

Environmental Assessment

For

Lift 21 at Mt. Hood Meadows Ski Resort

**Hood River Ranger District
Mt. Hood National Forest
Hood River County, Oregon**

July 2001

Chapter 1 Purpose and Need for Action

Introduction

This chapter introduces a site-specific proposal for Lift 21 (sometimes referred to as Lift 21A) that was conceptually approved in the Record of Decision (ROD) for the Mt. Hood Meadows Ski Area Master Plan published in 1997. Discussed in this chapter are the following subject areas:

Setting and scope for this proposed action.

Purpose and need for Lift 21, and the decision that needs to be made by the Responsible Official about this Lift.

Summarization of the scoping process and identification of environmental and/or social concerns that were considered during scoping for the Lift 21 proposal.

In January 1997, the Mt. Hood National Forest Supervisor issued a Record of Decision (ROD) in which Alternative S4 was selected as the Agency's Preferred Alternative, with minor modifications, as the new 10-20 year Master Plan for MHM. This decision, among other things, conceptually approves the number and approximate location of ski lifts, including Lift 21. The ROD also stipulates that *"Future NEPA analysis will be tiered to this Decision and Final SEIS and the public will have the opportunity to participate"* (ROD @ p.5).

Purpose and Need for the Proposed Action

The Mt. Hood National Forest proposes to approve the construction of a new detachable quad chairlift at the Mt. Hood Meadows Ski Resort, called Lift 21. The proposal is described in greater detail below as "Alternative 2".

The underlying needs for this action are (1) relief for the crowded conditions in the Buttercup/Red areas where beginner and novice skiers and snowboarders are presently restricted, and (2) access to under-utilized ski terrain by the same users at high altitude above tree line with open spaces and panoramic views. Mt. Hood Meadows has seen a 71% increase in beginner and novice snow riders since 1995. Further information on these needs is given below in the no action alternative, "Alternative 1".

The Mt. Hood National Forest expects to achieve a number of purposes including heading toward the Desired Future Condition (DFC) established in the 1997 ROD and Master Plan, to "improve the balance of skiing terrain through new chair and surface lifts and additional terrain." ROD, page 8. The extent to which the proposal meets this and other purposes is described below in Chapter 3, as the effects of Alternative 2.

Lift 21 would help achieve this desired condition by better serving the Red Lift terrain and make the high, open terrain next to Texas Trail accessible to novice skiers and snowboard riders. That terrain is inaccessible to novices because the slopes from the Daisy and Cascade Express lifts are too

difficult for them. Lift 21 would attract more skiers/riders to the south side of the ski area, improving user dispersal and reducing waiting time at lifts like Buttercup. The new detachable quad chair would also be much easier for novice skiers to load and unload, and it would be useful for handicapped skiers as well.

Proposed Action

The proposed action in this assessment is the placement of Lift 21 and the construction of an estimated 1080 feet of temporary road and the reconstruction of an estimated 2190' of temporary road to install its top terminal. A power line providing electricity to the upper terminal of this Lift will also be analyzed for environmental effects. The utility line would be buried within existing and temporary road clearings.

Relevant Plans

This analysis is tiered to two plans applicable to the proposed action: the Mt. Hood Meadows Ski Area Master Plan/Access Road FSEIS (12/96) and the Mt. Hood National Forest Land and Resource Management Plan as amended by the 1994 Record of Decision for the Northwest Forest Plan. Another planning tool relevant to this proposal is the Mt. Hood Meadows Landscape Analysis and Design (LAD, 4/12/98).

The Mt. Hood National Forest Land and Resource Management Plan designates the Mt. Hood Ski Area as A11 - Winter Recreation Area. The goal of this land allocation is: *"Recreation facilities will provide areas for high quality winter recreation (and associated summer) opportunities including: downhill skiing, snowmobiling, and snowplay within a natural appearing forest environment"* (MHFP @ P. Four - 190). The proposed lift is consistent with the Land and Resource Management Plan.

Mt. Hood Meadows Ski Area Master Plan

The approved Master Plan authorizes a number of actions contingent *"upon additional site specific environmental analysis pursuant to NEPA requirements"* (ROD @ p.5). Among the actions authorized is the construction of 3 new chairlifts, one of which is Lift 21.

The ROD also references Riparian Reserves, noting *"riparian reserves need to be maintained through preservation of existing forested and riparian vegetation to the extent possible"* (ROD @ p.9). The Deciding Official, recognizing that vegetation disturbance and clearing within riparian reserves would be necessary to accommodate facilities expansion, disclosed that a maximum limit of 9.5 acres (excluding Lift 15 and its associated ski trails) would be impacted (ROD @ p.10).

Mt. Hood Meadows Landscape Analysis and Design (LAD)

The LAD takes a closer look at the effects and implications of implementing the 1997 Master Plan, by considering all components approved in the Master Plan at one time, but it was not a site-specific assessment. While the LAD process was originally developed for larger scale areas it is adaptable to smaller scale areas like the MHM permit area. Its function remains the same, i.e., to provide an understanding of function and interactions between natural processes and human flows/activities.

Issues to be Addressed in This EA

Scoping with other agencies and interested parties was conducted prior to and during preparation of this EA. Public notification of Lift 21 planning effort first occurred in the Spring 2000 edition of Sprouts, a quarterly newsletter published by the Mt. Hood National Forest and mailed to approximately 500 addresses.

In March 2000, a scoping letter, which identified a proposed action, was mailed to approximately 30 individuals, agencies and organizations. Ten responses to this letter were received.

The Forest Service hosted two field trips for interested parties, one in the winter of 2000, and one on September 6, 2000.

The following summarizes public concerns (in their terms) identified through this scoping effort, and describes how these concerns are addressed:

High Elevation Plant Communities

The establishment of the Mt. Hood Meadows Ski Area may have resulted in the degradation and loss of high elevation plant communities of krummholtz ridges, whitebark pine and alpine pincushion vegetation. The upper reach of Lift 21 would be situated in these communities. What effect would the proposed construction of Lift 21 have on these communities? How much of this high elevation habitat has been entered since the establishment of the Mt. Hood Meadows Ski Area in 1967? What are the cumulative effects to these high elevation communities? Included in this discussion should be the effects of glading, clearing of ski runs, widening of ski runs, power line construction, and road construction within these high elevation habitats.

Hydrology

The cutting of trees within the permit boundary may alter the hydrology within the permit area by increasing water run-off in the spring, thus lessening water run-off during the summer months. Lift 21 would require the cutting of an estimated .2 acres of trees? What effects would the cutting of .2 acres of trees have on snowmelt and stream flows within the permit area and the 5th field watershed boundaries? Through past, present, and foreseeable tree clearing activities and other actions associated with the operations of Mt. Hood Meadows, such as grooming, and snow farming, what are the cumulative hydrological effects to streams within the Mt. Hood Meadows Ski Area and the 5th field watershed boundary? Has the "threshold-of-concern" been exceeded, or will it be exceeded, within the permit boundary?

Other Resources

What are the cumulative impacts on anadromous fish species, particularly to fish below Sahalie Falls as a result of tree felling within the Mt. Hood Meadows permit area? In addition to hydrological effects, tree cutting alters the landscape affecting a variety of other resources. As previously noted, Lift 21 involves the felling of approximately .2 acres of trees (trees are to remain on site). What effect does the felling of these trees have on forest health, riparian area functionality, biodiversity of plant communities, wildlife species habitat and wildlife species distribution, soil compaction and

erosion, and visual quality? What are the cumulative effects of landscape alteration within the Mt. Hood Permit Area on these resources?

To some extent, these concerns generally distinguish between Mt. Hood Meadows activities that occur above tree line (in krummholtz ridges, whitebark pine and alpine pincushion vegetation areas), and those activities that occur below tree line. Where appropriate, the impact zone analyzed for each resource makes a distinction between these two environmental settings. For additional responses to these concerns the reader is referred to Chapter 4, section 4.4 of this Environmental Assessment (EA).

Decisions That Must Be Made

The District Ranger for the Hood River Ranger District must decide:

- Whether she should approve, or disapprove any of the alternatives associated with the proposed construction of Lift 21 at the location(s) cited in this EA.
- What mitigation and/or monitoring measures should be implemented to meet the Standards and Guidelines of the Mt. Hood National Forest Land and Resource Management Plan as amended by the Northwest Forest Plan if Lift 21 is authorized.

Chapter 2 Alternatives

Introduction

The 1997 Master Plan, from which the proposed lift concept stems, contains implementing direction in Appendix A. The various required actions from Master Plan Appendix A that are relevant to this project are displayed in Appendix A of this assessment. This relevant direction is incorporated into the plans and proposed action by Mt. Hood Meadows. The ID Team has included comments about meeting the direction for some of the elements.

