, Meissner Snopark has always been a popular venue for Nordic skiing. In the last 5 years, there has been a marked increase in use there for two primary reasons; 1) the resurgence of snowshoe use and 2) the allowance of grooming of the Nordic trails for traditional and skate skiing. A series of snowshoe routes have been identified, inviting more snowshoe use. Also, the Tumalo Langlauf Club has been grooming with a full sized snowcat for skate skiing for two years. Meissner is the nearest snopark to Bend and the lowest elevation, creating the shortest season. Table 3, page 21 lists the current amount of trails and parking available.

Use at Meissner Snopark has increased by 100% from 1992 to 2000 in comparison to Swampy (located just to the west) where the use has only increased 40%. Since 2000 the snowshoe trail and skate ski grooming have been implemented. Currently, the parking lot is full all weekend and holidays and many weekdays.

Table 4. Seasonal Use at Meissner Snopark from 1992 to 2000.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
MEISSNER	4,054	2,371	4,536	5,982	3,431	4,511	5,584	9,036	8,273

Effects of the Alternatives

Alternative 1

This alternative would continue current management. Recreation opportunities would remain relatively unchanged in the short-term. The trend of increased recreation use would continue which could reduce recreation opportunities for many at Meissner and force people to go elsewhere. They wouldn't however be able to ski on groomed routes unless they go to Mount Bachelors pay trail system. Use would continue to grow affecting parking opportunities and creating parking congestion and wrecks. Parking illegally is common now and would increase, creating a significant law enforcement challenge. As a result of finding no place to park, people would be dissatisfied. The trails would continue to become overcrowded causing more conflicts and more people dissatisfied.

Alternative 2

The proposed action would provide for current and future use tripling the parking potential to 180 parking slots and increasing the amount of trail, as well as constructing a shelter, toilet, staging area and terrain park.

Parking lot size: The increase in parking would provide for current use on weekends as well as holidays. It is estimated that future use would continue to increase and ultimately would max out again within 10 years. This would provide for more satisfied people being able to find parking and more encounters on the ski/snowshoe trails.

Shelter: The shelter would be 2748 square feet in size and lodge style. It would be larger and more elaborate than any in the area. It would be used by skiers preparing to ski and snowshoe. The size would allow for large groups inside for social events or race events.

Lighting: Under Alt. 2, 4.3 miles (7 kilometers) of trail would be lit with low voltage lighting which faces down and lights the trail route. Lighting could affect the experience of some as opposed to natural lighting from the moon, or from using a headlamp. The trail lighting is designed to illuminate the route so that in the short day winter months, the day can be extended for more people, especially those at work or school. This would be a benefit for cross country ski teams especially.

Trails: 12.8 kilometers of new trail would be constructed under alternative 2. These trails or reroutes of existing trails would serve to provide better gradients on all trails while creating loop opportunities which lend themselves to enhancing race routes. The additional trails are mostly within 2 miles of the trailhead, adding to the dispersal of users within a timeframe in which most people ski. On average the ski time is around 2 hours, which relates to 4-6 miles. These new trails would help disperse that close in use. Other existing trails 23 km, would be widened for skate skiing grooming width. This would create the opportunity to groom a total of 35.8 km of trails for skating or traditional Nordic skiing. Increasing the trail system for some would be changing the character of the Meissner area. Some prefer to have non – groomed trails.

Common to all alts: The terrain park, staging area and toilet are the same for all action alternatives. The terrain park would provide for training in mild gradient skiing and practicing turns. The staging area

would be utilized for events and would be the same for all alternatives. The shelter would be located in/near the staging area. The toilet would be a double vault toilet and would be located near the shelter.

Alternative 3

Alternative 3 would modify the size of the snopark expansion, the trail system and the shelter and would not approve lighting of trails.

Parking lot size: The parking lot expansion would be limited to doubling the size to approximately 120 vehicles. This would be adequate for the current use and would likely fill up on a few holiday days each year. In the long term, the parking lot would accommodate future use for approximately 5-10 years. In limiting the expansion it would provide for current and future parking needs but would limit at some point and some times the overall use at one time. This would also limit the amount of congestion on the trail system with fewer encounters while skiing.

Shelter: The shelter would be about 1370 square feet in size and lodge style. The size is commensurate with others in the area. The size would allow for moderate sized groups inside for social events or race events. People would tend to get prepared outside more and/or spend less time inside if the shelter is crowded. The size of the parking area would be adequate for current and future use.

Lighting: Under Alt. 3 there would be no lighting of trails. The effects would be no different than present, where the moon light or headlamps light the way, creating a more primitive/natural experience.

Trails: 12.6 kilometers of new trail would be constructed under alternative 3. These trails or reroutes of existing trails would serve to provide better gradients on all trails while creating loop opportunities which lend themselves to enhancing race routes. The additional trails are mostly within 2 miles of the trailhead, adding to the dispersal of users within a timeframe in which most people ski. On average the ski time is around 2 hours, which relates to 4-6 miles. These new trails would help disperse that close in use. Other existing trails 23 km, would be widened for skate skiing grooming width. This would create the opportunity to groom a total of 35.8 km of trails for skating or traditional Nordic skiing. Increasing the trail system for some would be changing the character of the Meissner area. This alternative would provide a net increase of 0.4 miles of non-groomed trails which would be accessed within a mile of the parking lot. This would provide a more traditional experience for those who like it.

Common to all alts: The terrain park, staging area and toilet are the same for all action alternatives. The terrain park would provide for training in mild gradient skiing and practicing turns. The staging area would be utilized for events and would be the same for all alternatives. The shelter would be located in/near the staging area. The toilet would be a double vault toilet and would be located near the shelter.

Discussion of Effects – Analysis Issues

Wildlife

Discussion of the effects to wildlife is divided into the following sections: PETS Species, other rare and uncommon species, Management Indicator Species, Landbirds/Birds of Conservation Concern, and Special Habitat Features (Dead Wood, Coarse Woody Materials, and Late Seral and Old Growth Habitat).

Field Reviews and Analysis Methodology

Protocol Surveys to determine presence and nesting status were conducted for the northern spotted owl. Surveys for northern goshawk were conducted along proposed trails and at a historical nest site within the project area. Specific timing and methodology of the survey can be found under the species discussion.

Field reconnaissance was conducted in the spring-fall 2006 and 2007 for habitat suitability specific to the species listed in above and to those listed in Table 2.

Often during surveys for the species listed above, other species from Table 2 can be observed. Other sources of a species' documented presence come from local knowledge (birdwatchers, Oregon Department of Fish and Wildlife records, past District records, and casual observations from other field-going District personnel). It is noted in the discussion for the particular species where there is recent field verification of the presence of a species, or if historical records determined presence.

A project boundary was placed around the proposed trail system to help in the analysis process. This boundary includes the existing Meissner ski-trail system and the proposed grooming expansion boundary and proposed new trail system. This area is approximately 4,643 acres (see alternative maps).

In some cases, in the absence of scientifically rigorous species surveys to determine population numbers and exact locations for each of the 58 species considered in the BE and Wildlife Report that have known or potential habitat within the general area, habitat and habitat components, in conjunction with anecdotal individual sightings were used for the analysis with the assumption that if appropriate habitat is available for a species, then that species occupies or could occupy the habitat. In other words, in the absence of protocol and scientifically rigorous surveys for all 58 species, a species was presumed present unless proven absent. Examples of specific habitat components that could be analyzed include: snag/coarse woody material (CWM), habitat/green tree replacements (GTRs), late/old structural habitat (LOS). Population trends were determined by assessing how the alternatives impact the structure and function of the vegetation (i.e. habitat) relative to the current and historic habitat availability in conjunction with state conservation status information and ranking for the species in the Natureserve (2007) database (http://www.natureserve.org/explorer).

In addition to field reconnaissance information, current analysis tools, recent and best available science, and Geographical Information System databases provided additional information.

Some wildlife habitats required a more detailed analysis and discussion. Level of analysis depends on the existing habitat conditions (i.e. limited habitat availability versus widespread habitat availability), the magnitude and intensity of the effects of the proposed actions (i.e. would the proposed actions cause a loss, no change, or increase in habitat), the risk to the resources (sustainability and availability of the habitat), and the issues identified. These factors were used to form conclusions as to how the information in regards to the effects would be useful and relevant in the process of making an informed decision.

Methodology for Cumulative Effects including Bounding

For this report, potential cumulative effects were bounded by 6th field subwatersheds, of which two occur within the project area. To get a broader look at what possible cumulative effects are for species such as the northern spotted owl, not only were the subwatersheds that the project occur in reviewed (2), but the subwatersheds that two other recreation projects are to occur in (building additional trail and/or facilities) were also reviewed (Kapka Butte Snopark and the Mountain Bike Events Course). The area of impact for these projects covers an additional 3 subwatersheds. These 6th field subwatershed include Lava Island Falls, Benham Falls, Coyote Springs, Spring River, and Dutchman Creek (the project area includes two other additional subwatersheds, but the acreage included was low, and no new trails occurred within them, thus these two were not included within the analysis). This scale was chosen as the initial bound because it sets a logical boundary that is not too large (as a 5th field watershed) or too small (as the project boundary). Benham Falls, Coyote Springs, and Lava Island Falls subwatershed boundaries were clipped either at the Forest Service boundary or the Deschutes River because of the majority of the trails and recreation activities occur on the west side of the river and so the high percentage of private lands in these areas would not be included.

The cumulative effects are focusing on fragmentation from roads, trails, facilities, wildfires and timber sales (up to 40 years old and newer), and how the fragmentation could possibly be breaking up the landscape for species that need core undisturbed habitat for successful breeding. Fragmentation will be

discussed as a part of this project with current condition within the Specific Habitat Features Section and cumulative effects analysis within the listed subwatersheds for species that would be more affected by fragmentation (i.e. northern spotted owl and northern goshawk).

For bounding in time, generally 20 years is considered because it not only can represent multiple generations of a species, but also tree growth can alter the classification of habitat structure in this timeframe, and often, new management policies are in place.

For analysis of cumulative effects and other actions, the following present and reasonably foreseeable actions are considered: Any effects of past actions are indistinguishable from each other and combined have been considered as part of the existing condition and the suitability or quality of the habitat. All of these projects, with the exception of subsoiling, contribute to habitat loss.

Table 5. Ongoing and Reasonably Foreseeable Projects for Cumulative Effects Analysis

Project	Description	Potential Cumulative Effects
Ongoing Actions		
County roads Right of way maintenance	Grading, hazard tree removal and snow removal	Loss of individual trees and snags; disturbance, edge effects
East Tumbull, Klak,	Commercial Thinning, Pre-commercial thinning	Reduction of hiding cover; delayed recruitment of small diameter (<15") snags and logs; increase in recruitment of larger trees (eventually larger snags and logs), increased shrub cover; fragmentation and edge effects
Kapka, Klak	Whipfalling	Reduced hiding cover, and multi-storied stands, increase in recruitment of larger trees.
East Tumbull	Mowing/Burning to reduce fuel hazard	Reduced shrub habitat; reduced winter forage, loss of nests, increased retention of trees, snags, and logs in event of wildfire.
Kapka, Kit, Klak	Machine piling	Loss of logs and disturbance
Kapka, Kit, Klak	Subsoiling	Disturbance
Midstate Electric Powerline Maintenance	Hazard trees, pole changes, mowing, access roads already established	Loss of individual trees and snags, maintenance of open habitat, access to recreating public
Trail Maintenance (hiker, biker, cross-country skiing, snowmobile)	Hazard tree falling/removal	Loss of individual trees, snags, and logs. Winter trails become more open allowing for other uses to occur during non-snow months; disturbance throughout the year.
Mountain bike trails (Lair Downhill trails	biking trails	Human disturbance, fragmentation, edge effects
Hiking trails	miles of hiking trails	Human disturbance, fragmentation, edge effects
Edison OHV Trail System	miles of OHV trails	Human disturbance, fragmentation, edge effects
Edison Butte Sno-park, Swampy Lakes Sno-Park, Vista Butte Sno-park	miles of cross-country ski trails and snowshoe trails	Human disturbance, fragmentation, edge effects
Edison Sno-park, and Wanoga Sno-park	miles of snowmobile trails	Human disturbance, fragmentation, edge effects
Reasonably Foreseeable Actions		
Sparky	Hazard tree removal/felling	Loss of individual trees and snags, disturbance
Kapka Butte Snopark	Creation of a new snopark; 10 acres of habitat conversion	Loss of habitat (nesting/foraging), disturbance
Mountain Bike Events Course	Creation of 30 miles of trail	Loss of individual trees and snags, increase in

Project	Description	Potential Cumulative Effects
		human disturbance, and edge effects
NSA Connector Trails	Creation of 2 miles of new trail to connect COD, Lair, and Phil's Trailhead.	Loss of individual trees and snags; increase in human disturbance, and edge effects
Wanoga Downhill Mountain Bike Trail	Creation of 1 mile of downhill trails near the Wanoga Sno-play hill	Loss of individual trees and snags, increased human disturbance, and edge effects

Proposed, Endangered, Threatened, and Sensitive Species

A Biological Evaluation was prepared for this project in accordance with Forest Service Manual 2600. It addresses effects to federally proposed or listed candidate, threatened, or endangered species and Forest Service Sensitive Species. One federally listed species thought to occur presently or historically on the Deschutes National Forest and analyzed in this document is the northern spotted owl (*Strix occidentalis*). The Oregon Spotted Frog is a federal candidate for ESA listing that is also on the Region 6 Regional Forester's Sensitive Species list.

Table 6 displays those species that are currently federally listed and whether the species has been documented to occur within the Meissner project area. Table 7 summarizes the determinations for federally listed species.

Table 6. Federally Listed Wildlife Species

Species	Status	Habitat	Presence
Canada lynx	Federal Threatened	Subalpine fir with lodgepole pine	No habitat within or adjacent to the proposed project area.
Northern Spotted Owl	Federal Threatened, MIS	Old growth mixed conifer forests	Documented in the watershed; dispersal habitat and nesting, roosting, foraging (NRF) habitat in the general project area; proposed trails are adjacent to NRF habitat.
Oregon Spotted Frog	Federal Candidate, Regional Forester Sensitive	Streams, marshes	No habitat within or adjacent to the proposed project area.

Table 7. Summary of Conclusions for Federally Listed Species

Species	Alt. 1 – No Action	Alt. 2 – Proposed Action	Alt. 3
Canada Lynx	NE	NE	NE
Northern Spotted Owl	NE	NLAA	NLAA
Oregon Spotted Frog	NE	NE	NE

Canada Lynx

Federally Threatened

The Forest Wildlife Biologists for the Deschutes and Ochoco National Forests and the Crooked River National Grassland have made a determination based on the best available science, that no Canada lynx habitat or self-maintaining populations are present on these three administrative units (Jeffries and Zalunardo 2003). The authors of the letter relied upon the Lynx Biology Team's definitions of habitat and definitions that are part of the Lynx Conservation Assessment and Strategy. The US Fish and Wildlife Service was an integral part of both the Biology Team and the Conservation Assessment and Strategy. Due to lack of habitat, any actions or no action within the proposed treatment areas would have

"No Effect" to this species or its habitat. The full letter documenting the rationale can be found in Appendix A of the Wildlife Report.

Northern Spotted Owl

Federally Threatened, Management Indicator Species

Habitat Needs and Existing Condition – Nesting, Roosting, Foraging (NRF) Habitat

According to the 2006-2009 Programmatic Biological Assessment (BA), suitable nesting habitat on the Deschutes National Forest includes stands of mixed conifer, ponderosa pine with white fir understories, and mountain hemlock with subalpine fir, all exclusive to a narrow forested band below the high-elevation subalpine forests and above the low-elevation lodgepole pine/ponderosa pine forests. Suitable habitat is naturally fragmented by intrusions of lava and other forest types. It is not found in large patches but as inclusions of other stands.

Edge effects from large forest openings may adversely impact the microhabitat conditions necessary for suitable owl habitat as well as contribute to increasing the risk to spotted owls imposed by predators or to competition from the barred owl (Strix varia) (USDA 2006).

Suitable nest sites are generally in cavities in the boles of either dead or live trees. Platform nests may also be used (but more rarely), which include abandoned raptor nests, broken treetops, mistletoe brooms, and squirrel nests. Relatively heavy canopy habitat with a semi-open understory is essential for effective hunting and movement (USDA 2006).

Habitat conditions that support good populations of northern flying squirrels (Glaucomys sabrinus), western red-backed voles (Clethrionomys californicus), and other nocturnal or crepuscular small mammals, birds, and insects are essential to supporting spotted owls (USDA 2006).

Within the approximate project area, there are several different nesting, roosting, and foraging (NRF) polygons that proposed trails occur within or adjacent to (see Figure 3 in Appendix C). Total acreage of NRF habitat within the project area is 374 acres. These stands were verified as suitable to marginally suitable habitat for northern spotted owls. The marginally suitable stands lack continuity in the canopy and an open understory. According to the NRF map, the stands surveyed are not part of larger contiguous blocks of habitat. These larger blocks of contiguous habitat can be found to the northwest of the proposed project within a roadless area (Bend Municipal Watershed).

R6 Protocol surveys for spotted owls were conducted in 2006 and 2007 within verified suitable to marginally suitable habitat, and within ¼ mile of the proposed project boundary. There were no responses from spotted owls during these surveys. Historically, there have been vocalizations heard from Nordeen Shelter (within the project area, 0.5 miles NW of the Meissner Sno-Park) during the winter (2001 and 2003) and approximately 0.5 miles north of the project area from the 4601-430 Road (2005). Spotted owl use is still possible within the project area, and, areas where vocalizations were heard may be used for winter foraging.

The project does not occur within a Late Successional Reserve (LSR) or a Critical Habitat Unit (CHU). The closest LSR is approximately 3 miles southwest (Sheridan) and the closest CHU is approximately 12 miles southwest of the project area.

The following table displays existing trails that travel through NRF habitat within the project area.

Table 8. Trail Mileage that Occur Within or Adjacent to NRF Within the Meissner Project Area.

Trail Type	On the Road (mi.)	Cross-Country (mi.)	Total (mi.)
Big Cat Groomed	0.77	0.03	0.8
Ungroomed Ski	0.03	0.05	0.08
Snowshoe		0.04	0.04
Bike		0.38	0.38

Total	0.8	0.5	1.3

Trails on roads are those that occur on existing system roads. Trails that occur cross-country are not on system roads, but on trails that travel across the landscape. Big Cat Groomed trails are those that utilize the large trail groomer and need a larger area (18 feet at a minimum) to operate.