Alternatives Considered in Detail

Alternative 1 – No Action Alternative

With a no action alternative, the District would deny permission for Mt. Hood Meadows to construct a new chairlift known as Lift 21. The higher elevation beginner/novice ski terrain would be unchanged, and remain inaccessible to beginners and novices because getting there from the existing Cascade Express lift means negotiating more difficult intermediate level slopes. Beginners, then, cannot experience the thrilling panoramic views afforded above tree line. Beginners and novices would continue to have the limited (crowded) terrain acreage available around the Buttercup and Red chairlifts where the 71% increase of beginning clients is causing an increased risk of collisions between users and where such “uncomfortable space” can adversely affect the initial experience of the new users – they might be afraid to come back and try it again.

Alternative 2 – Proposed Action Alternative

The proposed action is construction of a high-speed detachable quad chairlift to serve novice ski terrain within the Mt. Hood Meadows permit area. The lower terminal of this nearly 5300 foot-long lift would be located immediately off an existing service road, and just above the Red chairlift's bottom terminal. The proposed lift alignment goes toward the Badlands trail, parallel to the Daisy lift. The top drive terminal would be located in a swale on the ridge overlooking the White River. Some chairs would be removed from the haul rope during bad weather and stored on hangers at the bottom terminal.

The estimated 18 lift tower foundations located outside of riparian reserves, that transect this lift-line, would be dug using a backhoe(s) and/or walking backhoe. The 2 lift tower foundations located within riparian reserves would be dug using hand tools or a walking backhoe. All concrete used for the terminal and tower foundations, and the towers themselves, would be flown in by helicopter. No wetlands would be affected by tower or terminal placements. (Reference 11/3/00 letter from Corps of Engineers filed in Appendix B).

The proposed top terminal location is similar to that identified in the 1997 Master Plan, while the bottom terminal is moved to better serve the novice skiers in the Buttercup/Red area. For visual considerations, towers and terminals would be medium gray in color in order to blend in with tree trunks (towers and lower terminal) and the mountain slopes (upper terminal).

Access to the top terminal would be via the obliterated Cascade Express construction road, then west approximately 1080 ft. on a new temporary road that would be minimally leveled and shaped to ensure safe transport of heavy equipment. Electrical power for the top drive terminal would be provided with a power line buried in this road alignment. Upon completion of top terminal construction, the temporary road would be restored to contour using an excavator to bring side cast material back into place. Water-bars would be built as needed, and the lower temporary road near Daisy would be planted with grass seed if deemed necessary by the district botanist and soil scientist.

The placement of the 2 terminals and 20 towers would impact approximately 0.7 acres of undisturbed ground and approximately 0.8 acres of previously disturbed ground. An estimated 8,200 cubic yards of material, most (5,000 cubic yards) coming from the bottom terminal location, would be excavated. That material would be used for fill or spread around and seeded. All areas with erosion potential would be heavily screened with silt fence or straw wattles during work and be properly restored with native vegetation, mulch, rock or erosion matting as approved by the District. Where possible, a hydro-seeder with the approved mix of biostimulants, soil tackifier, fertilizer, mulch and seed would be applied to disturbed areas.

A total of approximately 75 trees over 6 inch diameter would be removed from the lower terminal site, and along the lift alignment. An additional 9 small whitebark pine trees would be removed at the upper terminal site. Total amount of tree clearing in the sub alpine zone would be less than 0.2 ac.

Project Design Criteria

Prior to project implementation the District Botanist will review habitat areas with Mt. Hood Meadows personnel involved with project construction. Habitat perimeters will be marked to ensure that all project activity is restricted from entering buffer areas for *Calamagrostis brewerii* (Brewer's Reedgrass). Protection buffer distances will be documented. Monitoring will occur during and after project implementation. A monitoring report will be filed at the District and Headquarters offices.

Alternatives Analyzed, but Eliminated From Further Study

Over-Snow, No Road Alternative

A variation of the proposed action was analyzed because of public and agency concern for building temporary roads at high elevation. With that variation, the 1080 ft. temporary access road to the top terminal would not be built and used as proposed under alternative 2. In this scenario, the power line would still be trenched (3 ft wide X 3 ft deep) to the upper terminal site with an excavator, but no road improvement would be made to allow passage of construction equipment. Instead cranes, heavy excavators, lift drive assemblies, personnel and other equipment would be transported to the site over-snow. Some components, like concrete and support towers would be still flown to the terminal site with a helicopter.

The chairlift drive assemblies, at approx. 40,000 lbs, cannot be flown because a heavy lift helicopter has a capacity of 16,000 lbs at the altitude of the upper terminal site. The drive assemblies, however, could potentially be hauled on a sled pulled by two D-7 Low Ground Pressure (LGP) cats yoked in tandem (11/27/00 telephone discussions between Doug Jones and HALTON Equipment Co. – Caterpillar Dealer, Portland).

This alternative was dropped from further study when it became apparent that it was: **a)** logistically difficult and unsafe; **b)** an unreasonable added expense; **c)** would not significantly reduce the overall effects to natural resources as compared to the proposed action.

- a. To pull cranes, construction equipment and lift drive assemblies over snow requires a custom built sled for the project. An LGP cat would establish a snow road up from Daisy and across the open face to the terminal site. Great care must be taken to assure the sleds, cranes, etc do not slip off the road, rollover or otherwise be damaged. Continuous back and forth travel by employees hauling heavy equipment would be a safety risk over the snow in mountain weather conditions. An unknown amount of salt or ammonium nitrate fertilizer (multiple tons) may have to be applied to the snow route to keep the surface frozen and firm enough for the dozers to operate on.
- b. A custom sled would cost approx. \$25,000 and would have no future use to the ski area. The LGP dozer rental would cost \$10,000, but a contractor using them typically adds a large cost to the package because he is required to assume all risks for the project, the lift components and the rental equipment. In this unique case it's estimated that the added "risk cost" would be at least \$225,000. Most of the heavy

equipment (excavators, generators, cranes, etc) could not be taken off the mountain when the project was complete because the snow route would be melted by then. Hence, the equipment (at an estimated rental cost of \$10,000/month for 8 months) would have to remain on-site through the severe winter weather (not an idea the equipment rental company is excited about) until the following spring when enough snow was available to remove it. This equates to \$80,000 for sitting equipment plus the \$25,000 sled, \$10,000 dozers, and the \$250,000 risk assumption = \$365,000, plus the dozers returning in the spring @ \$10,000. This yields a total additional estimated cost of at least **\$375,000** assuming no costly damage occurs to equipment while transporting up and down the mountain. A formal bid process could result in higher costs. These high costs would be in addition to the “normal” costs associated with building a modern detachable quad (estimated at nearly \$2 million by POMA of America). This added cost could make the project unaffordable to the ski area, per conversations between the MHM General Manager and the Forest Service Permit Administrator.

- c. Regardless of how the construction equipment is moved to the upper terminal site, the same route would be used to bury the electric power cable using a large excavator that would disturb almost the same amount of ground as a roadbed. This power line trenching would require nearly the same level of restoration work as that needed to restore the temporary road as proposed in Alternative 2. The impacts to resources are about the same, so the agency elected to stay with the more conventional, truly feasible alternative with a temporary road.

1997 Master Plan Conceptual Alternative

In the 1997 Master Plan for Mt. Hood Meadows, Lift 21 was conceptually approved in a slightly different location than that currently proposed. The conceptual components of the Master Plan are in approximate locations that may change with site-specific analysis (ROD, page 5). During the Landscape Analysis and Design for Mt. Hood Meadows, the district ID Team discussed this conceptual location and found that it was problematic in regard to Timberline Trail impacts (the original lower terminal was located near the trail), and its effects on known *Calamagrostis brewerii* sites. After further study and ground reconnaissance, Mt. Hood Meadows proposed a new location that not only better addresses these resource concerns, but also better serves novice skiers operationally. This new alignment would also result in less than 0.2 acre of tree removal versus 2-3 acres in the original location. Because the new alternative alignment has fewer impacts on natural and social resources, the original location was not given further consideration.

Chapter 3 Environmental Effects and Consequences

Introduction

This chapter addresses the potential socio/environmental impacts associated with the construction of Lift 21. Direct, indirect and cumulative effects are included in this discussion. The latter are effects that occur because of a combination of past, current, and reasonably foreseeable future actions. Mitigation measures are also identified in this chapter by resource area. The No Action alternative is also analyzed and also provides a baseline reference.

Cumulative Effects – Cumulative effects are disclosed for each resource specialty area. The ID Team looked at the effects of development from 1967 to the present time including, in some cases, on-going projects like lower Cascade re-vegetation and re-vegetation of the new access road from Hwy 35 which is within the permit area. Because the Forest has no formal proposals from Mt. Hood Meadows for other projects, there is nothing in the foreseeable future to plug into cumulative effects analyses. The Ranger District is aware of the conceptual projects in the Master Plan, but there is no predicting when any of them could be brought forward as formal site-specific proposals. A storm water management system for the parking lots is planned as part of a settlement agreement, but no specifics have been provided to the Forest at the time of the writing of this report. Economics, weather trends, skier demand, and even politics all play-in to how ski areas formulate their development plan. A very flexible process is dictated.

Soils

Forest and MHM Master Plan Requirements

Relevant Standards and Guidelines from the MHNF's Land and Resource Management Plan

Reference effects section below (Analysis Methodology) for discussion on Standards and Guidelines.

Existing Conditions

Geologic processes on the Mt. Hood have created a mixed and highly varied combination of bedrock covered by many types of soil materials (1990 FEIS @ p III-10). Soil types at MHM reflect this variety, ranging from deep loamy glacial soils to poorly drained soils in meadow areas to shallow soils on steep slopes. These soils have developed mainly in glacial deposits with a wind deposited volcanic ash covering. A thin layer of decomposing organic matter, 1-2 inches thick, typically overlies the surface where conifers are present. Grass/forb dominated meadows tend to have well developed topsoils down to about six inches. Soils in the uppermost elevations are composed primarily of mixed sand and rock with very little vegetative cover. The depth of soil ranges from deep (greater than 50 inches) to very shallow (less than 20 inches). The major portion of the permit area has moderately deep to deep soils, especially in the lower elevations.

The area where Lift 21 is proposed is dominated primarily by two soil types. Both are described in the 1979 Mt. Hood National Forest Soil Resource Inventory (SRI). First is soil type 1 (fresh sands and gravels), occurring from the top of the Daisy Chair upper terminal up to the top of the proposed lift. As

examined in the field, this soil is extremely rocky and drains very quickly. No visible signs of water erosion were observed. Wind erosion appears to be the dominant erosion process in this area. The obliterated road (to access Cascade Lift) was barely visible.

Second is soil type 379, occurring below the top of the Daisy Lift down to the proposed bottom terminal. This is a sandy, well-drained soil with a mix of meadows and conifer stands. This soil is very stable as long as surface cover is present.

Information on soil type 379 obtained from the 1979 Soil Resource Inventory Report

Surface Soil Erosion Potential - Slight

Little loss of soil material is expected. Some minor sheet erosion may occur.

Subsoil Erosion Potential - Moderate

Considerable erosion such as rills and small gullies may occur. Factors indicate considerable erosion is likely to occur.

Natural Soil Mantle Stability - Stable

Only occasional failures are observed.

Sedimentation Yield Potential - Low

Sedimentation levels of silt and clay particles are not expected to be significant following management activities. Soils are generally moderately coarse-textured.

Expected Mass Movement as a Result of Man's Activities - Unchanged

The expected mass movement is relatively unchanged from that of the natural state.

Failure Potential on Road Waste and Fills - Low

Low, defined as failure on road waste and fills is sufficiently low to result in only minor damage to resources values.

Moderate, defined as failures on road waste and fills occur with sufficient frequency to cause moderate damage to resource values.

Effects

Analysis Methodology

Impacts to soil resources are disclosed with appropriate mitigation measures based on the Mt. Hood National Forest Land and Resource Management Plan as amended by the Northwest Forest Plan. Impacts such as soil disturbance caused by equipment operations as outlined in the proposed action will be measured relative to the existing conditions. Guidance for recovering

exposed sites is described in Mt. Hood Forest Plan standard FW-025, which states; In the first year following surface disturbing activities, the percent groundcover by soil erosion hazard class should* achieve at least the following levels:

Table 3-1

Soil Erosion Hazard Class	Effective Ground Cover
Low to Moderate	60%
Severe	75%
Very Severe	85%

* Should, as defined in the Mt. Hood Forest Plan, means that the action is required. However, case by case exceptions are allowed if identified and documented during interdisciplinary project planning.

Table 3-1 links effective groundcover, which may include vegetation, erosion control blankets, rocks, gravel, etc., to erosion hazard class. Therefore, the mitigation measures for achieving effective groundcover, actually also mitigate the erosion hazard.

Alternatives will also be measured by how well they meet or do not meet the Aquatic Conservation Strategy (ACS) Objectives as they pertain to the soil resource. This analysis is included under hydrology effects, section 3.3 of this EA.

Direct and Indirect, Short & Long Term Effects of the No Action Alternative - Alternative 1

In this alternative, soil erosion and developmental processes would continue to occur via natural processes. No changes are foreseen in the future.

Direct and Indirect, Short & Long Term Effects of Constructing Lift 21 - Alternative 2

In this alternative, Lift 21 would be constructed as outlined in the proposed action. Effective groundcover goals (FW-025) are expected to be met for all aspects of the construction. For clarity, this analysis will be broken down into the component of the construction, the effects of each, and mitigation measures for each component as follows:

- **Lower terminal construction**

The construction of the lower terminal would occur on a relatively flat site east of the bottom Red terminal. The footprint of the terminal itself is partially on previously undisturbed ground, while the access to the construction site is next to an existing road on previously disturbed and well-recovered ground. There would be a small fill slope on the Mitchell Creek side of the terminal. No adverse long-term indirect impacts are expected on Mitchell Creek. The only short term direct impact is the risk of erosion due to the bare ground associated with a widening of the existing road to access the construction

site, bare ground during the construction at the terminal location, and the small fill slope previously mentioned. The amount of eroded material would be small, and should not move far due to the groundcover surrounding the site. Soils in this area are high in organic matter and tend to re-vegetate well.

Mitigation Requirements:

Erosion cloth/wattles and seed used on the fill slope if its height exceeds three feet, otherwise seed and mulch should be sufficient.

Gravel, or seed and mulch the bare ground around the terminal site.

• **Tower installation**

The footings for these towers would be dug either with a walking backhoe or by hand (in riparian area), and the concrete poured by helicopter. Excavated soil material is then lay-ed back around the poured concrete up to the foundation edge, with the remaining soil spread around the tower, seeded and mulched. No adverse long-term indirect impacts are expected. The only short term direct impact is the very slight risk of erosion due to the bare ground around the tower footings. If any material did erode, the amount would be extremely small and likely only move a matter of a few feet.

Mitigation Requirements:

- Erosion cloth/wattles and seed used to cover bare ground around the footings if they occur within 20 feet of a live stream.
- Excess soil from the two riparian reserve towers will be removed and placed as restoration fill on the temporary road just above Daisy.
- A walking backhoe may be used at those two towers if/when the soil is dry.
- The excess soil should be hauled away using trail toters or similar low-ground-compaction tools to minimize the number of trips needed to haul off the material.

• **Temporary road construction, including power line installation and the road obliteration**

This road would allow equipment access and power line installation, and originate just above Daisy Lift, following the designated route illustrated on the Map located at the end of chapter 2. The majority of the road would be on an old obliterated road, with about one-third (upper portion) being new road. The road would be obliterated as soon as heavy equipment is no longer needed at the top terminal site. There should not be a need to over winter the road, since construction should be complete in one field season. No adverse long-term indirect impacts are expected. Short-term direct impacts include the likely potential of wind erosion on disturbed ground. However, the amount of fine material blown out should be small and not measurable, and once removed leaves behind a protective ‘pavement’ of gravel and rock material the protects the subsurface from continued wind erosion. Since the ground is so well drained and rocky, the chances of water erosion are extremely small. In addition, the rockiness of the ground virtually eliminates the chance of a power line trench blow out.

Mitigation Requirements:

Road out-sloped to eliminate the chance of water erosion. The previous road obliteration was effective with its lack of erosion, and the new obliteration should follow the same process.

The short section of road just above Daisy (before the ground becomes extremely rocky) will be de-compacted, brought back to grade, seeded and/or planted, and have erosion cloth replaced following road use.

• Upper terminal construction

The upper terminal construction would occur on very rocky terrain. A cut and fill consisting of approximately 2,335 cubic yards of material would need to be constructed to form a flat pad on which to place the terminal. The fill slope would be approximately 5 feet high. No adverse long-term indirect impacts are expected. As with the above road construction, short-term direct impacts include the likely potential of wind erosion on disturbed ground. However, the amount of fine material blown out should be small and not measurable, and once removed leaves behind a protective ‘pavement’ of gravel and rock material that protects the subsurface from continued wind erosion. Since the ground is so well drained and rocky, the chances of water erosion are extremely small.

Mitigation Requirements:

The fill slope should be covered with rock to reduce wind erosion and virtually eliminate the chance of any water erosion.

All equipment will be kept at least 20 feet away from the ephemeral drainage to the west of the terminal site and sediment fence and/or straw wattles will be used.

Cumulative Effects to Soils

Effects to the soil resource from this project are expected to be so small in scale and so short in duration that they could not be measured at the permit area level. However, the ski area does continue to have on-going revegetation difficulty, and thus erosion or potential erosion, in some areas. These include bottom terminal of Cascade including the top portion of the road leading there, the annex parking lot, bottom of Shooting Star and the new access road and interchange. Some were hydro-mulched in the summer and fall of 2000, and strong efforts will continue to be made to achieve effective groundcover on these areas as quickly as possible. In addition, the Shooting Star runs, which have had such revegetation difficulty in years past, continue to recover and exhibit much lower erosion rates now than in previous years.