Habitat Needs and Existing Condition – Dispersal Habitat

Dispersal habitat is important for the movement of spotted owl young away from natal areas or adults moving from one territory to another. Spotted owl dispersal habitat can also act de facto as corridors or movement habitat for a variety of other wildlife species that utilize mature forests. Using the 2006-2009 BA definition for dispersal habitat (a minimum of 30% canopy closure regardless of plant association, and a minimum average diameter of 7" dbh for lodgepole pine stands, and 11" dbh for mountain hemlock, ponderosa pine and mixed conifer stands), the 2004 Satellite Imagery Layer was queried with these definitions. The 7-11" dbh size class used for defining dispersal habitat was equivalent to the Pole (5-9" dbh) and Small tree (9-15"dbh) categories. Approximately 3,080 acres of dispersal habitat occur within the proposed Meissner Project area (66% of the project area). Of the total dispersal acres, 1,863 acres (60%) is of mixed conifer, and 1,216 acres (40%) is of lodgepole pine.

The following table displays the existing trails that travel through dispersal habitat within the project area.

Table 9. Trail Miles that Occur Within or Adjacent to Dispersal Habitat Within the Meissner Project Area.

Trail Type	On the Road (mi.)	Cross-Country (mi.)	Total (mi.)
Big Cat Groomed Ski	6.71		6.71
Snowmobile Groomed Ski	0.41	1.14	1.55
Ungroomed Ski	2.66	3.38	6.04
Snowshoe		5.17	5.17
Bike		3.21	3.21
Total	9.78	12.9	22.68

As explained for Table 7, trails on roads are those that occur on existing system roads. Trails that occur cross-country are not on system roads, but on trails that travel across the landscape. Big Cat Groomed trails are those that utilize the large trail groomer and need a larger area (18 feet at a minimum) to operate, and snowmobile groomed trails are those groomed by a snowmobile pulling a small grooming machine. These trails are smaller than the big cat groomed trails, but larger than an ungroomed ski trail to accommodate snowmobiles. They are approximately 6-10 feet wide.

Direct, Indirect, and Cumulative Effects

Alternative 1 - Since there is no proposed action under this alternative there are no effects to spotted owls, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative effects. Trails would continue to exist within the NRF habitat and dispersal habitat as they currently do, with grooming trails remaining as they currently do.

Due to continued human use of the area, owls may not be able to use the habitat as they may have historically. It is unknown where the exact locations of the owls heard from Nordeen Shelter were, but most likely were heard from NRF stands that occur adjacent to the 4615 Road. Maintenance surveys should be conducted to assure whether or not these stands are remaining vacant, or become occupied by a single or a pair of northern spotted owls (Ch. 2, PDC#1).

Alternative 2 – Action Alternative 2 would add an additional 0.85 miles of big cat groomed ski trail (utilizing the big grooming machine on wider trails, as opposed to using a snowmobile for narrower trails) on roads to the system and 0.78 miles of big cat groomed ski trail that would occur cross-country, both within NRF habitat (see Figure 4 in Appendix C of the Wildlife Report). It would also add 0.24 miles of

big cat groomed ski trail to roads and 3.96 miles of big cat groomed ski trail cross-country within dispersal habitat. Table 9 summarizes these new trails with the existing condition.

Table 10. Trail Miles that Occur Within or Adjacent to NRF and Dispersal Habitat Within the Meissner Project Area with the Addition of Alternative 2 (in parentheses).

Trail Type	On the Road w/ Dispersal(mi.)	On the Road w/ NRF (mi.)	Cross-Country w/Dispersal(mi.)	Cross-Country w/NRF (mi.)	Total (mi.)
Big Cat Groomed Ski	6.71 + (0.24)	0.77 + (0.85)	(3.96)	0.03 + (0.78)	13.34
Snowmobile Groomed Ski	0.41		1.14		1.55
Ungroomed Ski	2.66	0.03	3.38	0.05	6.12
Snowshoe			5.17	0.04	5.21
Bike			3.21	0.38	3.59
Total	10.02	1.65	16.86	1.28	29.81

A 0.78-mile trail would remove approximately 1.7 acres of NRF habitat, including larger trees, logs, and snags (0.4% of the total NRF habitat within the project area) (Ch. 2, MM#1). Although habitat loss is minor, edge effects would impact approximately 38 acres (10% of the total NRF habitat within the project area) (placing a buffer of 200 feet on each side of the trail as the area of edge effect – see the section on Fragmentation). This trail would fragment the stand, increasing the edge effects that already occur from roads and forest treatments adjacent to the stand, reducing its effectiveness as possible interior habitat for the northern spotted owl and other forest interior species (PDC#3).

This alternative would also remove 8.64 acres of dispersal habitat (0.3% of the total acres of dispersal habitat within the project area). With buffers placed on the trails, edge effects that may occur from the trail would impact approximately 192 acres (6% of the total acres of dispersal habitat within the project area) of dispersal habitat. This loss is not expected to reduce an owl's ability to move through the area. Small openings in forest habitat do not hinder dispersal of northern spotted owls (Forsman et. al 2002 p.22).

The terrain park, parking lot expansion, staging area, and lodge construction would not be removing NRF habitat or dispersal habitat, but occur adjacent to stands of NRF habitat. These improvements/expansions would function as a source of increased disturbance by inviting expanded and increased use of the sno-park because of the following: the expected use at the sno-park could potentially triple by expanding the size of the parking area three times its current size; folks may spend more time in the project area with construction of the lodge; and, cross-country ski racing is expected to occur here, which would draw large crowds and the publicity that comes with the races.

Of the total 6.2 miles of lighting that may occur, 1¼ miles of trail are proposed for lighting through NRF habitat. Artificial lighting may reduce habitat suitability by impacting the owl's ability to hunt, avoid predators, mate or maintain their internal rhythms (Nelson 2004). It can reduce the suitable area of foraging habitat for owls and other night hunting birds (PDC#2). Artificially lighting the trails at night would also draw more people to use the area at night, which would prolong the amount of daily disturbance.

Many miles of trail within the project area have been snowmobile groomed for approximately 12 years, while big cat grooming has only occurred for the past couple of years (personal communication with Marv Lang, USFS). Some of these groomed trails are adjacent to or within ¼ mile of NRF habitat. Past actions that have created the fragmented landscape, such as forest treatments, roads, trails, and winter activities such as grooming trails, may have all contributed to the habitat not currently being occupied, as well as the overall lack of connectivity to larger tracts of NRF. Expanding grooming and increased use by recreationists in the winter (and perhaps year round) may continue to make this habitat unusable.

Due to continued human use of the area, owls may not be able to use the habitat as they may have historically. It is unknown where the exact locations of the owls that have been heard from Nordeen Shelter were, but most likely were heard from NRF stands that occur adjacent to the 4615 Road. Maintenance surveys should be conducted to assure whether or not these stands are remaining vacant, or become occupied by a single or a pair of northern spotted owls (PDC#1).

In June 2007, a Level 1 meeting/field trip occurred with Lauri Turner, DNF Forest Biologist and Jennifer O'Reilly, USFWS Biologist, to review this project and to look at the project in the field. Their concerns were similar. Although the habitat is not currently occupied, the proposed trail through NRF habitat and the proximity of groomed trails to NRF habitat affects the quality of the habitat.

Alternative 2 "May Effect, but is Not Likely To Adversely Affect" the northern spotted owl and their habitat. NRF habitat, including larger trees, logs, and snags would be removed along 0.78 miles of trail. This alternative also increases fragmentation of the habitat and creates additional and expanded avenues of disturbance with new trails, expanding groomed trails onto additional roads and other trails, and adds artificial night lighting. It is unlikely suitable habitat would be occupied due to the lack of connectivity between large suitable habitat patches, marginal habitat quality, and the level of disturbance currently existing. The fact remains that they have utilized them for some function, whether for dispersing, foraging, or as winter roost. These remaining patches of NRF habitat are valuable to afford this species with islands of habitat to move through, or to stay temporarily, or longer**.**

This alternative does not meet NSO PDC D.4 of the 2006-2009 Joint Aquatic and Terrestrial Programmatic Biological Assessment (BA) and is not covered by the scope of this document. If this alternative is chosen, a project-specific BA must be prepared and submitted for informal or formal consultation with the U.S. Fish and Wildlife Service.

This alternative would add incrementally to ongoing and reasonably foreseeable actions, cumulatively affecting NRF habitat and potentially the northern spotted owl from increasing fragmentation by increasing trails and human presence across the landscape. These effects are within this project area and the subwatersheds this project occurs in and those associated with the fragmentation analysis (see Figures 6 and 7 in Appendix B of the Wildlife Report).

Most NRF stands that occur in these subwatersheds are not part of larger contiguous blocks. Forest treatments, roads, and trails have fragmented much of the NRF habitat in these areas. Use surrounding these stands is becoming year round by winter use and summer use. It is unknown at what point NRF stands cannot be occupied because of human impacts. This project would cumulatively add effects by degrading available habitat by the consistent road and recreation use occurring adjacent to these smaller patches of NRF habitat. The total number of trails just within the project area within NRF and dispersal habitat and those within the surrounding subwatersheds is just a small look of what occurs across the landscape. They may not be usable as the center of a home range, but in an island of unsuitable habitat, these areas become islands of importance for owls and other species that depend on this type of suitable habitat such as the northern goshawk.

Alternative 3 – Action Alternative 3 would add an additional 0.09 miles of big cat groomed ski trail on roads to the system within NRF habitat. No new big cat groomed ski trails would go cross-country through NRF. Trail placement has been moved outside of suitable habitat and follows the outer edge of the stand (see Figure 5 in Appendix C of the Wildlife Report). It would also add 0.15 miles of big cat groomed ski trail to roads; 3.92 miles of big cat groomed ski trail cross-country, and 0.33 miles of ungroomed ski trail within dispersal habitat. Table 11 summarizes these new trails with the existing condition.

Table 11. Trail Miles that Occur Within or Adjacent to NRF and Dispersal Habitat Within the Meissner Project Area with the Addition of Alternative 3 (in parentheses).

Trail Type	On the Road wi/ Dispersal(mi.)	On the Road wi/ NRF (mi.)	Cross-Country wi/Dispersal(mi.)	Cross-Country wi/NRF (mi.)	Total (mi.)
Big Cat Groomed Ski	6.71 + (0.15)	0.77 + (0.09)	(3.92)	0.03	11.67
Snowmobile Groomed Ski	0.41		1.14		1.55
Ungroomed Ski	2.66	0.03	3.38 + (0.33)	0.05	6.45
Snowshoe			5.17	0.04	5.21
Bike			3.21	0.38	3.59
Total	9.93	0.89	17.15	0.50	28.47

Alternative 3 would not remove any suitable northern spotted owl habitat. Alternative 3 may contribute to edge effects to suitable habitat directly adjacent to proposed trails (see Figure 5 in Appendix C), but would not fragment habitat as Alternative 2 would.

This alternative would remove a total of 9.3 acres of dispersal habitat (0.3 % of the total acres of dispersal habitat within the project area) along 4.25 miles of trail. With buffers placed on trails, the edge effects that could occur from the trail would impact approximately 206 acres (7% of the total acres of dispersal habitat within the project area) of dispersal habitat. This loss is not expected to reduce an owl's ability to move through the area. Small openings in forest habitat do not hinder dispersal of northern spotted owls (Forsman et at 2002 p.22). The total acreage is fairly low, but it does create fragmentation within the landscape across a broad area, which can change the microclimate adjacent to these trails (see the Fragmentation discussion).

Other affects from activities such as the terrain park, lodge, staging area, and grooming would be similar as in Alternative 2. The parking lot would be doubled in size with this alternative instead of tripled as in Alternative 2. Thus, it is expected that use would potentially double instead of triple.

Artificial night lighting is not proposed with this alternative, so impacts associated with this activity would not occur.

Many miles of trail within the project area have been snowmobile groomed for approximately 12 years, while big cat grooming has only occurred for the past couple of years (personal communication with Marv Lang, USFS). Some of these groomed trails are adjacent to or within ¼ mile of NRF habitat. Past actions that have created the fragmented landscape, such as forest treatments, roads, trails, and winter activities such as grooming trails, may have all contributed to the habitat not currently being occupied, as well as the overall lack of connectivity to larger tracts of NRF. Expanding grooming and increased use by recreationists in the winter (and perhaps year round) may continue to make this habitat unusable.

Due to continued human use of the area, owls may not be able to use the habitat as they may have historically. It is unknown where the exact locations of the owls heard from Nordeen Shelter were, but most likely were heard from NRF stands that occur adjacent to the 4615 Road. Maintenance surveys should be conducted to assure whether or not these stands are remaining vacant, or become occupied by a single or a pair of northern spotted owls (see Section III, PDC#1).

In June 2007, a Level 1 meeting/field trip occurred with Lauri Turner, DNF Forest Biologist and Jennifer O'Reilly, USFWS Biologist, to review this project and to look at the project in the field. Their concerns were similar. Although the habitat is not currently occupied, the proposed groomed trail adjacent to NRF habitat and the proximity of groomed trails to NRF habitat affects the quality of the habitat.

Alternative 3 "May Effect, but is Not Likely to Adversely Affect" the northern spotted owl and its. Many current and proposed groomed trails are within close proximity of NRF habitat. Disturbance from grooming and increased and expanded use of humans in the area habitat could affect potential northern spotted owl breeding, feeding, and shelter. It is unlikely suitable habitat would be occupied due to the

lack of connectivity between large suitable habitat patches, marginal habitat quality, and the level of disturbance currently existing. The fact remains they have utilized them for some function, whether for dispersing, foraging, or as winter roost. These remaining patches of NRF habitat are valuable to afford this species with islands of habitat to move through, or to stay temporarily, or longer.

This alternative meets applicable NSO PDCs of the 2006-2009 Joint Aquatic and Terrestrial Programmatic Biological Assessment (BA) and is covered by the scope of this document. If this alternative is chosen, a BE, along with the necessary Compliance Checklist and Project Monitoring Form would be submitted to the Level 1 team member for packaging and submission to the USFWS. No further consultation with the USFWS is necessary.

Cumulative effects are the same as those for Alternative 2.

Oregon Spotted Frog

Federal Candidate, Regional Forester Sensitive

The Oregon spotted frog inhabits the margins of lakes, marshes, and pools in streams where there is an abundant growth of vegetation (Csuti et al. 2001). There is no standing water, streams (intermittent or perennial), or riparian areas near the proposed project area. A lack of habitat assumes a lack of presence and therefore any actions or no action within the proposed project area would have "No Effect" to the species and therefore not contribute to a trend towards federal listing for this species.

Regional Forester's Sensitive Species

Species classified as sensitive are considered in the Biological Evaluation to determine potential effects of all programs and activities on these species. After a review of existing records, habitat requirements, and existing habitat components, it was determined that the sensitive species in the following table have habitat present or are known to occur in the project area and will be included in this analysis.

Table 12. Deschutes National Forest Sensitive Species Summary. These species are addressed further in this section.

Species	Status	Habitat	Presence
Pacific fisher	Federal Candidate, Regional Forester Sensitive	Mixed conifer forest, complex forest structure	Unconfirmed reporting near the general project area. Potential habitat within the project area.
California wolverine	Regional Forester Sensitive	Mixed conifer habitat, high elevation	Potential habitat for dispersing wolverine and foraging habitat.

Table 13. Sensitive Species for which no habitat exists within project area. These species will not be considered further because no habitat exists within the project area. Refer to the Wildlife Report for rationale regarding habitat availability and suitability.

Species	Status	Habitat	Presence
Northern Bald Eagle	Regional Sensitive, MIS	Lakeside or riverside with large trees	No habitat within or adjacent to the proposed project area.
Crater Lake Tightcoil	Regional Forester Sensitive, Survey & Manage	Wet vegetation zone	Potential habitat occurs adjacent to the proposed project area, but would not be impacted by the project.
Bufflehead	Regional Forester Sensitive, MIS	Lakes, snags	No habitat within or adjacent to the proposed project area.
Harlequin Duck	Regional Forester Sensitive, MIS	Rapid streams, large trees	No habitat within or adjacent to the proposed project area.
Horned grebe	Regional Forester Sensitive, MIS	Lakes	No habitat within or adjacent to the proposed project area.

Red-necked grebe	Regional Forester Sensitive, MIS	Lakes	No habitat within or adjacent to the proposed project area.
Tricolored blackbird	Regional Forester Sensitive, BCC	Lakeside, bullrush	No habitat within or adjacent to the proposed project area.
Yellow rail	Regional Forester Sensitive, BCC	Marsh	No habitat within or adjacent to the proposed project area.
Greater sage grouse	Regional Forester Sensitive, BCC	Sagebrush flats	No habitat within or adjacent to the proposed project area.
American peregrine falcon	Regional Forester Sensitive, BCC	Riparian, cliffs	No habitat within or adjacent to the proposed project area.
Gray Flycatcher	Regional Forester Sensitive	Arid woodlands and shrublands	No habitat within or adjacent to the proposed project area.
Pygmy rabbit	Regional Forester Sensitive	Sagebrush flats	No habitat within or adjacent to the proposed project area.

Pacific Fisher

Federal Candidate, R6 Sensitive

Habitat Needs and Existing Condition

The Pacific fisher primarily uses mature, closed-canopy coniferous forests with some deciduous component, frequently along riparian corridors (Csuti et al. 2001). In Ruggiero, et. al. (1994), it is suggested that fishers prefer closed-canopy (>60% canopy closure), late-successional forests with large physical structures (live trees, snags, and logs), especially if associated with riparian areas. A 2004 Species Assessment by the US Fish and Wildlife Service document that key aspects of fisher habitat are those also associated with late-successional forests (i.e. high canopy closure, large trees and snags, large logs, hardwoods, and multiple canopy layers). However, distribution of fishers is limited by elevation and snow depth (Krohn et al 1997 in US Fish and Wildlife Service Species Assessment). Fishers generally avoid areas of high human disturbance either through road density or recreational developments. Fishers are fairly large, weighing 3-13 lbs and 29-47 inches long (combined male and female ranges: males are generally larger than females). This may suggest a need of larger log sizes for dens than other animals with similar needs (e.g. marten). Aubry and Raley (2006) found that in southwestern Oregon, fishers were found denning and resting in areas of at least 4,000 ft elevation, >80% canopy closure, > 16 snags 20"+ dbh/acre and >67 logs >20" diameter per acre; supporting the suggestion that this species utilizes large to very large structure. Denning and resting sites were also observed in large live trees (mostly Douglas-fir) with mistletoe brooms, limb clumping, rodent nests, or some other deformity. They also found that fishers were preying upon woodpeckers, jays, grouse, quail, squirrels, hare, porcupine, and skunks. Most of these prey species can be found within the project area.

Fishers have not been documented within the project area. Although rare, they have been documented in the Three Sisters area, near Mt. Bachelor, Elk and Hosmer Lakes, and west of little Cultus Lake (Deibert et al 1970s). More recently (2003) an unconfirmed sighting of a fisher was reported in the Bridge Creek drainage, approximately 1.5 miles northwest of the project area.

Potential habitat does exist within the project area. Based on habitat descriptions in the literature, the majority of this type of habitat would exist in the same habitat suitable for the northern spotted owl (374 acres). Many of these stands contain white fir that is dead or decadent with these same species making up the log component. This would most likely be utilized as resting habitat and not denning habitat. Fishers generally have large territories, usually several hundred square kilometers (Csuti et al 2001), thus this area could also be used for foraging.

The project area includes many roads and recreation that reduces the quality of the habitat for fisher. It is possible that it could be utilized as part of a larger home range.

Direct, Indirect, and Cumulative Effects

Alternative 1 – Since there is no proposed action under this alternative there are no impacts to fishers, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 – It is possible that fisher could currently occupy the potential suitable habitat within the project area. Alternative 2 would construct 0.78 miles of groomed ski trail (see Figure 4, NRF habitat in Appendix C) within potential fisher habitat, possibly removing/modifying key habitat constituents for fisher and fragmenting this piece of habitat (see Section III, MM#1).

The terrain park, parking lot expansion, staging area, and lodge construction would not be removing potential fisher habitat, but occur adjacent to stands of NRF habitat. These improvements/expansions would function as a source of increased disturbance by inviting expanded and increased use of the sno-park because of the following: the expected use at the sno-park could potentially triple by expanding the size of the parking area three times its current size; folks may spend more time in the project area with construction of the lodge; and, cross-country ski racing is expected to occur here, which would draw large crowds and the publicity that comes with the races.

The project area itself would become less likely to support fishers because of the increased fragmentation of the area from additional groomed ski trails, widespread grooming during the winter, and increased recreational use during the winter. With the creation of winter trails comes the possibility of use of these trails during spring, summer, and fall. This would result in the project area, especially around the 4615 road, experiencing year round pressure from the density of roads and trails, and would also open up areas to new and expanded disturbances, making this area highly used by humans year round (Ch. 2, PDC#3).

Artificial night lighting could impact this species by confusing their natural patterns, deterring them from established foraging areas, and affecting their breeding cycles, basically modifying their behavior (Saleh 2007, IDA 2002, Campaign for Dark skies). This lighting is proposed adjacent and/or through 1 ¼ miles of potential fisher habitat (Ch. 2, PDC#2).

This alternative "may impact" fishers and their habitat within the project area. It is highly unlikely, but possible, that fisher would use the area for denning purposes; it is highly probable it is used as a larger home range for resting and foraging habitat. Fisher habitat occurs elsewhere, but with more and more trails being added across the landscape broadening the area of year round access to recreationist, it makes it critical to maintain what habitat is available. This project proposes numerous amounts of groomed trails in the vicinity of the sno-park, packing a huge density of trails into a small area, plus expanding trails into adjacent areas. This fragmentation of the landscape and increased disturbance by recreationists reduces the project area as suitable for this species. Since this species has a Natureserve Ranking of "imperiled" it is important to maintain as much habitat connectivity as possible.

The additional trails and human presence in the project area would increase the fragmentation that currently exists. This alternative may impact individuals and habitat, but would not likely contribute to a trend towards Federal listing.

Alternative 3 – – Impacts from Alternative 3 would be less than the impacts from Alternative 2. Trail construction would not occur through potential fisher habitat artificial night lighting would also not occur, and the parking lot would be doubled in size, not tripled.

All other impacts (with the exception of impacts of trail construction through potential fisher habitat and the use of artificial lighting) would be similar to those in Alternative 2.

This alternative "may impact" fishers and their habitat within the project area. Although the trail would be moved out of potential fisher habitat, it would follow the edge for a distance, possibly removing large snags and logs that occur at the fringes of this habitat, which could still be used by fisher (Ch. 2, MM#1). It is highly unlikely, but possible, that fisher would use the area for denning purposes; it is highly probable it is used as a larger home range for resting and foraging habitat. Fisher habitat occurs elsewhere, but with more and more trails being added across the landscape broadening the area of year round access to recreationists, it makes it critical to maintain what habitat is available. This project

proposes numerous amounts of groomed trails in the vicinity of the sno-park, packing a huge density of trails into a small area, plus expanding trails into adjacent areas. This fragmentation of the landscape and increased disturbance by recreationists reduces the project area as suitable for this species. Since this species has a Natureserve Ranking of "imperiled" it is important to maintain as much habitat connectivity as possible.

California Wolverine
Region 6 Sensitive

Habitat Needs and Existing Condition

The wolverine is the largest member of the weasel family (weasels, martens and fishers), and is known to be a solitary and wide-ranging species. They tend to be found in alpine or boreal coniferous forests with a large home range of 73-1,000 sq km (avg. 422 sq. km. or 104,000 acres). Wolverines are known to avoid areas of high human population or road densities. Wilderness and roadless areas are key to maintaining wolverine habitat. Wolverines utilize downed logs and rock crevices or talus for denning. Prey is no a limiting factor for wolverines because they are opportunistic carnivores that also eat a variety of berries and roots (Natureserve 2007).

Populations in the Cascade Mountains are believed to be small and scattered. Wolverine habitat in Oregon lies within the Hudsonian life zone at elevations from 6,000 feet to above timberline. Dominant tree species are white bark pine, mountain hemlock, and subalpine fir (Ingram 1973). In winter, wolverine will move lower in elevation into mixed conifer and lodgepole pine habitats within the Canadian Life Zone described by Bailey. Wolverine habitat is probably best defined in terms of adequate year-round food supplies in large, sparsely inhabited wilderness areas. Preference for forest type is also related to abundance of prey species, and also to avoidance of high temperatures and of humans (USDA 1994). Wolverines tend to rely on cover provided by mature and intermediate timber, and tend to avoid openings such as those caused by fires and clearcuts (Hornocker and Hash, 1981; Banci 1994). Although openings are generally avoided, the wolverine will frequent open areas above timberline (Ingram 1973).

Home ranges may encompass 10 to 80 square miles. This variation may be related to differences in the abundance and distribution of food. Although large carrion is a key element in the wolverine diet, the diet requires scavenging and hunting smaller prey. A prey base diverse in size and in species is important because large carrion is not always available (USDA 1994). The wolverine has an extremely sensitive nose and can locate carrion under three feet of snow (Ingram 1973).

Den sites are usually located in rocky crevices or on the ground under a snow bank (Ingram 1973). Dens can also be found under tree roots, protruding rocks, in caves, or in burrows within overhanging banks.

The essential component of wolverine habitat may be isolation and the total absence of disturbance by humans. The greatest impact on the potential of the land to support wolverine in the Pacific Northwest Mountains is forestry, settlement, and access (USDA 1994).

The Meissner Project Area potentially provides lower elevation winter foraging habitat for wolverine. However, increased human use during the winter may affect the suitability and availability of habitat in the area for this species. The best habitat for this species closest to the project area is to the northwest in the Bend Municipal Watershed. Although this area still receives a high degree of recreation use due to the presence of trails (hiking, biking and cross country skiing and some snowmobile trails), there is relatively less human disturbance than in the Meissner project area which includes a high degree of trails and year round recreation, and also has a high density of roads. This species could be found as a transient in the area, but denning habitat does not occur.

Diebert et al (1970s) recorded wolverine observations in the area of Three-Fingered Jack (1965), Broken Top (1969), Many Lakes Basin (1972), and Willamette Pass (1973). More recently, wolverine tracks were found in the Deschutes Bridge area, during winter track surveys by the Oregon Dept. Fish and

Wildlife (ODFW 2007). The closest confirmed wolverine sighting was 6 miles northwest of the project area near Broken Top (1969).

Direct, Indirect, and Cumulative Effects

Alternative 1 – Since there is no proposed action under this alternative there are no impacts to wolverine, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 – The project area most likely only provides lower elevation foraging habitat and dispersal habitat. The action alternatives would increase the density of winter trails in addition to the roads within the project area. The vegetation removal for these trails would fragment the landscape, but, could not be a barrier to wolverine. While this width and trail construction is not considered a barrier, artificial lighting (in Alternative 2) and human activity and disturbance are, which mikes it highly unlikely that this species would continue to use the area after the project is completed.

This project would add incrementally to ongoing and reasonably foreseeable actions, cumulatively impacting this species by human activity and disturbance by construction of new trails across the project area. Use of this and the surrounding areas is expected to increase year round as all forms of recreation on the Forest become popular and with the population of Bend continuing to grow. In the future, new trail construction in the higher elevations and with continued growth of numbers of people entering the backcountry may increase fragmentation of movement for wolverine, decreasing potential dispersal opportunities for this species, that is considered "critically imperiled" by Natureserve (2007). This project may impact individuals, but would not negatively impact populations or contribute towards a trend to federal listing.

Management Indicator Species

During the preparation of the Deschutes LRMP, several wildlife species were identified as management indicator species (MIS). These species were selected because their condition could be used as an indicator of the condition of other species dependent upon similar habitat. Indicator species can be used to assess the effects of management actions on a wide range of other wildlife with similar habitat requirements. The species listed in Table 13 were selected for the Deschutes National Forest and for which there is potential habitat in the project area. Other MIS species were previously discussed in the Threatened or Sensitive sections are northern bald eagle, northern spotted owl, bufflehead, harlequin duck, horned grebe, red-necked grebe, tricolored blackbird.

Table 14. Deschutes National Forest Management Indicator Species which are addressed further in this document.

Species	Status	Habitat	Presence
Great gray owl	MIS	Mature and old growth forests associated with openings and meadows	Potential habitat adjacent to the proposed project area.
Northern goshawk	MIS	Mature and old-growth forests; especially high canopy closure and large trees	Documentation in the general project area. Suitable habitat within the proposed project area.
Cooper's hawk	MIS	Similar to goshawk, can also use mature forests with high canopy closure/tree density	Potential habitat within the proposed project area.
Sharp-shinned hawk	MIS	Similar to goshawk in addition to young, dense, even-aged stands	Potential habitat within the proposed project area.
Red-tailed hawk	MIS	Large snags, open country interspersed with forests	Potential habitat within the proposed project area.
Elk	MIS	Mixed habitats	Habitat and sightings occur within the proposed project area.
Mule deer	MIS	Mixed habitats	Habitat and sightings occur within the proposed project area.

Species	Status	Habitat	Presence
American marten	MIS	Mixed conifer or high elevation late-successional forests with abundant down woody material	Potential habitat occurs within the proposed project area.
Snags and Downed Wood associated species and habitat	Habitat for MIS	Snags and down woody material	Habitat occurs within the proposed project area.
Woodpecker Species			
Williamson's sapsucker	MIS, Landbird Focal species, BCC	Mature or old growth conifer forests with open canopy cover; weak excavator	Potential habitat occurs within the proposed project area.
Hairy woodpecker	MIS	Mixed conifer and ponderosa pine forests	Habitat and sightings occur within the proposed project area.
White-headed woodpecker	MIS, Landbird focal species, BCC	Mature ponderosa pine forests; weak excavator	Potential habitat occurs within the proposed project area.
Three-toed woodpecker	MIS	High elevation and lodgepole pine forests	Potential habitat occurs within the proposed project area.
Black-backed woodpecker	MIS, Landbird focal species	Lodgepole pine forests, burned forests	Potential habitat occurs within the proposed project area.
Northern flicker	MIS	Variety of forest types but more associated with forest edges	Habitat and sightings occur within the proposed project area.
Pileated woodpecker	MIS	Mature to old-growth mixed conifer forests	Habitat and sightings occur within the proposed project area.

Table 15. Management Indicator Species for which no habitat exists within the project area. These species will not be considered further because no habitat exists within the project area. Refer to the Wildlife Report for rationale regarding habitat availability and suitability.

Great blue heron	MIS	Riparian edge habitats including lakes, streams, marshes and estuaries	No habitat within or adjacent to the proposed project area.
Golden eagle	MIS, BCC	Large open areas with cliffs and rock outcrops	No habitat within or adjacent to the proposed project area.
Osprey	MIS	Large snags associated with fish bearing water bodies	No habitat within or adjacent to the proposed project area.
Western big-eared bat	MIS	Caves and old dwellings	No habitat within or adjacent to the proposed project area.
All Waterfowl Species	MIS	See Wildlife Report for specifics	No habitat within or adjacent to the proposed project area.
Lewis' woodpecker	MIS, Landbird focal species, BCC	Ponderosa pine forests, burned forests	No habitat within or adjacent to the proposed project area.
Red-naped sapsucker	MIS	Riparian hardwood forests	No habitat within or adjacent to the proposed project area.
Downy woodpecker	MIS	Riparian hardwood forest	No habitat within or adjacent to the proposed project area.

Great Gray Owl

Management Indicator Species, Rare and Uncommon

Habitat Needs and Existing Condition

Great gray owl nest stands vary in stand type from mixed stands of ponderosa pine and lodgepole pine to mixed conifer. Within these stands, for optimum nesting habitat canopy cover ranges from 50-70%. Nest stands are generally associated with open forest containing canopy closure that ranges from 11-59% dominated with grasses, open grassy habitat, including bogs, selective and clear-cut logged areas, and

natural meadows (Bull and Henjum 1990). The Deschutes LRMP defines this owl's habitat as being: lodgepole pine dominated overstory, overstory tree density of 67 trees per acre for trees greater than 12 inches diameter at breast height, canopy cover of 60% (50-70%), and distance to nearest meadow 440 (63-1,070ft.) feet (LRMP WL-31). The NWFP states that "the great gray owl, within the range of the northern spotted owl, is most common in lodgepole pine forests adjacent to meadows. However, it is also found in other coniferous forest types. Specific mitigation measures for the great gray owl, within the range of the northern spotted owl, include the following: provide a no-harvest buffer of 300 ft. around meadows and natural openings and establish ¼ mile protection zones around known nest sites." (page C-21). Great gray owls have a home range size of approximately 1,000-2,000 acres (Natureserve, 2007).

Potential habitat does exist within the Meissner project area. Potential habitat for great gray owls was identified using the 2004 protocol (e.g. > 45% canopy closure, average tree diameter >16" and within 200m of a meadow). Surveys have not been conducted to date. There are no historical sightings within the project area.

Direct, Indirect, and Cumulative Effects

Alternative 1 – There is no proposed action under this alternative, so there are no impacts to great gray owls, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 – There are two meadow areas within the Meissner project area that are potential foraging habitat for great gray owls. One of the meadows occurs within ¼ mile of the proposed North Tangent Loop Trail. The trail south of this proposed trail is currently groomed during the winter (4615 – 080 Road). Construction of the North Tangent Loop, and grooming of this and the Tangent Loop Trail may impact great gray owls because they are within ¼ mile of the meadow. If owls are nesting in the forested stands surrounding this meadow, they could be impacted by trail construction activities and noise from grooming if these occur during the breeding season (Ch. 2, PDC #6).

Of the maximum 6.2 miles of lighting that could occur, approximately 1 mile of trail that are proposed for lighting travel adjacent to potential great gray owl habitat. If great gray owls are nesting in this area, this lighting in natural areas could impact the owl's ability to hunt, avoid predators, mate or maintain their internal rhythms (Nelson 2004). It can also reduce the suitable area of feeding habitat for owls and other night hunting birds (Ch.2, PDC #2).

Of the two action alternatives, Alternative 2 would have more potential impacts from lighting the ski trails. The implementation of these alternatives may impact individuals, but would not contribute to negative cumulative impacts to this species or cause a trend towards federal listing.

Northern Goshawk

Management Indicator Species

Habitat Needs and Existing Condition

In Oregon, goshawks tend to select mature or old-growth stands of conifers for nesting, typically those having a multi-layered canopy with vegetation extending from a few meters above ground to more than 40 meters high. Generally nesting sites are chosen that are near a source of water and are on moderate slope, usually having a northerly aspect. This habitat type is quite similar to that used by the Cooper's hawk, but the trees tend to be older and taller and have a better-developed understory of coniferous vegetation (Reynolds et al. 1982). Foraging generally occurs within these mature stands where small openings occur. These birds generally forage on passerines (e.g. songbirds), but often utilize small mammals such as rodents as well as the occasional snowshoe hare. Some gallinaceous bird species are also preyed upon such as blue and ruffed grouse. Species and abundance of gallinaceous prey varies in the range of the goshawk depending on elevation and latitude.

Similar to the Pacific Fisher, within the project area, goshawks would tend to utilize habitat considered NRF habitat for the northern spotted owl (374 acres).

Surveys for goshawks were conducted in 2006 and 2007 within areas of suitable habitat that the proposed ski trails would be traveling through. A nest site that was discovered in 1997 during field reconnaissance for the Katalo West Timber Sale was found to be active in 2006 and 2007. The trail does not go through this stand, but is within ¼ mile of the nest site.

Direct, Indirect, and Cumulative Effects

Alternative 1 – Since there is no proposed action under this alternative there are no impacts to goshawks, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternative 2 – This alternative would construct a groomed ski trail through a core nest stand for a northern goshawk pair. This pair has been active in this stand since it was discovered in 1997. Placing this trail in this stand may cause impacts similar to those of a road (see Fragmentation discussion).

Most northern goshawks stay within their territory year round, migrating to lower elevations mainly to find prey. The activities that occur with this alternative, including creation of groomed ski trails, grooming trails, and lighting of the trails "may impact" this pair of goshawks that have been in this stand for at least 10 years. Any of the proposed project activities that occur within ¼ mile of the nest would be seasonally restricted to prevent disturbance and possible nest failure to this species that is ranked "vulnerable" by Natureserve (2007). This would include artificial night lighting and grooming periods (Ch. 2, PDC#4).

Similar to the northern spotted owl, this bird is also a forest interior dependent species, and this alternative would negatively impact the northern goshawk by fragmenting the habitat this bird species depends on.

This alternative would add incrementally to ongoing and reasonably foreseeable actions, cumulatively impacting this species by fragmenting available core habitat, and increasing human activity and disturbance by construction of new trails across the project area. Human use of this and the surrounding areas are expected to increase year round as all forms of recreation on the Forest become popular and with the population of Bend continuing to grow. This alternative may impact individuals, but would not negatively impact populations or contribute towards a trend to federal listing.

Alternative 3 – Alternative 3 removes the actions that would have the most impact to the northern goshawk. It does not include the trail through the stand the hawk is nesting in, and does not include the artificial lighting that could potentially disrupt reproductive patterns and cause the birds to move and avoid the area.

Although the above activities would not occur within this alternative, this alternative would still increase human use of this area and increase grooming on trails adjacent to the nest stand. These activities "may impact" this pair of northern goshawks and possibly cause them to abandon their nest stand.

The proposed project activities that occur within ¼ mile would still be seasonally restricted as in Alternative 2.

This alternative would add incrementally to ongoing and reasonably foreseeable actions, cumulatively impacting this species by increasing human activity and disturbance by construction of new trails adjacent to suitable habitat across the project area. Use of this and the surrounding areas are expected to increase year round as all forms of recreation on the Forest become popular and with the population of Bend continuing to grow. Continuing to add new trails of all forms in the surrounding landscape within or adjacent to suitable habitat, adds to and expands disturbance issues on the northern goshawk (Ch. 2, R#2). This alternative may impact individuals, but would not negatively impact populations or contribute towards a trend to federal listing.