Hydrology

Forest and MHM Master Plan Requirements

Relevant Standards and Guidelines from the MHN's Land and Resource Management Plan

Water quality associated with management activities shall be in compliance with Oregon State requirements (Oregon Administrative Rules, Chapter 340-41) established in accordance with the Federal Clean Water Act (1977, amended 1987). **FW-054**. Put Clean Water Act discussion here.

For discussion on Clean Water Act, please refer to Chapter 4.0, section 4.8.7 of this EA.

Individual, general Best Management Practices (BMP's) that may be implemented are described in General Water Quality Best Management Practices, Pacific Northwest Region, 11/88. Evaluations of ability to implement and estimate effectiveness shall be made at the project level. **FW-057/058**.

For discussion on BMP's, please refer to Chapter 4.0, section 4.8.7 of this EA.

Management practices causing detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment shall not be permitted (36 CFR 219.27e). **FW-060**.

Detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment are not anticipated as a result in implementation of this project. As described in the effects section below, there is a risk of a small amount of sediment being introduced into an ephemeral stream adjacent to the upper terminal, but the amount should not be detrimental as described in the fish habitat write-up.

In riparian areas, "The development of new, or expansion of existing, recreation sites, facilities, and trails may occur and should be located to protect riparian values". **B7-001, B7-002**.

For discussion on how the riparian values are protected, please refer to the analysis below.

In riparian areas, "Rock, soil or organic material should not be sidecast in the construction or maintenance of roads or landings...". **B7-056, B7-057**.

Mitigation specifying no sidecast of road material is included as a requirement for this project.

New recreational facilities within Riparian Reserves ... should be designed to not prevent meeting Aquatic Conservation Strategy (ACS) objectives. Construction of these facilities should not prevent future attainment of these objectives. **RM-1 (from ROD NW Forest Plan)**.

ACS objectives would be met by this project. Please refer to "Aquatic Conservation Strategy Objectives" section (pg XX) for a detailed discussion of this.

Existing Conditions

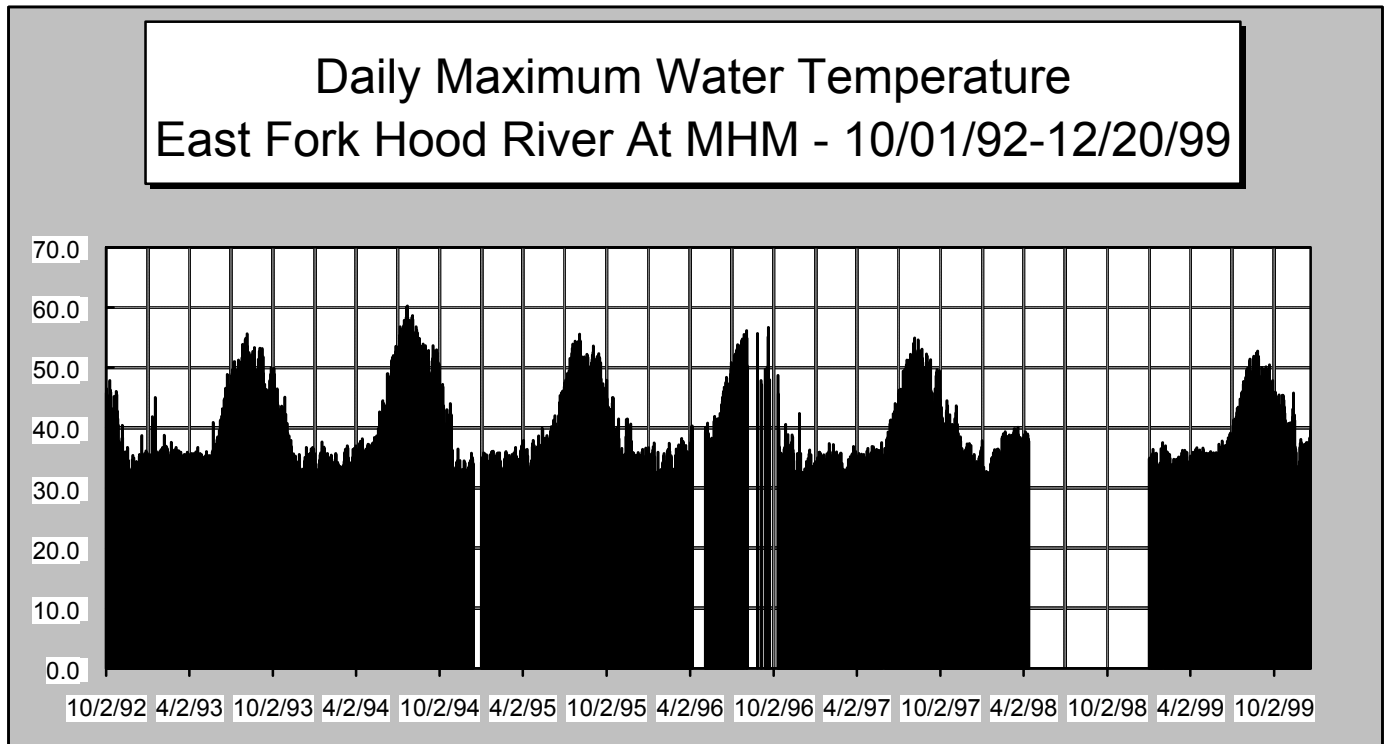
Hydrologic features in the MHM permit area consist of several small streams, permanent snowfields at higher elevations, and wet meadows in areas of lower elevation (1990 FEIS @ p III-16). The existing

permit area is drained by the East Fork Hood River and three main tributaries of the East Fork: Mitchell Creek, Meadows Creek, and Clark Creek.

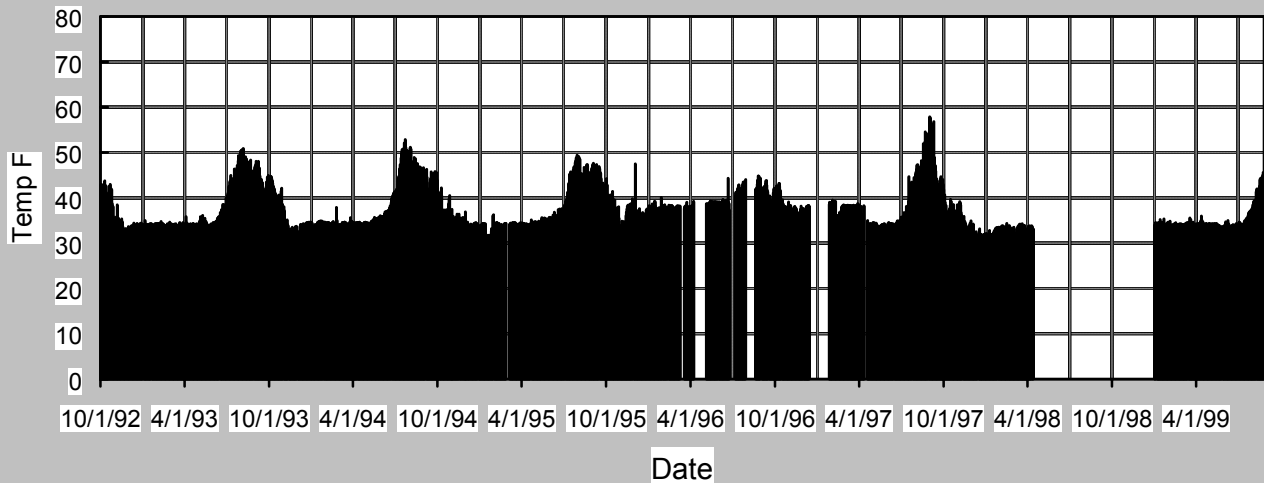
The drainage areas occupied by the streams within the permit area are all small (less than 3 square miles) and high in gradient (greater than 10% slope). The drainage pattern consists of a series of streams running in a southeast direction. The stream courses are generally well defined and typically shallowly incised. Streams in the area carry a heavy natural sediment load which originates mainly from upper elevation glacial action, wind and surface erosion, and mass failures. This heavy natural sediment load is a major influence on the character of these streams. In steep areas, the channels are typically cut to bedrock and the sides are steep and unstable. On flat reaches, the sediment load is deposited in deltas. The areas considered in this analysis are 7th field watersheds where this project will occur. Seventh field watersheds are small, generally several hundred to several thousand acres in size. These include Mitchell Creek and South Canyon Tributaries seventh field watersheds, which are 371 acres and 337 acres respectively.

Water Quality

Stream Temperature - Water temperature data has been collected on Mitchell Creek and the East Fork Hood River since 1992. Graphs showing daily maximum stream temperatures for each creek are displayed below.