Cooper's Hawk and Sharp-shinned Hawk
Management Indicator Species

Habitat Needs and Existing Condition

The Cooper's hawk prefers coniferous, mixed and deciduous forests, as well as riparian, juniper, and oak woodlands. Vegetative profile around nests are trees 30-60 and 50-70 years old in northwest and eastern Oregon, respectively with tree density of 265/ac. and 469/ac. Coopers hawks commonly nest in deformed trees infected with mistletoe (Marshall et al. 2003).

Sharp-shinned hawks, in Oregon, breed in a variety of forest types that have a wide range of tree species, though conifers dominate most. Nests have been located at elevations that range from roughly 300 to 6000 feet. Vegetative characteristics found at nest sites, include high tree density and high canopy cover, which produce cool, shady conditions. Nest stands preferred by sharp-shinned hawks are younger than those preferred by Coopers' and goshawk, usually 25-50 yr old, even-aged stands. In eastern Oregon all nest sites found by Reynolds et al. (1982) were in even-aged stand of white fir, Douglas-fir, ponderosa pine, or aspen, with ground vegetation limited to grasses and creeping barberry (Marshall et al. 2003).

There are no known Cooper's hawk or sharp-shinned hawk nests within or adjacent to the proposed ski trails. Surveys for goshawks, often can disclose Cooper's and sharp-shinned hawk territories, but no responses were heard during the surveys.

Direct, Indirect, and Cumulative Effects

Alternative 1 – Since there is no proposed action under this alternative there are no impacts to Cooper's or sharp-shinned hawks, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 – This project is not expected to have an impact on Cooper's or sharp-shinned hawks. Habitat is limited in the project area for these birds. During project implementation, if an active Cooper's hawk or sharp-shinned hawk pair and/or nest is discovered, project activities may be seasonally restricted (Ch. 2, PDC #5). The implementation of this project is not expected to contribute to negative cumulative impacts to either of these species or cause a trend towards federal listing.

Red-tailed Hawk
Management Indicator Species

Habitat Needs and Existing Condition

Red-tailed hawks have an extremely wide tolerance for habitat variation. Red-tailed hawks are largely perch hunters. Habitat types that provide suitable perches (trees, utility poles, outcrops, etc.) and are open enough to permit the detection of ground-dwelling prey, will typically support Red-tailed Hawks. Red-tails frequent woodland, agricultural land, clearcuts, grasslands, sagebrush plains, alpine environments, and urban areas. They construct nests in a variety of situations including tree, utility poles cliffs, and place there nests higher than other broad-winged hawks (Marshal et al. 2003).

There are no known red-tailed hawk nest sites within the project area.

Direct, Indirect, and Cumulative Effects

Alternative 1 – There is no proposed action under this alternative, so there are no impacts to red-tailed hawks. Without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 –Nesting habitat for these hawks may be lost by the action alternatives if potential nest trees are felled during trail construction (MM #1). During project implementation, if an active red-tailed hawk pair and/or nest is discovered, project activities may be seasonally restricted (PDC #5).

This project may potentially impact red-tailed hawk habitat, although this habitat is not considered limited within or adjacent to the project area. A majority of the area is forested, contains mature trees for perching, and openings that provide prey habitat. The implementation of this project would not contribute to negative cumulative impacts to this species or cause a trend towards federal listing.

Elk and Mule Deer

Management Indicator Species

Habitat Needs and Existing Condition

There are no Key Elk Areas (KEA), within the project area. Elk are transient in this area during the summer and fall as elk move between the Ryan Ranch KEA, Kiwa Butte KEA, and the Tumalo Mountain KEA.

The project area is summer range for mule deer. They are often seen during this time in the area. Because of their ability to use a variety of habitats, mule deer habitat is not seen as limited.

A majority of the project area is within Lava Island Falls subwatershed, which according to GIS, the road density is at 4.2 miles per square mile (mi/mi²) of road. The Benham Falls subwatershed is at 4.1 mi/mi². This analysis includes system and non-system roads (those that are user-created or are not considered a system road), so is not meant to address Forest Plan guidelines for open road density. Additionally, these numbers do not take into account those roads authorized for closure from the Katalo and Katalo West EAs and the East Tumbell EA. It is uncertain when these closures would occur.

Direct, Indirect, and Cumulative Effects

Alternative 1 – There are no impacts to elk or mule deer because there is no proposed action under this alternative, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no direct, indirect, or cumulative impacts.

Alternatives 2 and 3 – Direct impacts to deer and elk are not expected to occur from any of the action alternatives. This project is a winter use project. Deer and elk are not within the project area during the time of year when grooming and skiing would occur because of the snow depth. Trail construction may occur during the late spring, summer or fall when deer or elk may be present, but would generally avoid the areas of trail construction for the duration of the project.

The creation of groomed ski trails opens up other avenues of travel for humans during the summer months. There are several miles of non-system roads within the project area that are user-created, or occur on groomed ski trails (downed wood has been removed from these). These trails and user-created roads have a similar impact to big game as do system roads. From action Alternative 2, 0.28 mi/mi² would be added and from action Alternative 3, 0.34 mi/mi² would be added to the Lava Island Falls subwatershed, increasing system and non-system road density to 4.5 mi/mi² with both alternatives. With both action alternatives, 0.09 mi/mi² would be added to the Benham Falls subwatershed, increasing road density to 4.2 mi/mi². PDC#3 (see Chapter 2) includes steps to deter summer use of these trails and avoid the indirect effects they may cause from increased human presence during the summer months.

The implementation of this project would add incrementally to the ongoing or reasonably foreseeable actions, contributing to cumulative impacts. Trails do have an impact to deer and elk. This project is providing additional avenues for human disturbance within the watershed in conjunction with the current road system. With the implementation of this activity and other trail activities within the affected subwatersheds, human disturbance is becoming more prevalent and occurring year round. This project

does occur within summer range, which disturbance during this time is less critical than when it occurs during the winter months when animals are under stress from reduced forage and cold weather conditions.

American Marten

Management Indicator Species

Habitat Needs and Existing Condition

American martens occupy a narrow range of habitat types, living in or near coniferous forest. More specifically, they associate closely with late-successional stands of mesic (moist or wet) conifers, especially those with complex physical structure near the ground (Buskirk and Powell 1994). The information synopsis in Natureserve (2007) states that fallen logs and debris are special habitat features, and that an average territory size is approximately 10 sq. km (4 sq. mi or 2,560 acres) with densities as high as 1-2 per sq. kilometer (approx. 250-500ac) in the fall. Complex physical structure addresses important life needs. It provides protection from predators, access to the subnivean (below snow) space where most prey are captured in winter, and provides protective thermal microenvironments (Buskirk and Powell 1994). In the western U.S. in winter, most prey is captured beneath the snow surface. In these areas, structure near the ground is important in providing access to subnivean spaces (Corn and Raphael 1992). Desirable forest types of the marten are large, somewhat dense, stands of lodgepole pine, mixed conifer, and mountain hemlock. Abundant coarse woody material in these stands is important to support a rodent prey base (LRMP WL-61). It has been determined that marten tend to use forest cover with at least 40% canopy closure and upwards of 70-80% canopy closure (Spencer et al 1983 and Jones 1990).

Old Growth Management Areas (OGMA) were designated under the original LRMP within the lodgepole pine associations with marten being one of the target species for such a designation. Although there are no designated OGMAs, the habitat classified as NRF has many of the habitat constituents that marten would use. This is approximately 374 acres.

There are no known sightings within the Meissner project area, but it expected that with suitable habitat, they may be present.

Direct, Indirect, and Cumulative Effects

Alternative 1 – There are no impacts to marten because there is no proposed action under this alternative, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 – It is possible that marten could currently occupy the potential suitable habitat within the project area. Alternative 2 would construct 0.78 miles of groomed ski trail within potential marten habitat, possibly removing/modifying key habitat constituents for marten and fragmenting this piece of habitat (Ch. 2, MM#1).

The project area itself would become less apt to support marten because of the increased fragmentation of the area from additional groomed ski trails, widespread grooming during the winter, and increased recreational use during the winter. With the creation of winter trails comes the possibility of use of these trails during spring, summer, and fall, which would make the project area, especially around the 4615 road, have year round human pressure from the density of roads and trails, and would also open up areas to new and expanded disturbances (Ch. 2, PDC#3).

Artificial night lighting could impact this species by confusing their natural patterns, deterring them from established foraging areas, and affecting their breeding cycles, basically modifying their behavior (Saleh 2007, IDA 2002, Campaign for Dark skies). This lighting is proposed adjacent and/or through 1 ¼ miles of potential marten habitat (Ch. 2, PDC#2).

The trails would introduce more human use and disturbance, which on a project scale, could negatively impact marten habitat and marten use of the area. This alternative “may impact” marten and their habitat within the project area. Marten habitat occurs elsewhere within the project area and surrounding

subwatersheds, but as trails are added across the landscape, broadening the area of year round access to recreationists, the available habitat becomes more important. This project proposes new groomed trails in the vicinity of the sno-park, increasing the density of trails in a relatively small area, and expands trails across the project area (see the Fragmentation section for road and trail density within the Meissner Project area). This fragmentation of the landscape and increased disturbance by recreationists reduces the project area's suitability for this species. This species is considered vulnerable in Oregon.

This project would add incrementally to ongoing and reasonably foreseeable actions, cumulatively impacting this species by increasing fragmentation by increasing trails and human presence across the landscape. This alternative may impact individuals and habitat, but would not likely contribute to a trend towards Federal listing.

Alternative 3 – Impacts from Alternative 3 would be less than the impacts from Alternative 2. Trail construction would not occur through potential marten habitat and artificial night lighting would also not occur.

Although the trail would be moved out of potential habitat, it would follow the edge for a distance, possibly removing large snags and logs that occur at the fringes of this habitat, which could still be used by marten (Ch. 2, MM#1).

All other impacts (with the exception of impacts of trail construction through potential marten habitat and the use of artificial lighting) would be similar to those in Alternative 2.

MIS Woodpecker Species

Williamson's Sapsucker
Management Indicator Species, Landbird Focal Species, Bird of Conservation Concern

Habitat Needs and Existing Condition

Williamson's sapsuckers are a focal species for large snags in mixed conifer habitat. They will often utilize ponderosa pine habitat, specifically dead and live trees for foraging and select for large (>20" dbh) snags for nesting (Bull et al 1986).

In the proposed project area, the Williamson's sapsucker would use the dominant ponderosa pine stands.

Hairy Woodpecker
Management Indicator Species

Habitat Needs and Existing Condition

Bull et al (1986) reported hairy woodpeckers using both lodgepole and ponderosa pine and mixed conifer habitats and a variety of snags sizes. This species would be in mature stands and utilize (i.e. nest and forage) snags greater than 10 inches in diameter. Hairy woodpeckers may forage along the edges of existing timber sale units.

This woodpecker has been seen often within the project area in a variety of habitats.

White-headed woodpecker
Management Indicator Species, Landbird Focal Species, Bird of Conservation Concern

Habitat Needs and Existing Condition

White-headed woodpeckers utilize both live and dead ponderosa pines. They will forage on both live and dead pines often selecting the large diameter pines because they have more seeds and make more suitable nesting habitat. Having large ponderosa pine does not assure this species' presence. Indications have been made that a well-developed understory of trees and shrubs may encourage mammalian predation on nests (Marshall 1997). White-headed woodpeckers are absent from early seral ponderosa pine stands.

These woodpeckers are poor excavators and generally select for a more moderately decayed or softer snag in which to nest (Dixon 1995).

Habitat for white-headed woodpeckers is limited within the project area due to the lack of climax ponderosa pine associations. There are large ponderosa pines (live and dead) in the project area so potential habitat is present.

Three-toed Woodpecker
Management Indicator Species

Habitat Needs and Existing Condition

Three-toed woodpeckers use higher elevation (greater than 4,500 feet) habitats of mature lodgepole pine stands or stands with a lodgepole component (Goggans et al 1988; Bull et al 1986). The three-toed woodpecker is often associated with the black-backed woodpecker. Both species utilize smaller diameter snags for foraging and nesting. One way this woodpecker competes with other woodpecker species, specifically the black-backed woodpecker, is by utilizing higher elevation habitat (Bull et al 1986). When using Goggans et al (1988) to compare this species habitat with the black-backed woodpecker, it appears that the three-toed woodpecker does not generally occupy a wide range of habitat conditions. Therefore, areas considered as marginal black-backed woodpecker habitat, would not likely be three-toed woodpecker habitat.

A majority of the project area is above 4,500 feet in elevation. The project area and adjacent areas have a mountain pine beetle epidemic moving through, so lodgepole pine snags are currently becoming more abundant across the project area and surrounding adjacent landscape. Similar to the black-backed woodpecker, this species may only be limited by the number of standing snags.

Black-backed Woodpecker
Management Indicator Species, Landbird Focal Species, Bird of Conservation Concern

Habitat Needs and Existing Condition

According to Goggans (1988) and Bull et al (1986), the black-backed woodpecker uses mature ponderosa pine and lodgepole pine habitat types at relatively low elevations (less than 4500 feet), but can be found at higher elevations. Altman (2000) designates black-backed woodpeckers as a focal species for old-growth lodgepole pine. The black-backed woodpecker will use smaller snags for nesting as well as foraging. Bull et al (1986) suggested that this use of smaller diameter snags for nesting is a way of competing with other woodpecker species in the same habitat (e.g. white-headed woodpecker, northern flickers, etc.).

The project area contains little habitat less than 4,500 feet, but is it expected that the black-backed woodpecker would also be found here, especially if there is a mountain pine beetle epidemic providing an abundance of food and nesting habitat. Similar to the three-toed woodpecker, this species may only be limited by the number of standing snags, although this species has been observed utilizing other species of snags than just lodgepole pine.

Northern Flicker
Management Indicator Species

Habitat Needs and Existing Condition

Northern flickers are perhaps the most common woodpecker resident in Oregon. They can be found in a range of terrestrial habitat but are generally abundant in open forests and forest edges adjacent to open country (Marshall et al 2003). Being a large cavity nester (12.5” long according to Sibley 2005); they require large snags or large trees with decay in order to build their nests.

Northern flickers have been observed within the project area adjacent to the proposed trails. Potential habitat for this species is considered any plant association with large trees.

Pileated Woodpecker
Management Indicator Species

Habitat Needs and Existing Condition

The pileated woodpecker is associated with forest habitats that have large trees, especially snags, for nesting and foraging. It is most common in old-growth ponderosa pine/mixed conifer forests in eastern Oregon (Csuti et al. 2001).

Although there is a lack of observations of the actual bird, there are observations of tell-tale, pileated foraging revealing their presence within the project area and within proximity to proposed trails.

The pileated woodpecker would most likely utilize habitat classified as suitable NRF habitat (374 acres)

Direct, Indirect, and Cumulative Effects for woodpeckers and cavity nesters

Alternative 1 – There are no impacts to woodpeckers or cavity nesters because there is no proposed action under this alternative, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 – Both action alternatives are expected to remove trees, snags and logs that afford suitable nesting and foraging habitat for the above listed woodpeckers. Alternative 2 would have the added impact of constructing a trail through LSOG habitat that provides habitat for pileated woodpeckers and potential habitat for white-headed woodpeckers. Depending upon the size and number of trees removed, there could be impacts to local woodpeckers and cavity nesters by removal of this habitat within the project area (Ch. 2, MM#1). If the project occurs during the breeding season, trail construction and other actions that would remove trees (parking lot expansion, lodge construction, and staging area), could have direct, negative impacts to woodpeckers and other cavity nesters. Disturbance during this time could result in nest failure (noise disturbance) or direct loss of individuals (from tree removal or adults away from the nest for too long) (Ch. 2, R#1).

Impacts from the high presence of humans and artificial lighting (Alternative 2) are not expected during the winter when woodpeckers may still be present (many species do not migrate south, but may migrate to lower elevations). Human disturbance during late fall and winter are not as critical as disturbance during the breeding season.

One of the possible indirect impacts by construction of groomed ski trails would be the increase of predators (i.e. accipiters and corvids) to cavity nesters in the area. This would mainly be notable where the trails would go through denser stands of trees and older interior forest stands.

Most woodpeckers that occur within the project area are rated secure or apparently secure by Natureserve (2007), with the exception of the white-headed woodpecker, which is ranked as imperiled, and the three-toed woodpecker and black-backed woodpecker, which are ranked as vulnerable.

This project would add incrementally to ongoing and reasonably foreseeable actions, cumulatively adding to the loss of snag and log habitat across the subwatersheds within and adjacent to the project area. Although this habitat is continually removed for new trail projects and maintenance of trails, timber sales, and hazard tree removal projects, recurring insect and disease events also create habitat, thus the project is adding cumulatively to the removal of this habitat, but the cumulative impacts are not expected to be adverse because of the continued addition of habitat. This alternative may impact individuals and habitat, but would not likely contribute to a trend towards Federal listing for any woodpeckers or cavity nesters.

Other Rare and Uncommon Species

In 1994, the Northwest Forest Plan developed a system of reserves, the Aquatic Conservation Strategy, and various standards and guidelines for the protection of old growth related species. Mitigation measures were included for species that were rare, or thought to be rare due to a lack of available information. These species collectively known as Survey and Manage species were included in standards

and guidelines under Survey and Manage, Protection Buffers, and Protect Sites from Grazing. On July 24, 2007, the Under Secretary of the Department of Agriculture signed a new Survey and Manage Record of Decision[2] that removed the survey and manage requirements from all of the National Forests' land and resource management plans (LRMPs) within the range of the northern spotted owl. However, since the court in *Northwest Ecosystem Alliance et al v. Mark Rey et al, Civ. No. 04-844, Western District of Washington* has not yet granted the government's motion to lift the modified October 11, 2006 injunction, this project has been designed to be consistent with the 2001 Survey and Manage ROD as modified by subsequent annual species reviews as allowed by the modified October 11, 2006 injunction.

Terrestrial species thought to occur on the Deschutes National Forest included the Crater Lake Tightcoil (*Pristiloma arcticum crateris*) and the Great Gray Owl (*Strix nebulosa*). The Crater Lake tightcoil was included in a group of eight mollusk species where equivalent-effort pre-disturbance surveys were required even though it was considered a Category B species (species are considered rare, where pre-disturbance surveys are not practical) based on direction in the 2001 Record of Decision. In the subsequent 2002 Annual Species Review Memorandum (USDA and USDI 2003), the Crater Lake Tightcoil was changed from a Category B to a Category A species, where species are considered rare and pre-disturbance surveys are considered practical. The Crater Lake Tightcoil is also a R6 Sensitive Species and the effects discussion is located in that section of this EA. The great gray owl was a Category C species which were species considered uncommon and where pre-disturbance surveys are practical. The status of the great gray owl has not changed during subsequent reviews. The discussion for the great gray owl is located in the Management Indicator Section of this EA.

Birds of Conservation Concern, Landbirds, and Shorebirds

Executive Order 13186 (signed by President Clinton in 2001) provides for enhanced cooperation between the Forest Service and USFWS in regards to addressing impacts to neotropical migratory birds in conjunction with the Migratory Bird Treaty Act. Specific activities are identified where cooperation between the parties will substantially contribute to conservation and management of migratory birds, their habitat, and associated values, and thereby advances many of the purposes of the Executive Order.

In response to this Executive Order and subsequent 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 4) Unique Habitats (Lodgepole Pine, White Bark Pine, Meadows, Aspen, and Subalpine Fir). There is no Oak-Pine Woodland, White Bark Pine, or Meadow habitat within the proposed project areas.

Another publication became available in 2002 from the U.S. Fish and Wildlife Service entitled "Birds of Conservation Concern 2002" (BCC) which 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 Endangered Species Act (ESA) of 1973. Bird species considered for inclusion on lists in this report include non-game birds, gamebirds without hunting seasons, subsistence-hunted non-game species in Alaska, and Endangered Species Act candidates, proposed endangered or threatened, and

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[2] Complete Title: Record of Decision To Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Forest Service Land and Resource Management Plans Within the Range of the Northern Spotted Owl

recently delisted species. While all of the bird species included in BCC 2002 are priorities for conservation action, the list makes no finding with regard to whether they warrant consideration for ESA listing. The goal is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservations actions (USFWS 2002).

From this publication, Bird Conservation Regions (BCRs) were developed based on similar geographic parameters. One BCR encompasses the Bend/Ft.Rock Ranger District –BCR 9, Great Basin. Species on these lists are discussed within this document if they were known to or potentially could occur within the proposed treatment areas.

In 2004, a publication called "High Priority Shorebirds – 2004" became available, also by the U.S. Fish and Wildlife Service. This publication identifies U.S. and Canadian shorebird populations that are considered highly imperiled or of high conservation concern by the U.S. Shorebird Conservation Plan as of August 2004.

Table 16. Landbird Focal Species with habitat in the project area.

Species	Status	Habitat	Presence
Pygmy nuthatch	Landbird focal species,	Mature ponderosa pine forests and snags	Habitat occurs within the proposed project area.
Chipping sparrow	Landbird focal species	Open understory ponderosa pine forests with regeneration	Habitat and sightings occur within the proposed project area.
Brown creeper	Landbird focal species	Large trees in mixed conifer forests	Habitat occurs within the proposed project area.
Flammulated owl	Landbird focal species, BCC,	Interspersed grassy openings and dense thickets in mixed conifer forests	Habitat and sightings occur within the proposed project area.
Hermit thrush	Landbird focal species	Multi-layered/dense canopy in mixed conifer forests	Habitat and sightings occur within the proposed project area.
Olive-sided flycatcher	Landbird focal species	Edges and openings created by wildfire in mixed conifer forests	Habitat and sightings occur within the proposed project area.

The species in the following table do not have habitat present within the project area and will not be considered further. Refer to the Wildlife Report in the project file for rationale regarding habitat availability.

Table 17. Landbirds focal species and BCC with no habitat in the project area.

Species	Status	Habitat	Presence
Clark's Nutcracker	Landbird focal species	High elevation mountains, mature/old-growth whitebark pine	No habitat within or adjacent to the proposed project area
Swainson's hawk	BCC	Open country	No habitat within or adjacent to the proposed project area.
Ferruginous hawk	BCC	Open sagebrush flats; open country	No habitat within or adjacent to the proposed project area.
Prairie falcon	BCC	Rimrock, cliffs in open country	No habitat within or adjacent to the proposed project area.
American golden plover	BCC, Shorebird	Upland tundra, rare in OR in dry mudflats, fields and pastures	No habitat within or adjacent to the proposed project area.
Snowy plover	BCC, Shorebird	Sandy beaches	No habitat within or adjacent to the proposed project area.
American avocet	BCC	Shallow water	No habitat within or adjacent to the proposed project area.
Solitary sandpiper	BCC, Shorebird	Small, freshwater mudflats	No habitat within or adjacent to the proposed project area.
Whimbrel	BCC, Shorebirds	Grassy marshes and tidal flats	No habitat within or adjacent to the proposed project area.

Species	Status	Habitat	Presence
Long-billed curlew	BCC, Shorebird	Dry grasslands	No habitat within or adjacent to the proposed project area.
Marbled godwit	BCC, Shorebird	Coastal mudflats, sandy ocean beaches, wet margins of reservoirs or brackish lakes and sewage ponds	No habitat within or adjacent to the proposed project area.
Sanderling	BCC, Shorebird	Sandy beaches with wave action	No habitat within or adjacent to the proposed project area.
Wilson's phalarope	BCC, Shorebird	Shallow ponds within grassy marshes	No habitat within or adjacent to the proposed project area.
Yellow-billed cuckoo	BCC	Riparian hardwoods	No habitat within or adjacent to the proposed project area.
Burrowing owl	BCC	Open grassland or agricultural land	No habitat within or adjacent to the proposed project area.
Black swift	BCC	Damp coastal cliffs	No habitat within or adjacent to the proposed project area.
Loggerhead shrike	BCC	Open habitat with scattered trees and shrubs	No habitat within or adjacent to the proposed project area.
Gray vireo	BCC	Rocky, dry hillsides with scattered trees	No habitat within or adjacent to the proposed project area.
Virginia's warbler	BCC	Mountain mahogany	No habitat within or adjacent to the proposed project area.
Brewer's sparrow	BCC	Sagebrush habitats	No habitat within or adjacent to the proposed project area.
Sage sparrow	BCC	Sagebrush habitats	No habitat within or adjacent to the proposed project area.
Piping plover	Shorebird	Rare in OR on sandy beaches	No habitat within or adjacent to the proposed project area.
Mountain plover	Shorebird	Shortgrass prairies	No habitat within or adjacent to the proposed project area.
Buff-breasted sandpiper	Shorebird	Nests in tundra, forages on shortgrass prairie	No habitat within or adjacent to the proposed project area.
Black oystercatcher	Shorebird	Coastal rocks	No habitat within or adjacent to the proposed project area.
Upland sandpiper	Shorebird	Grassy fields (4-8" tall) with open patches	No habitat within or adjacent to the proposed project area.
Bristle-thighed curlew	Shorebird	Rare in OR in marshes or beaches. Nests in Alaska tundra	No habitat within or adjacent to the proposed project area.
Hudsonian godwit	Shorebird	Mudflats and shallow water; nests around spruce woods	No habitat within or adjacent to the proposed project area.
Black turnstone	Shorebird	Tundra, winters on rocky, coastal shores	No habitat within or adjacent to the proposed project area.
Surfbird	Shorebird	Nests on barren gravel hilltops, winters on rocky shorelines	No habitat within or adjacent to the proposed project area.
Western sandpiper	Shorebird	Mudflats and sandy beaches	No habitat within or adjacent to the proposed project area.
Rock sandpiper	Shorebird	Rocky shorelines	No habitat within or adjacent to the proposed project area.
Short-billed dowitcher	Shorebird	Mudflats and shallow muddy ponds along coast	No habitat within or adjacent to the proposed project area.
American woodcock	Shorebird	Damp, brushy woods	No habitat within or adjacent to the proposed project area.
Wilson's plover	Shorebird	Rare in OR on sandy beaches, sandflats or mudflats away from shoreline	No habitat within or adjacent to the proposed project area.
American oystercatcher	Shorebird	Rare in OR on rocky coasts	No habitat within or adjacent to the proposed project area.
Bar-tailed godwit	Shorebird	Low tundra in western Alaska	No habitat within or adjacent to the proposed project area.

Species	Status	Habitat	Presence
Ruddy turnstone	Shorebird	Rocky and sandy shorelines	No habitat within or adjacent to the proposed project area.
Red Knot	Shorebird	Sandy beaches	No habitat within or adjacent to the proposed project area.
Dunlin	Shorebird	Sandy beaches and mudflats	No habitat within or adjacent to the proposed project area.

Pygmy Nuthatch

Landbird Focal Species

Existing Condition

Pygmy nuthatches are a focal species for large trees in the ponderosa pine stand types (Altman 2000). In Oregon, it occurs in mature and old growth ponderosa pine or mixed-species forests dominated by ponderosa pine. However, sometimes they forage in young ponderosa pines and in lodgepole pine stands adjoining or near ponderosa pine stands (Stern, Del Carlo et al 1987). They nest in cavities in snags or dead portions of live trees (Norris 1958). Foraging is on outer branches in upper canopy on needle clusters, cones, and emerging shoots. Their diet varies by season and locale, but consists mainly of insects (Norris 1958). Population declines have been based on habitat deterioration caused by loss of large diameter snags and replacement of large ponderosa pines with smaller trees and other conifer species through fire control and logging (Agee 1993).

This species has not been observed within the project area, but could occupy many of the stands within the project area.

Direct, Indirect, and Cumulative Effects

Alternative 1 - There are no impacts to pygmy nuthatches because there is no proposed action under this alternative, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 – Both action alternatives are expected to remove foraging habitat for pygmy nuthatches. Alternative 2 would have the added impact of constructing a trail through LSOG habitat that provides potential nesting habitat for this species (along 0.78 miles or a total of 1.7 acres). Depending upon the size and number of trees removed, there could be impacts to this species by removal of this habitat within the project area (Ch. 2, MM#1). If the project occurs during the breeding season, trail construction and other actions that would remove trees (parking lot expansion, lodge construction, and staging area), could have direct and indirect negative impacts to pygmy nuthatches. Disturbance during this time could result in nest failure (noise disturbance) or direct loss of individuals (from tree removal or adults away from the nest for too long) Ch. 2, R#1).

Impacts from the high presence of humans, trail grooming, and artificial lighting (Alternative 2) are not expected during the winter when pygmy nuthatches may still be present (many species do not migrate south, but may migrate to lower elevations). Human disturbance during late fall and winter are not as critical as disturbance during the breeding season.

One of the possible indirect impacts by creating the groomed ski trails would be the increase of predators (i.e. accipiters and corvids) to cavity nesters in the area. This would mainly be notable where the trails would go through denser stands of trees and older interior forest stands.

This species is apparently secure in Oregon. The implementation of this project may impact individuals, but is not expected to contribute to negative cumulative impacts to this species or cause a trend towards federal listing.

Chipping Sparrow
Landbird Focal Species

Habitat Needs and Existing Conditions

Chipping sparrows are a focal species of more open ponderosa pine stands with active regeneration (Altman 2000). The chipping sparrow is a low-tree/ground-nester that uses open-overstory ponderosa pine and lodgepole pine (Marshall et al 2003). This species prefers these open coniferous forests or stands of trees interspersed with grassy species or other areas of low foliage suitable for ground foraging (Farner 1952). In Central Oregon, they are found in good numbers in juniper, ponderosa pine, and lodgepole pine forests. This bird species feeds primarily on seeds of grasses and herbaceous annuals, adding insects and other invertebrates when breeding (Middleton 1998). Habitat changes have brought on increased risk of cowbird brood parasitism and competition with house sparrows and house finches (Middleton 1998).

Potential habitat for this species may be characterized by the smaller size class and low canopy cover stands within the project area. This species has been observed within the project area.

Direct, Indirect, and Cumulative Effects

Alternative 1 - There are no impacts to chipping sparrows because there is no proposed action under this alternative, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 – Approximately 0.75 miles of trail traverse through potential chipping sparrow habitat with the action alternatives, which would remove 1.6 acres of habitat. This is not a large amount of total habitat loss, and this species could occupy many acres within and adjacent to the project area. Direct and indirect negative impacts could occur during implementation of the project (felling of trees, brushing of trails, etc.) if it occurs during the breeding season. Disturbance during this time could result in nest failure (noise disturbance) or direct loss of individuals (from tree/shrub removal or adults away from the nest for too long) (Ch. 2, R#1).

Impacts from the high presence of humans, trail grooming, and artificial lighting (Alternative 2) are not expected during the late fall and winter. Chipping sparrows are migratory, and are not in the area during this time.

One of the possible indirect impacts by creating the groomed ski trails would be the increase of predators (i.e. accipiters and corvids) and nest parasitism (brown-headed cowbirds) to chipping sparrows in the area.

This species is apparently secure by Natureserve (2007) in Oregon. The implementation of this project may impact individuals, but is not expected to contribute to negative cumulative impacts to this species or cause a trend towards federal listing.

Brown Creeper
Landbird Focal Species

Existing Condition

Brown creepers are a focal species for large trees within mixed conifer (i.e. white or Douglas-fir) plant association (Altman 2000). They usually nest under loose, sloughing bark of relatively large diameter dead trees (Marshall et al 2003).

Brown creepers have not been observed in the project area, but habitat does exist (NRF stands), and they are expected to occur within this habitat.

Alternative 1 - Direct, Indirect, and Cumulative Effects of No Action

There are no impacts to brown creepers because there is no proposed action under this alternative, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 – Both action alternatives are expected to remove foraging habitat for brown creepers. Alternative 2 would have the added impact of constructing a trail through LSOG habitat that provides potential nesting habitat for this species (along 0.78 miles or a total of 1.7 acres). Depending upon the size and number of trees removed, there could be impacts to this species by removal of this habitat within the project area (Ch. 2, MM#1). If the project occurs during the breeding season, trail construction could have direct and indirect negative impacts to brown creepers. Disturbance during this time could result in nest failure (noise disturbance) or direct loss of individuals (from tree removal or adults away from the nest for too long) (Ch. 2, R#1).

Impacts from the high presence of humans, trail grooming, and artificial lighting (Alternative 2) are not expected during the late fall and winter. Brown creepers are migratory, and are not in the area during this time.

One of the possible indirect impacts by creating the groomed ski trails would be the increase of predators (i.e. accipiters and corvids) to this species in the area. This would mainly be notable where the trails would go through denser stands of trees and older interior forest stands.

This species is apparently secure in Oregon. The implementation of this project may impact individuals, but is not expected to contribute to negative cumulative impacts to this species or cause a trend towards federal listing.

Flammulated Owl

Landbird Focal Species, Bird of Conservation Concern

Habitat Needs and Existing Condition

Flammulated owls are a focal species of grassy opening and dense thickets within late-successional mixed conifer plant associations. This species is most closely associated with ponderosa pine forests, but also nests in mixed coniferous stands dominated by ponderosa pine and include Douglas-fir, grand fir and/or western larch. Forest stands used for nesting tend to have moderate to high levels of canopy closure with rather open understory or an open area adjacent (Bull and Anderson 1978). These areas also contain very dense patches of saplings or shrubs, which are used as roost sites (Goggans 1985).

The flammulated owl is a cavity nester. Most cavities are in snags, but some are found in live trees, which ponderosa pine is most commonly used. Snags and trees used for nesting average 22 to 28 inches in diameter (Bull et al. 1990).

Flammulated owls were heard in the project area during surveys for the northern spotted owl. There was no confirmed nesting, although it is suspected because vocalizations were made during the breeding season and consistently from particular area(s). The vocalizations were in areas of proposed trails.

Direct, Indirect, and Cumulative Effects

Alternative 1 - There are no impacts to flammulated owls because there is no proposed action under this alternative, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 - Both action alternatives are expected to remove foraging habitat for flammulated owls. Alternative 2 would remove potential nesting habitat along approximately 1 mile of trail (2.2 acres) and Alternative 3 would remove potential nesting habitat along approximately 1.75 miles of trail (3.8 acres). Depending upon the size and number of trees and snags removed, there could be impacts to this species by removal of this habitat within the project area (Ch. 2, MM#1). If the project occurs during the breeding season, trail construction could have direct and indirect negative impacts to flammulated owls.

Disturbance during this time could result in nest failure (noise disturbance) or direct loss of individuals (from tree removal or adults away from the nest for too long) (ch. 2, R#1).

Impacts from the high presence of humans, trail grooming, and artificial lighting (Alternative 2) are not expected during the late fall and winter. Flammulated owls are migratory, and are not in the area during this time.

One of the possible indirect impacts by creating the groomed ski trails would be the increase of predators (i.e. accipiters and corvids) to owls in the area. This would mainly be notable where the trails would go through denser stands of trees and older interior forest stands.

This species is apparently secure in Oregon. The implementation of this project may impact individuals, but is not expected to contribute to negative cumulative impacts to this species or cause a trend towards federal listing.

Hermit Thrush

Landbird Focal Species, S4 Apparently Secure

Existing Condition

Hermit thrushes are a focal species of multi-layered, dense mixed conifer stands (Altman 2000). This species breeds in mature forests of all types that provide a shaded understory of brush and small trees (Aldrich 1968). Hermit thrush nest on the ground, in dense brush, or in small trees (Mannan 1980).

Hermit thrushes have been observed within the project area. No nesting was confirmed but it is assumed because of the presence of suitable habitat and the observations of adults in suitable habitat.

Direct, Indirect, and Cumulative Effects

Alternative 1 - Since there is no proposed action under this alternative there are no impacts to hermit thrush, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 - Both action alternatives are expected to remove foraging habitat for hermit thrushes and remove potential nesting habitat along approximately 3 miles of trail (6.5 acres). This is not a lot of habitat within the project area, but the trail would invite impacts of its own. If the project occurs during the breeding season, trail construction could have direct and indirect negative impacts to hermit thrushes. Disturbance during this time could result in nest failure (noise disturbance) or direct loss of individuals (from tree/shrub removal or adults away from the nest for too long) (Ch. 2, R#1).

Impacts from the high presence of humans, trail grooming, and artificial lighting (Alternative 2) are not expected during the late fall and winter. Hermit thrushes are migratory, and are not in the area during this time.

One of the possible indirect impacts by creating the groomed ski trails would be the increase of predators (i.e. accipiters and corvids) and nest parasitism (brown-headed cowbirds) to this species in the area.

This species is ranked apparently secure in Oregon (Natureserve 2007). The implementation of this project may impact individuals, but is not expected to contribute to negative cumulative impacts to this species or cause a trend towards federal listing.

Olive-sided Flycatcher

Landbird Focal Species, S3 Vulnerable

Habitat Needs and Existing Condition

Olive-sided flycatchers are a focal species of edges and openings created by wildfires (Altman 2000). Breeding habitat is in conifer forests with the following circumstances: within forest burns where snags

and scattered tall, live trees remain; near water along the wooded shores of streams, lakes, rivers, beaver ponds, marshes, and bogs, often where standing dead trees are present; at the juxtaposition of late- and early-successional forest such as meadows, harvest units, or canyon edges; and in open or semi-open forest stands with a low percentage of canopy cover (Altman and Sallabanks 2000). It forages mostly from high, prominent perches at the top of snags or the dead tip or uppermost branch of a live tree.

This bird species has been steadily declining since 1966. Factors potentially related to the decline of the species on breeding grounds include habitat loss through logging, alteration of habitat from forest management practices including clearcutting and fire suppression, lack of food resources, and reproductive impacts from nest predation or parasitism.

There are no areas that have been burned recently within the project area. There are some areas of beetle kill where olive-sided flycatchers could reside, but in this area, most occur within previously treated stands.