Maximum Daily Water Temperature Mitchell Creek @MHM, 10/01/92-08/25/99



Maximum stream temperatures ranged as follows: 1) Mitchell Creek = 32 to 58 degrees Fahrenheit (°F); 2) East Fork Hood River = 35 °F to 60°F. All of these stream temperatures are below State of Oregon water quality standards (64°F).

Sediment – Turbidity measurements are taken hourly and suspended sediment daily at both monitoring stations mentioned above. Turbidity is the measure of the ability of light to pass through water, and is influenced by the amount of suspended sediment in the water sample (MacDonald et al., 1991). An analysis of this data was included in the East Fork Hood River Watershed Analysis. Results indicate that sediment “moves in these basins unevenly, in pulses”(W.A., H-6). No significant bank erosion or scour was noted for the period of record in the stream channels draining these stations, so the analysis concluded that primary sediment sources are “one or more of the following: naturally non-vegetated areas, human-disturbed areas, and aeolian (wind-deposited)”. The analysis stated that the division between natural and human-caused erosion and sedimentation is “unclear”. Eighteen months of suspended sediment data was compared between the control basin (Mitchell Creek) and the “managed” basin (E.Fk Hood) and each basin had approximately equal annual sediment load per unit land area. According to the analysis, the natural sediment load in both basins is “very high”.

Roads and culverts are likely responsible for a large part of the anthropogenic sediment production in this area (W.A., H-6). Road density (miles of road per square mile of basin) can be used as a general indicator of the amount of potential sediment production associated with roads. Road densities within a sub-basin that exceed 3.0 miles per square mile indicate areas that should be examined more closely for specific sediment related problems, although it is possible to have

isolated areas of road instability even in areas of low road density. This value is based on several years of observations by area Forest Service hydrologists, fish biologists, and earth scientists. Table 3-2 displaying road densities for sub-basins within the planning area.

Table 3-2

Sub-basin	Road Density (mi/mi²)
Mitchell Creek	2.9
South Canyon Creek	1.1

Neither of the sub-basins has a high road density, but some site specific erosion problems have been documented for roads in the South Canyon Tribs basin. A more detailed description of these site specific erosion problems is included in the soils section 3.2 of this document.

Flow/Hydrology

Peak Flow/Vegetation - Human activities such as timber removal and roads can influence the amount of water available for runoff and the timing of runoff, which may translate into increased peak flows (Harr, et al 1975, 1979, Harr 1979, Jones, et al 1996 and Wemple, et al 1996). These increased peak flows can cause stream channel damage in the form of increased bank erosion, channel scour, channel widening, and sedimentation.

A peak flow analysis was conducted for the project area as part of this planning process. The analysis models the degree of hydrologic recovery of a watershed. The Aggregate Recovery Percentage (ARP) is based on the size and density of tree crowns which affects snow accumulation and melting rates in a watershed. An ARP that falls below 70 percent indicates a possible need for more detailed analysis. Table 3-3 displays ARP percentages for sub-basins in the project area.

Table 3-3

Sub-Basin	Aggregate Recovery Percentage (ARP)
Mitchell Ck	83%
S. Canyon Tribs	93%

Although values are above the level of concern, a more detailed analysis was conducted on the planning area to further define existing conditions relating to peak flow anyway. The results of this analysis are displayed in Table 3-4.

Table 3-4

Sub-basin	% basin in transient snow zone	% basin S/SW aspect	% expanded stream miles	% Impervious Surfaces (Roads/Buildings)
Mitchell Ck	0%	0%	17% - 42%	4.5%
S. Canyon Tribs	0%	0%	9% - 21%	1.2%

Shaded values are high enough to be a concern to overall increased peak flows. The column headings in Table 3-4 represent existing human derived as well as natural physical conditions that influence peak flow (Harr, et al 1975, Harr, et al 1979, Harr 1979, Harr 1981, Christner, et al 1982, Jones, et al 1996, and Wemple et al 1996). These include: 1) current ARP as described in Table 3-3; 2) percent of the sub-basin in the transient snow zone (1200' to 3500') and subject to frequent, rapid snow accumulation and melting; 3) an estimate of the percent of the sub-basin that is in a south or southwestern aspect, which may expose the basin to quicker melting rates; 4) extension of the stream channel network from road construction is discussed in more detail below; and 5) percent of the sub-basin that is in a compacted state, which can decrease permeability that in turn may increase runoff.

Peak Flow/Drainage Network Increase - Another component of the peak flow analysis is the extension of the stream channel network by roads and ditch lines in roads. These factors may increase peak flows through the road cut-slope interception of subsurface flow and routing it to surface waters using ditch lines as pseudo-channels (Jones, et al 1996 and Wemple, et al 1996). The road surface also collects rainfall due to surface compaction, and routes this water to adjacent channels. See Table 3-4 for extension of stream channel network values. The Mitchell Creek sub-basin has extensions to the existing stream channel network that are reaching a value of concern.

Range of Natural Variability

The following description of the range of natural variability is extracted from the East Fork Hood River Watershed Analysis (referred to as reference conditions in this document).

Hydrologic System - The naturally occurring processes that influence the East Fork watershed riparian and aquatic habitats are complex and varied due to the proximity of the drainage to Mt. Hood. A combination of the local geology, climate and glaciation related to Mt. Hood have historically influenced the shape of the streams and associated riparian areas.

Landslides and debris flows have been common in much of the watershed and have had a significant affect on the East Fork drainage system. Steep drainages within unstable areas have high potential for landslide and debris flows during intense precipitation events, especially those occurring on a snowpack. Two recent examples of this phenomena are the Clark Creek and Newton Creek slides. These natural events brought large amounts of sediment into the East Fork system.

Effects to Hydrology

Direct and Indirect, Short & Long Term Effects of the No Action Alternative - Alternative 1

If alternative 1 is implemented, conditions described in the existing conditions section will be maintained. No new lift will be constructed.

Direct and Indirect, Short & Long Term Effects of Constructing Lift 21 - Alternative 2

Stream Temperature - There will be no direct or indirect effects on stream temperature from the proposed ski lift construction, due to very minor tree removal and no road construction activity in the Riparian Reserves. A more in-depth discussion of this is included in section 3.5 Aquatic/fisheries section of this EA.

Sediment – An estimated total of 1,080 ft. of temporary road will be constructed or reconstructed through the implementation of Alternative 2. None of this reconstruction/construction will enter Riparian Reserves. Sediment delivery potential is low for the temporary road construction due to road locations away from Riparian Reserves, erosion control measures and decommissioning of this road following lift installation. Burroughs and King (1989) found that 80% of sediment reaching streams from roads in the first year after construction, came from the fill-slope of the road. They also found that transport distances and obstructions between the fill-slopes and streams influenced the amount and likelihood of eroded material reaching these streams. Burroughs and King found that windrowed fill-slopes (fill-slopes that maintained down vegetation on the fill-slope surface and/or at the toe of the fill) had an average travel distance of 3.8 feet for eroded material, and a maximum travel distance of 33 feet. Similar results were found by Packer (1967). He found that “the most important factors that affect the distance that sediment moves are the spacing between downslope obstructions and an interaction between this spacing and the kind of obstruction”. He found that logs, rocks, and trees or stumps were the second, third, and fourth most effective materials in reducing sediment movement distances below roads. Travel distances were similar to those reported by Burroughs and King.

Sediment delivery potential is low to moderate for the excavation site at the upper terminal due to its close proximity to an ephemeral stream. As described in the soils discussion, the surrounding ground has a high rock content and is permeable, which should reduce the potential for delivery. The amount of erosion is expected to be low as described in the soils write-up (section XX), so actual sediment delivery to the channel should be very low.

Cumulative Effects to Hydrology

Stream Temperature - No detrimental cumulative effects are expected as a result of increased water temperature due to the small amount of vegetation proposed for removal in the Riparian Reserves. Reference aquatic/fisheries section (section xx) for a more detailed discussion on stream temperature.

Road density (miles of road per square mile of basin) can be used as a general indicator of the amount of potential sediment production associated with roads. As discussed in the “Existing Condition” section, roads and culverts are likely responsible for a large part of the anthropogenic sediment production in this area (W.A., H-6). Road densities within a sub-basin that exceed 3.0 miles per square mile indicate areas that should be examined more closely for specific sediment related problems, although it is possible to have isolated areas of road instability even in areas of low road density. This value is based on several years of observations by area Forest Service. Road density for each alternative is shown in Table 3-5.

Sub-basin	Road Density for Alternative 1 (mi/mi²)	Road Density for Alternative 2 (mi/mi²)
Mitchell Ck	2.9	2.9
S. Canyon Tribs	1.1	1.1

The only road proposed for this project is temporary and will be decommissioned after project completion, so permanent road density will not increase as a result of this project. If the temporary road is included in the road density calculation, the resulting road densities would be 2.9 and 2.3 for Mitchell Creek and S. Canyon Tribs respectively. This increase in density would be for less than 1 year (during project construction), and would then revert back to the values in the table above after road decommissioning.