Direct, Indirect, and Cumulative Effects

Alternative 1 - Since there is no proposed action under this alternative there are no impacts to olive-sided flycatcher, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 - Both action alternatives are expected to remove potential foraging and nesting habitat for olive-sided flycatchers along approximately 2 miles of trail (4.4 acres). This is not a lot of habitat within the project area, and for the most part the habitat the trail would be in is more open and less habitat would need to be removed. If the project occurs during the breeding season, trail construction could have direct and indirect negative impacts to these flycatchers. Disturbance during this time could result in nest failure (noise disturbance) or direct loss of individuals (from tree removal or adults away from the nest for too long) (Ch. 2, R#1).

Impacts to this species from the high presence of humans, trail grooming, and artificial lighting (Alternative 2) are not expected during the late fall and winter. Olive-sided flycatchers are migratory, and are not in the area during this time.

One of the possible indirect impacts by creating the groomed ski trails would be the increase of predators (i.e. accipiters and corvids) and nest parasitism (brown-headed cowbirds) to this species in the area.

This species is rated vulnerable in Oregon (Natureserve 2007). The implementation of this project may impact individuals, but is not expected to contribute to negative cumulative impacts to this species or cause a trend towards federal listing.

Special Habitat Features

Snags

Numerous species of animals use snags for foraging, nesting, denning, roosting and resting. A snag is defined as a dead tree that is over 10 inches dbh and taller than 10 feet. The most notable species that use snags and are the primary cavity nesters (e.g. woodpeckers and nuthatches) that excavate nest cavities in decayed wood in standing trees. Vacated cavities are subsequently used by many other birds and small mammals (i.e. secondary cavity users). Where wildlife species that utilize these habitat and that are known or suspected to occur in the proposed action areas, it is shown in the species lists (Tables 5, 11, 13), and can be found within the specific discussions under each species (e.g. hairy woodpecker, three-toed woodpecker, flammulated owl, etc.). The American marten is known to use larger cavities for nesting, and some bat species roost underneath bark sloughing off from snags.

Coarse Woody material

Coarse woody material is considered to be dead and down material that is 5 inches in diameter (Mellen et al 2006). Coarse woody material (CWM), or logs, can be considered as either places animals forage or places that afford them protection. Besides hiding cover and protection, logs provide physically complex structures where animals find stable temperatures and moisture for nesting, denning, feeding, and food storage (Bull et al. 1997).

Small mammals use logs extensively as runways, making these areas important for birds of prey or other mammals that feed on these small mammals.

The smaller logs can benefit small mammals, amphibians, and reptiles, for which they function primarily as escape cover and shelter when the animal can get inside or under the log. Large diameter logs, especially hollow ones, also benefit a variety of other vertebrates lake martens, minks, coyotes, bobcats, cougars, and black bears. Bears will use hollow logs for winter dens, and forage for invertebrates in logs during the summer and fall. Fishers are known to use hollow logs for denning, along with decaying or dead trees (Bull et al. 1997).

Large numbers of downed trees (i.e. "jackstraw condition") can provide critical structure for some mammals. Marten, mink, and cougar hunt in them; when snow covers the logs, a complex array of snow-free spaces and runways provide important habitat for protection and foraging by martens, fishers, and small mammals under the snow. Tree squirrels also spend much of the winter in this type of environment, feeding on seeds from stashed cones (Bull et al. 1997).

No analysis on the amounts of snags or coarse woody material in the project area (or within the watershed) has been done. A DecAid analysis is not required for this project.

During field reconnaissance, this type of habitat was observed at varying levels. Within older multi-storied stands, snags and CWM was common. In younger single and multi-storied stands, and in areas previously treated, snags and CWM was not as common, as is seen across much of the District.

Direct, Indirect, and Cumulative Effects

Alternative 1 - Since there is no proposed action under this alternative there are no impacts to dead wood habitat, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 – The action alternatives have a direct possibility of cutting down snags and removing CWM from the ground. This activity could have local impacts to the very species that depend on this type of habitat (Ch. 2, MM#1). Although this project could impact snag and CWM habitat and thus individual species that utilize it, it would not negatively impact populations or contribute towards a trend to federal listing.

Many other projects listed in Table 5 would also be removing snags and removing and/or disturbing CWM either within the project area (Sparky and misc. trail maintenance) or within the subwatershed. This project would add cumulatively to the loss of snags and CWM habitat, thus impacting wildlife species known to be associated with decayed wood for part or all of their life's needs. The loss from this project would be more localized and associated with the trails themselves and not across the landscape.

Late Seral and Old Growth Habitat

Late Seral and Old Growth Habitat (LSOG) habitat contributes to the overall biological diversity within the landscape. These forests have integrity as a functioning ecosystem with the ability to provide habitat to species associated with the forest interior that is influenced by stand size (Rosenburg and Raphael 1986). Logging and other human activities have reduced the size and connectivity of these forests. This fragmentation increases the ecological importance of the remaining stands, including their value as habitat for forest interior animals. The impact of this isolation and fragmentation is not fully understood, but populations and numbers of species associated with LSOG forests decreases with fragmentation and reduction in stand size.

There are no Northwest Forest Plan Late Successional Reserves (LSR) or Forest Plan Old Growth Management Areas (OGMA) within the project area. The closest known LSR is approximately three miles to the southwest, and the closest OGMA is approximately one mile southwest of the southwest edge of the project area boundary. There is suitable nesting, roosting, and foraging habitat for the northern spotted owl within the project area, which contains many habitat constituents for old growth habitat (large trees, snags, and CWM) and may be considered LSOG habitat.

Direct, Indirect, and Cumulative Effects

Alternative 1 - Since there is no proposed action under this alternative there are no impacts to LSOG habitat, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 – Alternative 2 proposes to add 0.78 miles of trail through the middle of potential LSOG habitat. This trail would effectively remove approximately 1.7 acres. Although this is not large total habitat loss, the edge effects that could occur from this trail would impact approximately 38 acres (placing a buffer of 200 feet on each side of the trail as the area of edge effect – see fragmentation below). This trail would fragment this stand, increasing the edge effects that already occur from roads and forest treatments adjacent to the stand, reducing its effectiveness as a possible wildlife corridor and interior habitat for species such as the northern goshawk and northern spotted owl. This alternative would add cumulatively to fragmentation and addition of edge effects to the ongoing and reasonably foreseeable actions that are currently or would potentially be impacting LSOG habitat.

Under Alternative 3 this trail is located out of this LSOG habitat, skirting the edge of it. This could still have edge effects to those sections closest to it, but would not fragment this stand as Alternative 2 would. This alternative is not expected to cumulatively add to the loss and fragmentation of LSOG habitat.

Fragmentation

Fragmentation, or breaks in connectivity, reduces the size and connectivity of stands that compose a forest (FEMAT 1993). Fragmentation can occur as natural openings or result from induced methods that may be irretrievable or retrievable. Irretrievable fragmentation is induced by the development of surfaced roads, powerlines, rock pits, and building sites. However, the majority of fragmentation occurring within the forest and this project area is retrievable. Retrievable fragmentation includes wildfires, harvest treatments, native surface roads, areas of insect invasion or disease pockets, and areas of blowdown. This fragmentation may take a few to several decades to once again provide connectivity with eventual re-establishment of large continuous stands. Connectivity would not be re-established within irretrievable fragmentation.

One of the effects of fragmentation includes changing the microclimate by increased evaporation, temperature and solar radiation, and a decrease in soil temperature (Reed et al. 1995). Another effect is what is called the “edge effect.” Edge habitats are those that provide two kinds of habitat for food and cover needs. All of the activities mentioned above provide edge habitat. The richness and density of generalist bird species usually increases along forest edges because of the variety of vegetation and abundance of food. However, migratory bird populations may decline and the numbers of some habitat specialist species may decrease near edges. Increases in nest predation by small mammals, snakes, ravens, and crows are a commonly cited cause of these declines (B.C. Ministry of Forests Research Program 1998), as well as the influx of nest parasites as the brown-headed cowbird.

Not mentioned above, is the fragmentation that can arise from trails. Although these types of retrievable fragmentation sources are small in comparison to roads, they can still impact population structure of wildlife species. As with anything that is built on the landscape, any trail changes its surroundings. Some of which are minor and temporary (such as a deer that is disturbed by a hiker that returns once the hiker is gone) and others, which are more major and long lasting (such as an aggressive bird species that follows a trail expanding its habitat, displacing sensitive species and songbirds). As people intrude into an area, the effects on animals can include altered behavior, increased stress, or changes in productivity and diet. The

populations can change in size and distribution, and the species composition and interactions of whole communities can change (Knight and Cole 1991). The changes can extend from several feet to hundreds, even thousands of feet (Trails and Wildlife Task Force et al. 1998).

Morrison, Marcot, and Mannan (1992) describe that providing adequate patch size helps maintain patch-interior conditions. Forest fragments are subject to drying and invasion by early successional plant species along edges and at large openings. A rule of thumb is that such effects occur at least two tree heights (approximately 200-400 feet) into the forest stands from the edge, road, or large opening. Thus, a forest fragment less than 80 acres in size consist of only 30 acres of core habitat. Some environmental conditions, such as equable temperature and moisture regimes, are found only in interiors of forest stands. To protect interiors of forests for wildlife species closely associated to old growth temperate conifer forests of the Western U.S. (i.e. northern spotted owl and northern goshawk), a starting guideline would be to provide a patch size of at least 80 acres.

Irretrievable and retrievable sources of fragmentation were mapped (see Wildlife Report). A buffer of 400 feet was placed on the edges of wildfires and forest treatment areas, with 200-foot buffers on each side of a road and groomed trails, and 20-foot buffers from the edges of biker and hiker trails. The areas outside of these buffers are the available wildlife habitat patches. Table 18 summarizes the existing conditions of this buffer to habitat.

Table 18. Summary of Fragmentation Attributes in the Meissner Project Area and Pertaining Subwatersheds.

Fragmentation	Meissner Project Area	Benham Falls	Lava Island Falls	Coyote Spring	Dutchman Creek	Spring River
Irretrievable Roads	55	502	436	32	549	403
Retrievable Roads	1,172	3,935	4,577	3,062	3,381	4,830
Ret. Snowmobile Trails	0	137	28	0	721	21
Retrievable Harvest	1,296	3,339	3,894	2,706	3,881	5,753
Retrievable Trails	44	83	190	18	83	2
Natural Openings	0	442	554	496	1,429	137
Irretrievable Developed	17	44	323	109	71	230
Fire	0	0	211	0	0	86

As the table shows, much of the fragmentation occurs from retrievable roads and retrievable harvest.

Most habitats available on the west side of the Meissner project area are considered edge from excessive numbers of roads and past timber harvest. The east side of the project area is less impacted by either of these. Approximately 56% of the project area is fragmented. There are several areas that provide >80-acre patches, but these areas have little connective habitat between them. On the east side of the project are these connections are disrupted mainly by roads, and on the west side, roads and past harvest. LSOG (NRF) habitat occurs where some of the non-fragmented larger patches are, but are still impeded by fragmentation from roads and harvest areas. LSOG habitat that meets the structural characteristics still may not meet wildlife needs due to fragmentation and effects of edge. Reduction of fragmented areas is critical to maintain connectivity and interior habitats for LSOG species.

To provide for wildlife needs, fragmentation should not exceed 50% within a subwatershed (professional judgment by the Bend/Ft. Rock Wildlife Staff). As mentioned above, at least 56% of the project area is impacted by edge, and the two subwatersheds the project occurs in are at 55% and 58% fragmentation. That means that wildlife species that would normally inhabit the remaining stands (i.e. northern spotted owls, northern goshawk, flying squirrels, fisher, and marten to name a few) may occur incidentally or may have been displaced due to fragmentation and the effects of edge habitat. The other subwatersheds included in the assessment have been significantly impacted by fragmentation also (see Table 19).

Table 19. Fragmentation within the Project Area and Pertaining Subwatershed

Subwatershed	Acres	Non-Fragmented Acres	Fragmented Acres	% Fragmentation
Meissner PA	4,643	2,059	2,584	56%
Benham Falls	15,520	7,038	8,482	55%
Lava Island Falls	17,565	7,352	10,213	58%
Coyote Springs	10,385	3,962	6,423	62%
Dutchman Creek	21,137	11,022	10,115	48%
Spring River	16,404	4,942	11,462	70%

The areas not heavily fragmented are the tops of buttes, some lodgepole pine stands (most of which have either been impacted by insects and diseases and/or woodcutters) and tracts of black bark pine stands. Wildlife that relies on unfragmented habitats would seek these areas if the plant association is suitable for their needs.

Direct, Indirect, and Cumulative Effects

Alternative 1 - Since there is no proposed action under this alternative there are no impacts that would lead to increased landscape fragmentation, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternatives 2 and 3 - The majority of the fragmentation is retrievable (native surface roads and past harvest units). It is highly unlikely, though, that system native surface roads and trails would be allowed to return to a vegetative state. Table 20 displays the fragmentation that would result from the action alternatives. Much of the fragmentation from these alternatives overlaps with other areas of existing fragmentation. Alternative 2 would increase fragmentation by 3% within the project area, but would not increase fragmentation within the Benham Falls subwatershed, and would increase fragmentation within the Lava Island subwatershed by 2%. Alternative 3 would increase fragmentation by 2% within the project area and 0-1% within the Benham Falls and Lava Island Falls subwatersheds respectively.

Table 20. Fragmentation from Alternatives 2 and 3

Subwatershed	Non-Fragmented Acres	Fragmented Acres	% Fragmentation
Meissner PA	1,920 (alt. 2) 1,938 (alt. 3)	2,723 (alt. 2) 2,705 (alt. 3)	59% (alt. 2) 58/% (alt. 3)
Benham Falls	7,025 (alt. 2) 7,028 (alt. 3)	8,495 (alt. 2) 8,492 (alt. 3)	55% (alt. 2) 55% (alt. 3)
Lava Island Falls	7,079 (alt. 2) 7,280 (alt. 3)	10,486 (alt. 2) 10,285 (alt. 3)	60% (alt. 2) 59% (alt. 3)

Both action alternatives would add to human-caused fragmentation and edge effects by adding ski trails (groomed and un-groomed) to this area. Alternative 2 would have the greatest impact by placing a trail through suitable LSOG (and NRF) habitat. Both alternatives would fragment this NRF habitat north of the Meissner Sno-park and east of the 4615 Road, but Alternative 2 fragments this stand to the point where there is no core habitat available, and the entire stand is considered edge (see Figure 8 in Appendix C). There is currently a goshawk pair nesting in this stand. This stand has already been heavily impacted by roads, past harvest activities and trails, creating a stand with less than 80 acres of core habitat. Additions of a ski trail, especially through this stand, may create an environment within the stand not suitable for this goshawk pair, potentially causing them to abandon the area.

There are many areas of core habitat within the project area. Most of the proposed trails are concentrated within one mile of Meissner Sno-park. Much of the fragmentation from the trails in Alternatives 2 and 3 overlap with other areas of fragmentation from roads and harvest activities. Alternative 2 and 3 would heavily impact the habitat available on the east side of the project area because of the concentration of trails in a small area. Alternative 3 moves the trail out of the NRF/LSOG habitat, but still has similar fragmentation impacts to the surrounding area. These trails are retrievable, but would most likely remain on the landscape long-term. The harvest areas that they overlap may one day provide non-fragmented habitat for wildlife. Both alternatives would minimally impact the west side of the project area as new trails are less numerous.

The creation of 18 foot wide groomed ski trails is similar to creating a new road. Being similar in size as a road comes similar impacts of a road. The first is an invitation for increased human use. The trails would benefit some species while harming others. They offer a competitive advantage to disturbance-adapted species, which typically do not need such an advantage, while creating a sink habitat for others; roads create both edge habitat and habitat fragmentation. They serve as corridors for pests and non-native plant species, but also sever the travel corridors used by other species (USDA 1995).

The purpose of these trails is for winter use. The increased human presence occurs during the winter, at a time when critical animal movements and behaviors are minimal. However, many winter trails have or are beginning to be used during the spring, summer, and fall by bikers, hikers, OHVs and vehicles, causing year round disturbance to wildlife species, not just during the winter time when there are less species in the area. There are already some trails within the project area that are not system roads, but snowmobile groomed ski trails, that are being used by vehicles. PDC #3 (chapter 2) is intended to reduce this type of use.

Fragmentation within the subwatersheds that this project occurs in and surrounding subwatersheds are over 50%. Both action alternatives would add cumulatively to the ongoing and reasonably foreseeable actions by adding to fragmentation and edge effects across the landscape. Increasing trails are introducing humans into wider areas across the landscape year round, and fragmentation of habitat decreases this and surrounding areas as effective habitat corridors by increasing edge effects for wildlife species.

Artificial Night Lighting of Trails

There are many different negative impacts on a variety of organisms including mammals, birds, fish, amphibians, reptiles and insects from artificial night lighting. These impacts include disturbance of migration patterns, disruptions in feeding behavior, complete avoidance of lit areas, disruptions in reproductive patterns, and an overall negative impact on nocturnal wildlife physiology (Saleh 2007, IDA 2002, Campaign for Dark skies).

Direct, Indirect, and Cumulative Effects

Alternatives 1 and 3 - Since there is no artificial night lighting proposed with these alternatives, there would be no impacts to species that could be affected by lighting, and without a proposed action that would add incrementally to the ongoing or reasonably foreseeable actions, there would be no cumulative impacts.

Alternative 2 - The impacts from this project would be at night during the winter, when many species of wildlife do not occur because they have either moved to lower elevations or warmer climates (neotropical migratory birds or NTMBs). The possible impacts should not be ignored. Lights are being proposed in an area that has never had night lighting, or an influx of people at night. The wildlife that currently utilizes the area during the winter and at night (i.e. owls, rodents, and potential carnivores including wolverine, fisher and marten) could be impacted as such described by Saleh 2007. PDC #2 in Chapter 2 will be followed.

This action is not expected to add to effects from the ongoing or reasonably foreseeable action, therefore there would be not cumulative impacts.

Botanical Resources

A biological evaluation was prepared for this project to document consideration of Threatened, Endangered, and Sensitive (TES) plants. It was prepared in compliance with the Forest Service Manual (FSM) 2672.4 and the Endangered Species Act of 1973 (Subpart B; 402.12, section 7 consultation).

Effects of this activity are evaluated for those TES plant species on the current Regional Forester's Sensitive Species List (FSM 2670.44, May 13, 1999) that are documented or suspected to occur on the Deschutes National Forest.

Summary of findings:

Alternatives 1 & 3: The proposed action will have no impact on Proposed, Endangered, Threatened, or Sensitive plant species.

Alternative 2: The proposed action may impact individuals or habitat of Newberry's Gentian, but will not likely contribute towards Federal listing.

The area is dominated by several plant associations, including lodgepole pine/bitterbrush/Idaho fescue; mixed conifer/snowbrush; lodgepole pine/sedge-needlegrass basins; lodgepole/sedge-lupine-penstemon; and mixed conifer/snowbrush/sedge. Soils are characterized by sandy volcanic ash and pumice on a buried soil over glacial till. The elevations range between 5200' and 5800'. The average annual precipitation measures in the 15" – 30" range.

Other, relatively localized sensitive plant surveys were conducted in the project area in 1995 and 1998. These surveys did not locate any sensitive plant sites.

In addition to there being habitat and known sites of Newberry's Gentian (GENE), there is a low probability of the green-tinged paintbrush (Castilleja chlorotica) occurring within the project area.

No habitat for Threatened, Endangered, Proposed, or Candidate plant species (these species, and their habitats, are listed in Appendices C and D) exists within the project area, with the possible wildcard exception of Botrychium lineare, a Candidate species. Its range distribution is very wide and its habitat varies just as widely. However, it has not been found on the Deschutes National Forest, (nor more specifically in the project area), after 16 years of project-level surveys, which include complete lists of plants encountered. The nearest known site lies in northeastern Oregon, in Wallowa County.

Additionally, the bryophytes, lichens, and fungi added to the Forest's sensitive plant list in July 2004 do not have potential habitat within the project area (see Appendix B of the Botany Biological Evaluation).

A field survey was conducted in 2006 within likely habitat in the project area; only Newberry's Gentian, a Regional Forester's sensitive plant species, numbering about 7,000 plants, was located within three connected meadows. A trail is proposed in Alternative 2 that would bisect this population.

Effects to TES Plants

Alternative 1 (No Action)

No direct, indirect, or cumulative effects have been identified for the No Action alternative.

Alternative 2 (Proposed Action)

Direct Effects: While in the depths of a snowy winter, there are no particular concerns to the string of meadows the trail is proposed to go through or near. However, during the "shoulder" seasons, when snow is spare, the meadows could be compromised by trail use.

There are about 7,000 GENE plants present in the string of meadows. By placing the trail directly through the meadows, it is conceivable that all plants present there could be jeopardized. The nearest known GENE population, a tiny population of four plants, is about 2.5 miles away, with the core

populations, constituting over a million plants, located about 4-8 miles distant. The population found within the Meissner Nordic Expansion project constitutes about 0.5 % of the local (Deschutes National Forest) population, and an unknown, but even smaller, percentage of the global population (population numbers for those populations found outside the Deschutes National Forest were not available).

The trail may impact individuals or habitat of Newberry's Gentian, but will not likely contribute towards Federal listing. This is because the population located within the project, while numbering in the thousands, still only represents a portion of one percent of the known population on the Deschutes National Forest; and its proportion of the global population is thus even smaller.

The GENE populations found on the Deschutes National Forest occur in generally higher-elevation meadows. These meadows, while not readily accessible for much of the year due to snow cover, do occur in a relatively high-use recreation zone. These meadows receive visits from humans, in the form of illegal bonsai tree taking, illegal driving on them, horse traffic, and other visitors just wanting to walk through the meadows. These all pose some level of risk to the overall well-being of the GENE populations found there. So, the Deschutes population as a whole is probably relatively stable, but human pressures upon their habitat will continue.

Indirect Effects: Other forest uses such as hikers, bikers, and off-road vehicles could potentially fall into the trail, thus further damaging the meadows. If this were to happen, the Newberry Gentian population present in the meadows would also be compromised and reduced.

Cumulative Effects: During a September 2006 visit to the GENE sites within the project, the author did not note any potentially damaging activities occurring to the GENE populations or their habitat, nor are any others planned.

Alternative 3

Direct, Indirect, and Cumulative Effects: None have been identified. This alternative does not propose a trail through the GENE populations.

Other Rare and Uncommon Plant Species

Considered in this section are those species from the vascular, bryophyte, lichen, and fungi plant groups identified in the Final Supplemental Environmental Impact Statement (FEIS): *For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures* released in November 2000, as amended by the Record of Decision signed in January 2001. This SEIS modifies the Survey and Manage and related mitigation measures outlined in the 1994 Northwest Forest Plan Final SEIS.

See Appendix A of the Survey and Manage Report in the project file for the categories into which species are grouped; see Appendix B for a list and brief habitat description of the potential Deschutes National Forest species for which pre-disturbance surveys are required and for which any known sites are required to be managed; see Appendix C for a list of potential Deschutes National Forest species for which any known sites are required to be managed, no pre-disturbance survey required; see Appendix D for Category B species for which all known sites are required to be managed, with pre-disturbance surveys required (i.e. "equivalent effort survey"), and see Appendix E for expanded habitat descriptions and general location information for those species listed in Appendices B and C.

One way the NWFP requires the Forest Service to address late-successional forest ecosystem function is through consideration of "Survey and Manage" species associated with this ecosystem. These are selected species of fungi, lichens, bryophytes, vascular plants, and invertebrate animals whose viability are of concern within this broad ecosystem type.

The November 2000 FEIS identifies six categories into which species are grouped. In order to fall into one of these categories, the species must meet three basic criteria:

1. The species must occur within the Northwest Forest Plan area, or occur close to the NFP area and have potentially suitable habitat within the NFP area.
2. The species must be closely associated with late-successional or old-growth forest.
3. The reserve system and other Standards and Guidelines of the NFP do not appear to provide for a reasonable assurance of species persistence.

All six categories contain a requirement to conduct "strategic surveys," which is something separate from project-level surveys and is not required to be addressed in this document.

Specific habitat information on Survey and Manage species is becoming better understood as species-specific surveys are conducted and data is compiled and compared. However, many habitat descriptions are based on relatively few records and will continue to be scrutinized and refined as new sites are discovered. The following discussion is an effort to assess and apply existing information as it relates to the Meissner Nordic Expansion project.

Prefield Review

The area is dominated by several plant associations, including lodgepole pine/bitterbrush/Idaho fescue; mixed conifer/snowbrush; lodgepole pine/sedge-needlegrass basins; lodgepole/sedge-lupine-penstemon; and mixed conifer/snowbrush/sedge. Soils are characterized by sandy volcanic ash and pumice on a buried soil over glacial till. The elevations range between 5200' – 5800'. The average annual precipitation measures in the 15" – 30" range.

Field Reconnaissance

In 2006, a field survey was conducted in areas of the proposed project where there existed a higher likelihood of finding habitat for sensitive plants. During that survey, habitat for Survey and Manage plant species that would require survey was also kept in mind; none was located.

Vascular Plants

There is no habitat present within the project area for *Botrychium minganense* and *B. montanum*, two grape-fern species, or for *Cypripedium montanum;* these species would require pre-disturbance surveys if habitat is present. Additionally, there are no known sites present within the project area for these species that would, according to FEIS direction, require management of those sites.

Non-vascular Plants

Note: There are currently six non-vascular plant species with potential to occur on the Deschutes NF which had S&M status in 2001 but subsequently were moved to the Sensitive Species list. Analysis for these species can be found within the Meissner Nordic Expansion Biological Evaluation for plants. These species are *Scouleria marginata, Dermatocarpon luridum (*also known as *D. meiophyllizum), Rhizomnium nudum, Leptogium cyanescens, Schistostega pennata*, and *Ramaria amyloidea*.

Bryophytes

Of the bryophytes requiring pre-disturbance survey if habitat is present, there is no habitat present within the project area for *Marsupella emarginata* var. *aquatica, Tritomaria exsectiformis,* and *Tetraphis geniculata.* Additionally, there are no known sites present within the project area for these species that would, according to FEIS direction, require management of those sites.

Lichens

There is no habitat present within the project area for the one lichen, *Pseudocyphellaria rainierensis,* that requires pre-disturbance survey if habitat is present. Additionally, there are no known sites present within

the project area for this species that would, according to FEIS direction, require management of those sites.

Fungi

There is no habitat or known sites present within the project area for the one fungi species, *Bridgeoporous nobilissimus*, that requires pre-disturbance survey if habitat is present. Additionally, there are no known sites present within the project area for the other species that would, according to FEIS direction, require management of those sites.

Effects to Survey and Manage Species

Direct, Indirect and Cumulative Effects of all alternatives: There are no expected direct, indirect, or cumulative effects to Survey and Manage species in this alternative, because there is no Survey and Manage Plant habitat located within the project area, nor are there any known S&M sites present.

Noxious Weeds

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, 29 November 1995).

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 of the Noxious Weed Report.

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.

The area is characterized by multiple plant associations, including lodgepole pine/bitterbrush/Idaho fescue; mixed conifer/snowbrush; lodgepole pine/sedge-needlegrass basins; lodgepole/sedge-lupine-penstemon; and mixed conifer/snowbrush/sedge. Soils are characterized by sandy volcanic ash and pumice on a buried soil over glacial till. The elevations range between 5200’ – 5800’. The average annual precipitation measures in the 15” – 30” range.

There are known weed sites in or adjacent to the project area. Although the actual winter use of the trails per se should not pose a concern, the construction of those trails may. The weeds are located at these sites:

1. *Road 4612 (Wednesdays trail).* Three relatively small populations of spotted knapweed were found in 2006, all comprising less than 60 plants each, in sections 22 and 23.
2. *Grooming shed, junction of roads 4615 and 4615-040.* One plant of spotted knapweed was found in front of the door in 2006.
3. *Near Road 4615/4615-070 junction.* Two plants of Dalmation toadflax were found in 2004, pulled, and were not found in 2005.
4. *Near junction of Roads 4615 and 4615-160.* Twenty plants of spotted knapweed were found in 2006.

5. Near junction of Hwy 46 and Road 4615 (entrance to Meissner Sno-Park). In 2002, about 40 spotted knapweed plants were found; this site is in an herbicide treatment zone and is assumed to be under control, although no follow-up checks have been recorded.

Noxious Weed 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.

***Vectors** (if contained in project proposal) ranked in order of weed introduction risk:

1. Heavy equipment (implied ground disturbance)
2. Importing soil/cinders
3. OHVs
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

While generally speaking the project area is relatively weed-free, a risk ranking of HIGH is appropriate for this project because heavy equipment will be brought into the area to construct the new trails, lodge, parking lot, etc. (which brings a risk of importing weed seeds or parts with it), there are known weed populations at and near the project area, and the equipment may intersect the populations. Following the mitigations below will address this issue and will reduce, but not eliminate, the risk.

Effects on Noxious Weed Introduction and Spread

No Action

No effects have been identified, because no new activity would occur.

Both Action Alternatives (#'s 2 and 3)

Direct Effects: It is possible that the heavy equipment brought to the site will carry in noxious weed seeds or parts and introduce them to the site. Making sure that the equipment is cleaned prior to project entry (mitigation #1) reduces this concern, but does not eliminate the risk.

Indirect Effects: With the increased size of the parking area, use of the sno-park in the summer (snow-free) season may increase, which in turn increases the possibility of weeds being brought there on the tires or undercarriages of vehicles, which in turn could spread via off-highway vehicles, bicycles, or passenger vehicles elsewhere. To help mitigate this concern, noxious weed information should be posted at the site in the summer, in order to raise the awareness level of the general public that may be using the site. These mitigations will reduce the concern, but not eliminate it.

Cumulative effects: This project, in conjunction with the nearby proposed Wanoga play area, Wanoga mountain bike trails and event course, and the Kapka Butte sno-park, will invite more vehicles (motorized

and non-motorized) into the area. Because of this, it presents an overall increased risk of weeds being spread into these areas.

Comparison of Alternatives

From a weed standpoint, the No Action alternative provides the most protection from noxious weeds being introduced to the project area, because no heavy equipment would be brought in to work on the site. Next most attractive is Alternative 3, in which two less kilometers of trails are proposed than Alternative 2, thereby decreasing the chances of weeds being spread to new sites via construction equipment. Least attractive is Alternative 2 (Proposed Action), which has more and larger construction planned; the chances of new weed sites developing there would be higher.

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. Two of those standards specifically address prevention of weed introductions (#'s 1 and 2, see Appendix B) into projects of the type that the Meissner Nordic Expansion project represents. These standards obligate the Forest Service to incorporate weed prevention into its planning documents and implementation phase. Chapter 2 lists prevention measures for this project.

Noxious and Exotic Weeds of Concern for the Project Area

Spotted knapweed, *Centaurea bierbersteinii*, is a very invasive plant that grows along most major highways in Central Oregon**.** It is a perennial forb in the sunflower family that lives for 3-5 years. It is very competitive on disturbed dry to mesic sites because it is able to germinate in a wide range of conditions and it grows early in spring before many native plants. Seeds may be dispersed on animals and humans, and by being caught up in vehicles. Distribution over large areas is linked to transportation systems. Known sites along Highway 46 are, among other places, currently being treated under the Deschutes National Forest Noxious Weed Control Environmental Assessment (1998).

Dalmatian toadflax (*Linaria dalmatica*) looks like bright yellow snapdragons with leathery leaves clasping the stem and grows easily in dry rangeland sites, gravel pits, and along roadsides. It is a perennial plant and stands 2-4 feet tall. One plant can produce up to 500,000 seeds per year, and they remain viable in the soil for up to 10 years. Pulling this plant will usually result in more plants sprouting from its root system, unless all root parts are removed from the soil, which is often difficult to do.

Water Resources / Fisheries

The project area is mostly devoid of surface water with the exception of an intermittent channel on the western side of the ski area (Sections 20 and 21). This channel has no surface connection to perennial water, lakes, large wetlands, or fish-bearing streams. There are riparian areas adjacent to the channel near the headwaters.

There are no fish-bearing streams or lakes, nor perennial stream channels within the project area. The intermittent channel within the project area has no surface connection to perennial water, lakes, large wetlands, or fish-bearing streams. The Riparian Reserve widths for intermittent channels per the NWFP Record of Decision is 100 feet from both sides of the banks of the channel.

Northwest Forest Plan (NWFP)

Standard and Guideline RM-2: Adjust dispersed and developed recreation practices that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective, eliminate the practice or occupancy.

Deschutes Land and Resource Management Plan (LRMP)

Standard and Guideline RP-17: Roads and trails will be at the lowest density, which meets long-term resource needs. Where existing roads or trails are inhibiting the achievement of fisheries or water quality objectives, measures shall be taken to eliminate the problem.

Standard and Guideline RP-22: Road and trail maintenance shall be performed on a frequency necessary to maintain drainage efficiency at all runoff control and drainage structures (dips and culverts).

Mitigation Measure -- T-21 Servicing and Refueling of Equipment: Any gas-powered or hydraulic equipment used in the construction of trails shall be refueled or refilled outside of streams and riparian areas.

Effects to Water Resources / Fisheries

Alternative 1 (No Action): Direct and Indirect Effects: There would be no effect to fish, water, or riparian resources as no management activities would occur.

Alternatives 2 and 3: Direct, Indirect, and Cumulative Effects: There is no new trail construction proposed within the Riparian Reserve of the intermittent channel. There would be no adverse direct, indirect, or cumulative effects to water, fisheries, or riparian resources. The effects are the same for either alternative.

Aquatic Conservation Strategy Objectives: The proposed activities under Alternative 2 and 3 meet or do not prevent attainment of the 9 Aquatic Conservation Strategy objectives listed on page B-11 of the Record of Decision for the NWFP.

The action alternatives are consistent with the Standards and Guidelines of the NWFP and the LRMP. Fisheries and water quality objectives are met and the ACS objectives are met or the actions do not prevent attainment of the objectives.

Soils

The Deschutes Land and Resource Management Plan (LRMP) specifies that management activities are prescribed to promote maintenance or enhancement of soil productivity by leaving a minimum of 80 percent of an activity area, in a condition of acceptable productivity potential following land management activities (Forest Plan page 4-70, SL-1 and SL-3). This is accomplished by following Forest-wide standards and guidelines to ensure that soils are managed to provide sustained yields of managed vegetation without impairment of the productivity of the land. Standard and Guideline (SL-4) directs the use of rehabilitation measures when the cumulative impacts of management activities are expected to cause damage exceeding soil quality standards and guidelines on more than 20 % of an activity area. Standard and Guideline (SL-5) limits the use of mechanical equipment in sensitive soil areas. Guideline (SL-6) provides ground cover objectives to minimize soil erosion by water and wind. Management Allocation Areas MA-8, MA-9, and MA-12 do not contain specific standards and guidelines for the soil resource.

The Regional supplement to the Forest Service Manual (FSM 2520, R-6 Supplement No. 2500-98-1) provides policy for planning and implementing management practices which maintain or improve soil quality. This Regional guidance and is consistent with LRMP standards and guidelines.

Management direction for the soil resource applies to lands where vegetation and water resource management are the principle objectives. These soil quality standards and guidelines do not apply to intensively developed sites such as developed recreation facilities because they could not be constructed to result in limited disturbance below specific thresholds. Soils dedicated to management facilities remove land from production and preclude other uses of the soil for as long as these facilities remain in use.

Scope of the Analysis

For this project proposal, the discussion of soil effects will be focused on the proposed locations of new facilities and upgrades to existing facilities needed to accommodate recreation use objectives. A qualitative assessment of potential soil impacts was conducted to ensure that acceptable soil productivity is maintained for the growth of desired vegetation on undeveloped portions of the Meissner Sno-Park area.

The primary objective for the soil resource is to plan and conduct management activities so that on-site loss of soil productivity is minimized on lands which are not officially dedicated to permanent facilities necessary to achieve other land management objectives. The analysis also considered the effectiveness and probable success in project design and implementation of Best Management Practices (BMPs) and erosion control measures that would be implemented to minimize or reduce potentially adverse impacts to soils in adjacent areas.

Landscape Characteristics and Existing Condition of the Soil Resource

The landscape is generally characterized by gentle-to-moderately sloping glacial uplands, ground moraines and broad benches with slopes that range from 0 to 40 percent. Less than five (5) percent of the planning area is comprised of relatively small buttes and cinder cones (25 to 70 percent slopes) that rise above the glacial uplands and outwash plains. Elevation ranges from about 5,150 feet within the valley bottomland in the eastern portion of the planning area to approximately 5,873 feet on top of a cinder cone in the central portion. Mean annual precipitation averages between 12 to 15 inches. All landforms and soils within the planned activity areas have been influenced by glacial outwash flooding that once occurred to the west of the project area. The landscape has been covered with a moderately thick layer of volcanic ash and pumice deposits. Soil surface layers consist of non-cohesive (loose), sandy-textured materials with very little structural development due to the young geologic age of the volcanic parent materials. Underlying soils have developed from glacial till deposits that are buried at depths that range from approximately 20 to 40 inches. These glacial materials consist of sands and gravels that have been reworked by running water from the melting of mountain glaciers. Dominant soils are deep (greater than 40 inches) with moderate to high productivity potential for the growth of vegetation. The proposed activity areas meet criteria for land suitability that would allow them to be regenerated or resist irreversible resource damage.

These volcanic ash-influenced soils have sandy textures with high infiltration and percolation rates that account for low amounts of overland flow. Most of the water yielded from these lands is delivered to streams as deep seepage and subsurface flows. Surface erosion by water is generally not a concern because representative soils have low-to-moderate erosion hazards on gentle to moderately sloping landforms which are naturally stable. At the present time, soils are adequately protected by vegetation and organic litter layers to control erosion rates within tolerable limits. Dominant soil types are sufficiently resistant to erosion to permit limited and temporary exposure of bare soil. There are no perennial streams or other water bodies within the project area.