No detrimental cumulative effects are expected as a result of sediment introduction due to establishment of Riparian Reserves, mitigation measures designed to minimize erosion and sedimentation, low existing road densities and the very small amount of sediment expected from project implementation.

Peak Flow/Vegetation –Lift 21 proposes to remove 0.2 acres of mature trees. ARP values for each alternative are displayed in Table 3-6.

Table 3-6

Sub-basin	Alternative 1	Alternative 2
Mitchell Ck	83%	83%
S. Canyon Tribs	93%	93%

The ARP values projected out 10 years are displayed in Table 3-7 for each alternative assuming no additional tree removal occurs during this time period.

Table 3-7

Sub-basin	Alternative 1	Alternative 2
Mitchell Ck	83%	83%
S. Canyon Tribs	93%	93%

In general, there would be no measurable risk of increased peak flow resulting from implementation of Lift 21. Alternative 2 proposes 0.2 acres of tree removal in S. Canyon Tribs sub-basin, but this is not enough to change outputs of the model. The risk of increased peak flow is further minimized by the location of the project area in the snow dominated elevation zone.

Peak Flow/Drainage Network Increase - Proposed temporary roads do not cross any new streams, so the action alternative would increase the drainage network.

Aquatic Conservation Strategy Objectives

In order for a project to proceed, “a decision maker must find that the proposed management activity is consistent with the Aquatic Conservation Strategy objectives” (ROD B-10). The nine objectives are listed on page B-11 of the ROD. The effects analysis above has focused on key parameters or indicators that make up elements of the nine Aquatic Conservation Strategy objectives, to determine if the Lift 21 project will restore, maintain, or degrade these indicators. Once this determination has been made, the indicators should be examined together to make a final determination of whether the project is consistent with the objectives. Table 3-8 displays the individual indicators and the effect this project has on those indicators at the 5th and 6th field watershed scale. Fifth field watersheds are generally large in size (40,000 acres to 250,000 acres), while 6th field watersheds are smaller (5,000 acres to 40,000 acres).

Table 3-8

INDICATORS	Effects of the Actions Alternative 1			Effects of the Actions Alternative 2		
	Restore ¹	Maintain ²	Degrade ³	Restore	Maintain	Degrade
<u>Water Quality:</u> Temperature		X			X	
Sediment		X			X	
Chem. Contam.		X			X	
<u>Habitat Access:</u> Physical Barriers		X			X	
<u>Habitat Elements:</u> Substrate		X			X	
Large Woody Debris		X			X	
Pool Frequency		X			X	
Pool Quality		X			X	
Off-channel Habitat		X			X	
Refugia		X			X	
<u>Channel Cond. & Dynam:</u> Width/Depth ratio		X			X	
Streambank Cond.		X			X	
Floodplain Connectivity		X			X	
<u>Flow/Hydrology:</u> Peak/base flows		X			X	
Drainage Network		X			X	

INDICATORS	Effects of the Actions Alternative 1			Effects of the Actions Alternative 2		
	Restore ¹	Maintain ²	Degrade ³	Restore	Maintain	Degrade
Increase						
<u>Watershed Conditions:</u> Riparian Reserves		X			X	

¹“Restore” means the action(s) will result in acceleration of the recovery rate of that indicator.

²“Maintain” means that the function of an indicator does not change by implementing the action(s) or recovery will continue at its current rate.

³“Degrade” means to change the function of an indicator for the worse.

The following summarizes Table 3-8:

- The proposed project has a risk of adding some minor amounts of sediment to an ephemeral channel, but since the amount is so small and not expected to effect watershed function, the project will maintain this element.
- Indicators other than those described in the proceeding paragraph will be maintained as outlined in the effects analysis above.

Table 3-9 displays specific Aquatic Conservation Strategy objectives and the indicators from the previous table that comprise each objective. All of the indicators that are checked for a particular objective should be evaluated together to determine whether the action maintains or enhances the specific Aquatic Conservation Strategy objective.

Table 3-9

Aquatic Conservation Strategy Objectives									
Indicators	#1	#2	#3	#4	#5	#6	#7	#8	#9
Temperature		X		X				X	X
Sediment				X	X	X		X	X
Chem. Contam.				X				X	X
Physical Barriers	X	X						X	X
Substrate			X		X	X			X
Large Woody Debris			X					X	X
Pool Frequency			X						X
Pool Quality			X						X
Off-Channel Habitat	X	X	X						X
Refugia	X	X						X	X
Width/Depth Ratio			X					X	X
Streambank Condition			X			X		X	X
Floodplain Connectivity	X	X	X				X	X	X
Peak/base Flows					X	X	X		
Drainage Network Increase					X	X	X		
Riparian Reserves	X	X	X	X	X	X		X	X

The following is a summary of how this project compares to the Aquatic Conservation Strategy objectives (ROD B-10):

- **ACS Objective #1.** This project will maintain the distribution, diversity and complexity of watershed and landscape-scale features because of the protection that

the Riparian Reserves provides to the aquatic and terrestrial systems. No new road crossings of streams or wetlands are proposed, which would maintain the current level of aquatic habitat fragmentation. Channel components that contribute to channel complexity (pool quantity and quality, substrate, flows) will be maintained through establishment of the Riparian Reserves.

- **ACS Objective #2.** The project will maintain spatial and temporal connectivity within and between watersheds. Decommissioning the temporary road will maintain the connectivity within and between watersheds by encouraging tree growth on roadbeds and re-establishing filtration of water through soil instead of down road surfaces. Functions of wetlands and meadows are being maintained through establishment of Riparian Reserves.
- **ACS Objective #3.** This project will maintain the physical integrity of the aquatic system, including streambanks, sidechannels (refugia), and channel bottom configurations through the establishment of Riparian Reserves. Mitigation measures aimed at reducing soil compaction and erosion, and the lack of any new stream crossings will greatly reduce risks of increased peak flow, and resulting bank erosion and channel bed scour. There are no temporary roads entering the Riparian Reserves and slight inputs of sediment from the upper terminal are expected to be very localized if they occur. As described in the “Range of Natural Variability” section, this project is located in an area that has a very high natural sediment level due to erosional processes that occur on Mt. Hood.
- **ACS Objective #4.** This project will maintain water quality necessary to support healthy ecosystems through mitigation measures and ~~implementation~~ establishment of Riparian Reserves, which will maintain stream temperature. Mitigation measures aimed at reducing erosion (erosion control and road decommissioning) will maintain the overall sediment levels in the long term, but there is a low risk of short term, limited increase at the upper terminal site. Since the amount is so small and not expected to effect watershed function, the project will maintain this element.
- **ACS Objective #5.** This project will maintain sediment regimes through mitigation measures, road decommissioning and ~~implementation~~ establishment of Riparian Reserves. The temporary road will not be entering the Riparian Reserves. There is a low risk of slight inputs of sediment from the upper terminal, but they are anticipated to be very small and localized. As described in the “Range of Natural Variability” section, this project is located in an area that has a very high natural sediment level due to erosional processes that occur on Mt. Hood.
- **ACS Objective #6.** This project will maintain in-stream flows through mitigation measures, Riparian Reserves and temporary road decommissioning. As described in the effects section, no increase in peak flows will result from this project.
- **ACS Objective #7.** This project will maintain the timing, variability, and duration of floodplain inundation through mitigation measures, Riparian Reserves and temporary road decommissioning. As described in the effects section, no increase in peak flows

will result from this project.

- **ACS Objective #8.** Lift 21 project will maintain the species composition and structural diversity of plant communities in riparian areas and wetlands through establishment of Riparian Reserves and through road decommissioning.
- **ACS Objective #9.** This project will maintain and restore habitat to support well-distributed populations of native plant and riparian dependent species through mitigation measures and through establishment of Riparian Reserves.

Vegetation

Forest and MHM Master Plan Requirements

Relevant Standards and Guidelines from the MHN's Land and Resource Management Plan

Developed facility master plans or special use permits may allow tree removal to achieve recreation objectives. **A11-025.**

Existing Conditions

Current condition is described at the finest scale, limited to the route of the proposed lift and the access road. Two scales are addressed in assessing potential impacts to the extent and pattern of vegetation communities: the Mt. Hood Meadows permit area, and the alpine/subalpine zone around Mt. Hood.

Lift 21's route spans the vegetation types typical of the transition from subalpine to alpine environments. The lower half of the proposed lift route crosses an artificially created and maintained clearing through the subalpine forest/meadow mosaic. The clearing is bordered by individual trees and clumps of trees, with patches of tall shrub or low shrub openings. This mimics the pattern of the forest/meadow mosaic. Ongoing vegetation management includes removal of tree regeneration and control of shrub height. Revegetation treatments included seeding with non-natives. No data are available on the opening's current species composition or abundance compared to natural openings in the type.