Soils derived from volcanic ash and pumice deposits have naturally low bulk densities and low compaction potential. However, mechanical disturbances can still reduce soil porosity to levels that limit vegetative growth, especially where there is a lack of woody debris and surface organic matter to help cushion the weight distribution of ground-based equipment. The sandy-textured surface layers are also easily displaced by equipment operations, especially during dry moisture conditions. The maneuvering of equipment is most likely to cause soil displacement damage on the steeper landforms.

Based on criteria for identifying sensitive soils to management (Deschutes LRMP, Appendix 14, Objective 5), sensitive soils within the project area include soils on landtypes with slopes greater than 30 percent gradient. There are no potentially wet soils with seasonally high water tables or soils with a high hazard for surface erosion that would require special mitigation.

The current condition of the soil resource has mainly been influenced by the transportation system, past logging facilities (i.e., skid trails, log landings) and existing recreation facilities. Most project-related

impacts to soils occurred on and adjacent to intensively developed sites (e.g., roads, recreation facilities) and heavy use areas (e.g., logging facilities) where mechanical disturbances removed vegetative cover, displaced organic surface layers, or compacted soil surface layers. Soils dedicated to management facilities typically have disturbed properties that remove land from production for as long as the facility remains in use or until their functions have been served and disturbed sites are restored back to a productive capacity. Surface erosion on these sites will continue to exceed the natural rates of undisturbed soils for as long as bare surface soils are exposed to the elements of erosion. Frost heaving and freeze-thaw cycles have gradually restored soil porosity in areas with slight to moderately compacted layers near the ground surface. Other factors that have helped the recovery process include root penetration, rodent activity, wetting and drying cycles, and surface organic matter. The establishment of vegetative ground cover and the accumulation of litter and organic matter continue to improve areas of displaced surface soil.

Adequate amounts of coarse woody debris and surface organic matter currently exist to protect mineral soil from erosion and maintain the soils ability to retain moisture and provide both short and long-term nutrient supplies for the growth of vegetation.

Resource protection measures and erosion-control Best Management practices will be incorporated into the project design to avoid or minimize erosion problems on or adjacent to disturbed sites (Refer to Chapter 2)

Direct, Indirect, and Cumulative Effects to the Soil Resource

Direct effects occur at essentially the same time and place as the actions that cause soil disturbance, such as soil displacement and compaction caused by equipment operations. Indirect effects occur sometime after or some distance away from the initial disturbance, such as increased runoff and downslope erosion from previously compacted areas. Cumulative effects include all past, present, and reasonably foreseeable actions that cause soil disturbance within the same activity areas.

Alternative 1 (No action)

Under this alternative, no additional land would be removed from production to build new structures and upgrades to existing recreation facilities. No trees or other vegetation would be cleared to widen existing ski trails and expand the existing parking area.

The extent of exposed mineral soil would not increase from construction activities, so erosion control measures would not be necessary. Surface erosion on existing roads and other management facilities would continue at current levels. Erosion rates would not change appreciably unless intense wildfires occur in dense stands of trees within the planning area.

Cumulative Effects

The cumulative effects of past and current soil disturbances were previously described for the current condition.

The amount of coarse woody debris and surface organic matter will gradually increase over time. In the long-term (greater than 5 years), the accumulation of down wood and forest litter would increase the risk for wild land fires.

Foreseeable future actions are assumed to occur as planned in the schedule of projects for the Deschutes National Forest. No out-year timber sales or fuel reduction projects are currently scheduled within the Meissner Sno-Park planning area. The only foreseeable future actions include continued recreation use and standard road maintenance. Existing recreation facilities and surrounding areas would continue to be maintained to prevent or minimize soil erosion problems and potential impacts to other resource values. Road maintenance activities would reduce accelerated erosion rates where improvements are necessary to correct road drainage problems. Therefore, the combined effects of current and future activities would maintain acceptable soil productivity for the growth of desired vegetation on undeveloped portions of the planning area.

Alternatives 2 and 3

Both action alternatives would implement the proposed actions described in Chapter 2. The primary difference is the overall extent of new soil disturbance associated with the expansion and development of additional facilities. Alternative 2 would build approximately 9.7 miles of new trail, widen about 30.7 miles of existing trail, develop a one (1) acre staging area, a 2.7 acre terrain park, a 2700 square foot shelter, and increase the size of the existing parking area from 1.3 acres to 4.9 acres. Alternative 3 would build approximately 7.8 miles of new trail, widen about 21.6 miles of existing trail, develop a one (1) acre staging area, a 2.7 acre terrain park, a 1500 square foot shelter, and increase the size of the existing parking area from 1.3 acres to 1.7 acres. The total number of acres removed from production is predicted to be approximately 20.0 acres under Alternative 2 and 16.2 acres under Alternative 3 or a difference of 3.8 acres of land.

The anticipated disturbance associated with clearing operations for new ski trails and widening existing trails would be inconsequential. Vegetation would be cleared 18 feet in width for new trail locations and existing trails would be widened from 13 feet to 18 feet. The emphasis during clearing is on maximizing the maintenance of low growing vegetation and minimizing mechanical disturbance of the soil. Most of this work would be accomplished manually using chainsaws and hand tools. The primary effects would be a temporary reduction in existing vegetation. These non-mechanical treatments would produce only localized areas of exposed mineral soil that would not qualify as a detrimental condition (FSM 2520, R-6 Supplement). Recreation use on completed trails would occur over a compacted snow base that would effectively prevent detrimental soil compaction. Felled trees and other vegetation would be retained on the ground to provide surface cover and a source of nutrients as these organic materials gradually decompose. This would have beneficial effects to site productivity by improving the soils ability to resist surface erosion and providing organic matter for humus development in mineral soil.

A small tracked excavator would be used to remove some of the larger stumps, to position logs for erosion control, and to construct banked curves on downhill corners of steep areas. Mechanical disturbances would displace topsoil in localized areas, but compaction is not a concern due to the limited amount of machine traffic. Although some trail segments would likely cross steep portions of some landtypes, the project design would include appropriate Best Management Practices (BMPs) to control erosion during construction activities (General Water Quality Best Management Practices, Pacific Northwest Region, 1988). These BMPs are tiered to the Soil and Water Conservation Practices Handbook (FSH 2509.22) which contain erosion control measures that have proven effective in protecting and maintaining the soil resource. Mitigation measures for erosion control would likely include various techniques for providing soil cover and holding and/or trapping soils on slopes such as: lopping and scattering slash, placement of trees in close contact with the ground and anchored behind tree stumps, and promoting revegetation with shrub species and other low growing plants. The types and locations of soil disturbance are not expected to cause any indirect, off-site impacts to soils in adjacent areas, such as loss or burial of productive surface soils. There is low risk for mechanical disturbances to cause soil mass failures (landslides) due to the inherent stability of dominant soils and the lack of seasonally wet soils on steep slopes.

A staging area is proposed in close proximity to the parking area. This area would measure approximately 150 by 300 feet (about one acre) on flat to gradually sloping terrain. A ski trail would circle the perimeter of the staging area. The area is already partially cleared, so it is anticipated that only a small number of trees may need to be cleared by hand to provide ingress and egress to the trail system and parking area. These activities would produce only small, localized areas of exposed mineral soil that would not qualify as a detrimental soil condition.

A 2.7 acre terrain park is proposed to improve and develop ski skills. The location of this facility has a varying degree of slope from five to 20 percent with a nearly flat area at the bottom of a hill. The terrain features will include banked slopes and turns, small bumps, moguls and jumps that will be created along three paths through the park. These features will require earthwork using a tracked excavator to move

soil and shape the terrain. None of these activities would occur in areas with sensitive soils. Mechanical disturbances would detrimentally disturb soil properties where topsoil displacement occurs in areas greater than 100 square feet, which is at least 5 feet in width (FSM 2520, R-6 Supplement). Although this would adversely change the natural capability of soils in such areas, soil quality standards are not applicable to intensively developed sites such as developed recreation facilities. As with the other sites where mechanical disturbance would take place, appropriate Best Management Practices (BMPs) would be implemented to control erosion during and following construction activities.

A warming shelter and toilet facilities would be constructed to accommodate snow park users. Construction activities inevitably disturb soil properties and alter soil-hydrologic function by removing the natural vegetation, displacing the organic topsoil, and compacting the subsoil materials. Consequently, these physical disturbances increase the potential for surface runoff and accelerated erosion. Excavation work exposes subsoil that is often used for backfill around the foundation perimeter and for grading the terrain around the facility. The greatest potential for accelerated soil erosion occurs during the construction phase when the largest area of disturbed soil is exposed to precipitation events. Once completed, the area of the footprint covered by the structure is no longer susceptible to erosion. However, the surrounding perimeter of exposed soil would require temporary or permanent erosion control measures to provide surface cover on disturbed soils. Appropriate BMPs would be implemented to control erosion during construction activities and prevent soil materials from being transported off-site.

The parking lot expansion would temporarily expose the largest area of disturbed soil during grading operations. Accelerated erosion rates are greatest within the first two years following disturbance. Temporary erosion-control BMPs would be applied to prevent off-site impacts to soils in adjacent areas, such as loss or burial of productive surface soils. The parking lot would be paved, so there is no potential for long-term erosion problems following the completion of this facility.

Cumulative Effects

The combined effects of current disturbances and the proposed management activities were previously addressed under current conditions and the direct and indirect effects of implementing the action alternatives.

Felled trees and other vegetation would be retained on the ground following clearing operations. Therefore, the amount of down woody debris and surface organic matter would increase slightly over existing levels. In the long-term (greater than 5 years), the accumulation of additional down wood and forest litter would increase the fire hazard.

Future management activities are assumed to occur as planned in the schedule of projects for the Deschutes National Forest. No out-year timber sales or fuel reduction projects are currently scheduled within the Meissner Sno-Park planning area. The only foreseeable future actions include continued recreation use and standard road maintenance. As previously addressed under cumulative effects for Alternative 1, there are no soil-related concerns associated with the combined effects of these future activities.

Management Consistency

The primary objective for the soil resource is to plan and conduct management activities so that on-site loss of soil productivity is minimized on lands which are not officially dedicated to permanent facilities necessary to achieve other land management objectives.

Management direction for the soil resource applies to lands where vegetation and water resource management are the principle objectives. Soil quality standards and guidelines do not apply to intensively developed sites such as mines, developed recreation facilities, and administrative sites (FSM 2520, R-6 Supplement No. 2500-98-1).

The action alternatives would cause some new soil disturbances in undeveloped portions of the planning area. The planned locations for construction activities would not disturb sensitive soils with a high

erosion hazard or potentially wet soils that would require special mitigation. Soils are sufficiently resistant to erosion to permit limited and temporary exposure of bare soil during development or use. As previously discussed under direct and indirect effects, project design would include appropriate Best Management Practices (BMPs) to control surface erosion during and following construction activities. These BMPs are tiered to the Soil and Water Conservation Practices Handbook (FSH 2509.22) which contain erosion control measures that have proven effective in protecting and maintaining soil and water resource values. Potential soil loss is not expected to exceed tolerable limits because various techniques would be implemented to provide effective ground cover that would reduce the potential for soil erosion. The types and locations of soil disturbance are not expected to cause any indirect, off-site impacts to soils in adjacent areas, such as loss or burial of productive surface soils.

Neither action alternative is expected to create any impacts that would cause irreversible damage to soil productivity. There is low risk for mechanical disturbances to cause soil mass failures (landslides) due to the inherent stability of dominant landtypes and the lack of seasonally wet soils on steep slopes. Careful planning and the application of erosion-control Best Management practices would be used to minimize erosion problems on or adjacent to disturbed sites and prevent irreversible losses of the soil resource.

The development and use of temporary roads and logging facilities is considered an irretrievable loss of soil productivity until their functions have been served and disturbed sites are returned back to a productive capacity.

Scenery

The project area for the Meissner EA is located approximately 10 miles southwest of Bend on the Bend/Fort Rock Ranger District of the Deschutes National Forest. Areas of concern for scenic views are along the Cascade Lakes Scenic Byway (Highway 46) that is the south boundary of the project area. The area adjacent to Highway 46 is within the Scenic Views Management Area and is classified as Partial Retention Foreground and Middleground classifications (Medium Integrity for Scenery Management System objectives).

The project area is located within the high intensity summer and winter recreation activity areas of the Cascade Lakes Recreation Area. There are numerous mountain biking, cross country skiing and snowmobile trails and trailheads located nearby. The Cascade Lakes National Scenic Byway is the scenic travel corridor that is brings visitors to the area's recreational sites and scenic view areas. The intrinsic values to be protected along the scenic byway are natural, scenic, and recreational qualities. Other activities in this area include wildlife-viewing, native plants, hiking, road biking, and sight-seeing.

Currently, scenic views from this portion of the Cascade Lakes Scenic Byway are of a mixed conifer forest. Views to the existing Nordic skiing parking area and trailhead are screened by the existing vegetation.

Scenic Values

Scenic values along the Cascade Lakes Scenic Byway are considered high. Scenic values are often based upon local knowledge of an area's unique characteristics and how people relate to a particular landscape or setting. Measuring these values is often subjective and communicated through the overall quality of the visitor experience. The key to realizing these values is to understand the traditions and connections visitors have developed over time with a certain place.

Visitors often have definite expectations of scenic views and other sensory experiences. These expectations are mainly based upon aesthetics and can be expressed through reactions to changes in the landscape or to patterns of land use. Visible and perceptible changes in noise levels, intensity of illumination, new building structures, surface changes such as paving or concrete, cut and fill grade changes, and removal of native vegetation are especially noticeable in developed areas surrounded by a forest setting.

Recent population changes and growth of development in Bend and Sunriver have brought more pressure and greater potential for disturbance to scenic quality and negative impacts to visitor recreation experiences in semi-primitive and primitive settings. Light pollution from adjacent urban areas and higher density recreation activities have all occurred in recent years to impact the visitor's recreation experience in other areas on the Forest.

Scenery management Objectives

Scenery Management 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. When repetition is designed to be accurate and well placed, the deviation may blend so well that change is not evident.

Desired Future Condition

The desired future condition is to provide high quality scenery representing the natural character of central Oregon. Parking facilities, structures, and other recreational facilities are to blend with the natural landscape and to remain subordinate to views from major travel corridors, especially scenic byways with national designations for scenic, natural, and recreational values. Effective natural screens and distances from roads are to be such that the view from the road appears natural.

Alternative 1 (No Action)

Direct and Indirect Effects: There would be no change to existing use. The parking area would continue to provide parking for approximately 60 vehicles. During busy periods, overflow parking would continue on either side of Forest Road 4615 and along Highway 46, detracting from forest views. The Sparky Hazard Tree Reduction Project would remove hazard trees within the Scenic Views designation that is along Highway 46 that extends approximately 500 feet into the Forest. There is the possibility of open views of the parking area exposed to visitors traveling on the Cascade Lakes Scenic Byway adjacent to the project area.

Alternative 2 (Proposed Action)

Direct and Indirect Effects: The resulting short-term effects of the project would not be significantly noticeable to the viewer from the Cascade Lakes Scenic Byway if the existing vegetation screen is maintained at least 200 feet from the road. The expansion of the parking area would occur toward the Scenic Byway and increase parking from 60 vehicles to 180 vehicles. The expansion area would occur to the south of the existing and be approximately 250 feet from the Cascade Lakes Scenic Byway. Existing stands between the highway and the expanded parking area would need to remain as a visual and audible buffer. Visitors to the Meissner Sno-Park are expecting a wilderness-like experience so the buffer from noise and views to the highway are as important from the sno-park as from the highway. With an effective vegetation screen and well-designed parking area, this alternative would meet the goal of M-9 (Scenic Views) of providing high quality scenery representing the natural character of Central Oregon.

Cumulative Effects: Along this part of the Cascade Lakes Scenic Byway, views to the parking area could potentially be more open in the future. Visitor safety would be improved with the removal of hazard trees and excess fuels. Removal of hazard trees from the existing vegetation screen which provides a buffer

between the Cascade Lakes Scenic Byway and the Meissner Sno-Park parking area would be noticeable over the short-term and become less noticeable over the long-term assuming existing trees would regenerate or additional new trees would be planted to fill in any gaps resulting from tree removal.

Alternative 3

Direct, Indirect and Cumulative Effects: Effects would be similar to Alternative 2 due to the planned developments for the Sno-Park parking area, trails, and facilities. The existing parking area would double in size with its expansion from 60 vehicles to 120 vehicles. The resulting parking area would be approximately 250 feet away from the Cascade Lakes Scenic Byway.

Cultural Resources

The prefield review was conducted, including the review of historic inventory maps, cadastral survey notes, previous cultural resource survey maps. Previous cultural resource survey reports were also reviewed. The field investigation involved survey of areas proposed for trails, parking expansion, shelter construction, and terrain park.

No cultural resources were located in areas that would be impacted by the project. There are no cultural properties within the project area that are eligible for National Register of Historic Places.

This project complies with Section 106 of the National Historic Preservation Act, under the terms of the 2004 Programmatic Agreement for the State of Oregon. No historic properties will be affected by implementation of either action alternative.

Other Disclosures

Wetlands and Floodplains

Both action alternatives are consistent with Executive orders 11988 and 11990, as there would be no adverse effects to wetlands or floodplains.

Civil Rights and Environmental Justice

Civil Rights legislation and Executive Order 12898 (Environmental Justice) direct an analysis of the proposed alternatives as they relate to specific subsets of the American population. The subsets of the general population include ethnic minorities, people with disabilities, and low-income groups. The project is not located in a minority community and would not affect residents of low or moderate income.

This project will not affect any specific subset of the American population at a disproportionately higher rate than others.

In addition, the effects of this project on the social context of these protected groups are within those described in the Deschutes National Forest Plan. The benefits and risks associated with implementation of the proposed action are provided to all members of the public. Therefore, the project would not pose disproportionately high or adverse effects to minority communities or to low income groups.

Prime Lands (Farm, Range, and Forest)

There are no lands within the boundaries of the Deschutes National Forest that meet the definition of prime farmland, or are considered prime farmland as discussed in the Final Environmental Impact Statement, Deschutes National Forest Land and Resource Management Plan. National Forest Land is generally not considered "prime" forestland. This project, therefore, would not affect prime lands.

Inventoried Roadless Areas and Wilderness

The project area does not include any Inventoried Roadless Areas or Wilderness. There will be no effect to these designated areas outside of the Meissner winter trails area.

CHAPTER 4 CONSULTATION WITH OTHERS

Public Participation

During the initial scoping, 82 responses with comments and questions were received. Responses varied from those who wanted more clarification to specific suggestions for project implementation. Comments were used to help develop Alternative 3.

This section will be updated following the 30-day comment period.

Interdisciplinary Team

Marv Lang – Interdisciplinary Team Leader & Recreation Specialist
David Frantz/Beth Peer – Writer/Editors
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Rod Jorgensen – Soils Scientist
Charmane Powers – Botanist
Janine McFarland – Archaeologist
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