Above the artificial opening the lift route passes through the transition into krummholz with patches of low shrub (heather) communities, grass/forb meadow, and some pincushion communities. Tall shrubs are uncommon and vegetation is under snow most of the year.

The top quarter of the proposed lift line crosses a snowfield and sparsely vegetated pincushion communities amid bare ground, gravel, and rock at the highest elevations.

Roughly $\frac{1}{4}$ of the new road extension to access the top terminal crosses the krummholz,

while the remainder crosses pincushion types or transient snowfield. Less than a thousand feet of the pre-existing road length crosses krummholz and a low shrub patch; the majority is within the subalpine forest/meadow mosaic.

Ecology data from vegetation plots installed 1987-1989 include plots very close to the lift route. These plots are used to characterize the vegetation of the site; Table 3-10 summarizes stand characteristics by community.

The lower end point of Lift 21 is near the upper boundary of the closed forest with meadow inclusions and the lower boundary of the subalpine forest/meadow mosaic. The forest there contains dense patches of cove forest with old growth mountain hemlock. Forests become more open and shorter as elevation increases. As the lift rises to the upper boundary of the subalpine forest/meadow mosaic, stands transition to krummholz tree island communities with white bark pine and mountain hemlock.

Table 3-10

Plant association (Diaz et al, 1997)	elevation	tree height	age *(breast height)	tree cover	species
Mt. hemlock/luzula subalpine forest/parkland transition	5510'	105-110'	193-266	70%	mt.hemlock
Mt. hemlock/luzula subalpine forest/parkland transition	5680'	60-70'	113-164	30%	mt.hemlock subalpine fir
Mt.hemlock-white bark pine/luzula subalpine parkland	5960'	30-45'	104-139	20%	mt.hemlock white bark pine
Mt.hemlock/juniper krummholz tree island	6440'	25-35'	55-87	10%	mt.hemlock white bark pine

*Note that age at breast height does not include growth period to reach 4.5' height. As environments become more severe, growth becomes more retarded.

Effects on Vegetation

Direct and Indirect, Short & Long Term Effects of the No Action Alternative - Alternative 1

There would be no direct, indirect, short or long-term effects to the vegetation ecology as a result of the no-action alternative.

No additional cumulative effects to the vegetation ecology would result from the no-action alternative.

Direct and Indirect, Short & Long Term Effects of Constructing Lift 21 - Alternative 2

Discussion on extent, condition, and pattern of vegetation communities:

Snow farming/trampling: Snow farming alters the amount and retention of snow available to a microsite. Soil moisture gradients within an overall temperature regime are often diagnostic of plant community distributions. (Franklin and Dyrness 1987). If there is a decrease in soil moisture, mesic herb communities might move toward cushion plant

community conditions. Possibly, then, if more water were added and retained in the soil, some of the more mesic communities could replace the pincushion species, or some of the understory under the krummholz could shift to favor species that favor moister conditions or later snow melt. Adding water to sites without much duff/organic matter that could hold it may result in fairly slow community shifts, due to the length of time needed to build soil moisture holding capacity. Direct human impacts to alpine vegetation are often related to changing physical soil structure, or injury to individual plants' shoots or root systems. Compaction and related puddling favor species adapted to late snow melt and cold surface water. Other human effects include soil disturbance and trampling, which can favor grasslike species which can spread by tough, hardy runners in disturbed soil, but can be hard on shrubs. (VanderSchaaf 1982). Trampling affects species richness and plant community structure in all alpine/subalpine vegetation types: subalpine meadow, alpine, and forest communities, with forest understory being most sensitive in plant cover (Monz et al. 1994). Possible changes due to snow farming should produce slower vegetative response than sudden physical changes to soil moisture regimes. It should be noted that the species and communities present are adapted to climatic swings which can increase or decrease snow loadings for years, decades, or longer. Studies on alpine/forest ecotones have shown that dry years favor tree regeneration on moist sites, while wet years favor tree regeneration on dry sites (Miller, 1995). Where snow is added to dry pincushion or krummholz sites, tree establishment may be enhanced (Klasner, 1999). Within krummholz patches, tree growth rates and tree cover may increase. Where more snow is laid on to already wet sites, tree establishment may be discouraged. Moist sedge-dominated communities may increase.

Two scales are addressed in assessing potential impacts to the extent and pattern of vegetation communities: the Mt. Hood Meadows permit area, and the alpine/subalpine zone around Mt. Hood.

Cumulative effects to plant communities from activities in the MHM permit area are due principally to:

- Conversion of vegetated areas to roads, parking lots, buildings
- Forest clearing (tree removal)
- Manipulation of succession and shrub growth within vegetated clearings
- Revegetation methods/use of non-natives.

These impacts have affected composition, extent, and landscape pattern of the communities within the permit area. Patch size, distribution, and connectivity of plant communities affect wildlife and plant habitat and dispersal.

Increased fragmentation from permanent openings (roads, parking lots, buildings) and new or enlarged non-forest openings affects species adapted to edges (contrasting communities) as well as interior species (those species requiring moderated microclimates within patches). This is particularly true for tall forest, represented in the MHM area by subalpine forest/meadow mosaic, high elevation open canopy forests, and closed canopy forests of the lower elevations.

In MHM, besides the public access road and major lodge/parking lot complex, the major fragmentation comes from the construction of runs through the subalpine forest/meadow mosaic and the open canopy and closed forests of the lower elevations. Impacts from fragmentation in the mosaic type are mitigated because the ski area design took advantage of the meadows, natural linear openings, which reduced the need for clearing additional acres. However, the non-forest openings have been considerably widened and are more connected; the forest patches in the mosaic are smaller, shorter, and narrower than their natural pattern. Microclimate conditions and interior-to-edge ratios have been changed. Habitat for interior species has been reduced; habitat for edge species has been expanded. However, “interior” stand conditions will be less moderated in a mosaic made of patches rather than a matrix of forest. Lift 21 construction entails enlarging the already existing large clearing by 1/4 acre by removing trees in two places. The removal of the trees for the bottom terminal does not create a new opening and does not impact any unaltered piece of the mosaic complex. Edge effects will extend somewhat farther into the stand. The other proposed tree removal near the Daisy chairlift is from an extremely small patch of trees, above artificial clearings on two sides, and just below the krummholz and pincushion communities. The affected patch is too small to provide interior habitat. The amount of additional clearing does not affect the landscape pattern, function, composition, or extent of the remnant subalpine forest/meadow mosaic in the ski area.

Fragmentation of the non-forest communities in the alpine pincushion vegetation type occurs naturally at a fine scale. They exist in a finely fragmented topography where minor ridges, changes in aspect, and patches of rock, snow, or gravel, control and confine the communities. The typical plants are very short, and they have little effect on wind speed or air moisture, etc. Microclimate edge effect and interior conditions aren't particularly applicable to this type. Where fragmentation can alter composition, establishment, and growth of species in a forested context, fragmentation at the small scale of Lift 21's access road or facilities sites will not affect the communities present much past the extent of ground disturbance. Most impacts to the sparse, patchy communities along the upper half of the lift will occur around lift and road construction, reconstruction, and decommissioning. Such effects are likely to remain tightly localized unless, contrary to projections, summer use increases dramatically. While impacts from soil disturbance (tower sites, road construction/road use) are likely to remain localized, they will probably persist in those delicate, slow to re-vegetate communities. Most vegetation in the project area is protected by snow during ski season, so unless directly disturbed during construction, the pincushion communities should not receive significant impact.

Vegetation management within the large existing patch has altered successional processes by controlling tree establishment and recovery of forest edges, by limiting shrub height, and by introducing competing herb species. In some areas, plant cover has not recovered from original ground disturbance/stump removal. While some typical non-forest structure, pattern, and composition is retained in the permit area, it is possible that composition and condition of the altered non-forest patches may affect the habitat required by some birds, small mammals, and insects, and indirectly affect the predator populations as well.

Lift 21 will piggy-back on the existing clearing with its on-going vegetation management. It

will not open up a new area of meadow in the forest/meadow mosaic to vegetation management.

Landscape criteria for vegetation community effects include extent as well as composition and pattern. If the acreage of a community, or the location, is limiting, then even small amounts of affected area are proportionately more significant to the populations or functions associated with that community.

The following table shows the cumulative effects of Mt. Hood Meadows across broad alpine/subalpine vegetation types as mapped in GIS for the entire mountain. Acreage changes from implementing Alternative 2 for Lift 21 are not large enough to change the acre summaries from existing impacts.

Table 3-11 CUMULATIVE EFFECTS

Alpine type	Type acres	MHM acres	MHM pct	MHM Cleared acres	% impacted in MHM	TLSA acres	TLSA Cleared acres	% impacted in TLSA	% Mt. Hood alpine type impacted in ski areas
Non-alpine type in permit area	2063	1438	70%	152	11%	625	89	14%	12%
High Elevation open canopy forest	1115	54	5%	0	0%	205	42	20%	4%
Krummholz stringers	1121	220	20%	8	1%	25	trace	2%	1%
Low shrubs	751	85	11%	0	0%				0%
Meadows	682	55	8%	7	1%				1%
Snow, rock, ice & no vegetation	4410	175	4%	0	0%	177	0	0%	0%
Sparse vegetation/pin cushion communities	6564	623	9%	8	0%	362	10	3%	Trace%
Subalpine forest/meadow mosaic	3731	771	21%	216	6%				6%
Tall shrubs	521	43	8%	14	3%	13	1	9%	3%

The table identifies the acres of each type in the Mt. Hood Meadows permit area, the total acres around Mt. Hood, the percentage of the type in the permit of area, how many acres in each type have been cleared, and the percentage of the overall type in the Mt. Hood Meadows' clearings. The last three columns show similar information for the Timberline Ski Area (TLSA) permit area, and the overall impact to the type summed across both permit areas. It should be noted that road impacts to the very open communities like the krummholz and sparse vegetation/pincushion may be somewhat underestimated, since those will not

always appear as clearings. However, road impacts across these communities in MHM might affect an additional 3 acres.

The subalpine forest/meadow mosaic type has had the most impact from Mt. Hood Meadows ski area, while the krummholz and sparse vegetation/pincushion type have had relatively little. Clearing within the permit area has affected 6% of all mapped subalpine forest/meadow mosaic.

MHM holds a disproportionate share (~20%) of both subalpine forest/meadow mosaic and krummholz stringers. The landscape pattern of extensive subalpine forest/meadow mosaic capped by substantial krummholz characterizes the southeast quadrant of Mt. Hood, in contrast to the patterns elsewhere on the mountain. (Compare the communities present in the Timberline Ski Area permit area, where the subalpine forest/meadow mosaic is absent, while the sparse vegetation/pincushion communities are proportionately more significant.) Under some scenarios for climate change, maintaining the condition of the ecotones between high elevation forest, subalpine forests and meadows, and alpine communities may be even more important as timberline itself is expected to change.

If the construction of Lift 21 were to further fragment the subalpine forest/meadow mosaic, the cumulative impact could be more significant. However, it would not add to impacts of that type. Where it would cross the alpine fringe, it would not fragment it, due to the pre-existing natural breaks across the snowfields to the northwest. The proposed tree removals extend a naturally ragged fringe and a pre-existing and persistent artificial patch.

Mitigation Measures

MHM has initiated transplanting natural regeneration from clearings into areas identified as suitable for reforestation (areas once cleared for ski activities, but no longer requiring vegetation control). Returning forest cover to previously cleared areas will reduce the impacts to the pattern and extent of the subalpine parkland and subalpine forest/meadow mosaic.

Edges that have been replanted may be considered recovered when:

- the density of the transplanted trees approximates the density of the adjacent stand, and
- the canopies of the transplants reach the bottom of the crowns of the adjacent trees.

Botanical Threatened, Endangered, and Sensitive Species and Other Species of Interest

Forest and MHM Master Plan Requirements

Relevant Standards and Guidelines from the MHNF's Land and Resource Management Plan

Threatened, endangered and sensitive plants and animals shall be identified and managed in accordance with the Endangered Species Act (1973), the Oregon Endangered Species Act (1987), and FSM 2670. **FW-174.**

Habitat for threatened, endangered and sensitive plants and animals shall be protected and/or improved. **FW-175.** *This will occur with buffers for Calamagrostis brewerii.*

Biological Evaluations (FSM 2672.4) shall be prepared for all Forest Service planned, funded, executed, or permitted programs and activities for possible effects on endangered, threatened or sensitive species. **FW-176.**

Northwest Forest Plan – Survey and Manage Species

There is no suitable habitat in the proposed project area for S/M vascular plant species. Suitable habitat for 2 moss species, 1 liverwort species, and 1 lichen species is present below tree line. No s/m species were found during surveys conducted on 6/28 and 7/24/2000. Suitable habitat for 5 fungi species is present in the forest at the proposed bottom terminal site; the area was surveyed on 10/7, 10/21, and 11/5/2000. No s/m species were found. All surveys were conducted to protocol.

Existing Conditions

Region 6 Sensitive Plant Species

There are 35 Sensitive Plant species that are documented or suspected to occur on the Hood River Ranger District. Of the 35 species only 1 species (*Calamagrostis breweri*) is known to occur in the Mt. Hood Meadows (MHM) Permit Area. There is suitable habitat directly adjacent to the project area for 5 species; suitable habitat includes meadows, riparian areas, and a few stable rocky crevices above the Daisy Lift. Surveys were conducted on 6/28 and 7/24/2000. *Calamagrostis breweri* was found in the project area along the riparian corridor above the road to Daisy Lift. No other sensitive species were found. (2000 Botanical Assessment report #MHM.FY01/01).

Endangered or Threatened Species

There are no federally listed threatened or endangered plant species or suitable habitat in MHM (1990 FEIS @ p. III-26).

Direct and Indirect, Short & Long Term Effects of the No Action Alternative - Alternative 1

There would be no direct, indirect, short or long-term effects to Sensitive, Threatened, Endangered, or Survey and Manage botanical species.

Direct and Indirect, Short & Long Term Effects of Constructing Lift 21 - Alternative 2

State Certified Noxious Weeds

There is a potential Moderate Risk of introducing and/or spreading noxious weeds by machinery and equipment associated with project implementation. Decision documents are required to identify noxious weed control measures for all projects that have a moderate to high risk of introducing or spreading noxious weeds (FSM 2081.03, 11/29/95). Identifying measures that prevent the spread of noxious weeds meets the intent of the Vegetation Management EIS, the Forest Plan regarding biodiversity of desired native species, and the recent Executive Order regarding the spread and control of invasive non-native species.

Prevention measures required to reduce risk of spreading noxious weeds include cleaning of equipment. Before entering the Mt. Hood National Forest all machinery must be free of soil clumps and vegetative matter or other debris that could contain or hold seeds. Cleaning of equipment may include pressure washing and shall be done outside of the National Forest Boundary. MHM will be responsible for inspecting all machinery and project equipment before they are allowed to operate at the project site. A copy of the inspection report will be given to the District Botanist for the District botany records.

Currently knapweed is found around the base of the South Lodge and behind the maintenance building. District personnel check the areas each year and either pull new plants or get MHM to do it. This type of monitoring occurs at construction sites for several years to assure no weed seed has germinated.

Region 6 Sensitive Plant Species

Calamagrostis breweri habitat would be avoided by project activity. Suitable habitats adjacent to the project area would be clearly marked.

There are no foreseeable direct or indirect short or long-term effects to *Calamagrostis breweri* individuals or habitat as a result of project implementation. The proposed project would have No Impact to R6 Sensitive Plant Species or Their Habitat.

Threatened and Endangered Species

There are no known sites or suitable habitat. The proposed project would have no direct, indirect short or long term effects to Federally listed or candidate Threatened or Endangered botanical species.

Cumulative Effects to Botany

There are no foreseeable cumulative effects to Sensitive, Threatened, Endangered, or Survey and Manage botanical species as a result of project activity. Some loss of *Calamagrostis breweri* has probably occurred since 1967 in the Mitchell Creek drainage, but it would have occurred before the plant was identified on a sensitive species list and before the District employed a botanist. Since that time, the plants have been and will be protected.

WILDLIFE

Forest and MHM Master Plan Requirements

Relevant Standards and Guidelines from the MHNF's Land and Resource Management Plan

Standards and guides are the same as for botanical.

Existing Conditions

Four federally listed threatened or endangered species are present on the MHNF. The bald eagle (threatened) may occur as an occasional visitor to MHM, as may the recently listed Lynx (endangered). The California wolverine (endangered) may also occasionally occur within the permit area. The Northern spotted owl occurs in the vicinity of the permit area, but has not been observed within the permit area itself.

Four species classified as Management Indicator Species (MIS) in the Forest plan have been observed or are considered likely to occur in the area. They are: pileated woodpecker, elk, mule deer, and pine marten (1990 FEIS @ p III-37). Other species of importance to the State of Oregon, or included on the MHNF sensitive species list known to occur or are considered likely to occur in the area are: Lewis' woodpecker, Hairy woodpecker, Three-toed woodpecker, Black-backed woodpecker, American kestrel, Northern flicker, Violet-green swallow, Mountain chickadee, Red-breasted nuthatch, Mountain bluebird, Fisher, Harlequin duck, Northern goshawk, Cascades frog, Tailed frog, Pacific giant salamander, Cooper's Hawk, Vaux's swift, and Sharp-shinned hawk.

The area is habitat for deer and elk, which will use the open vegetated ski runs as summer forage and the timbered stringers as thermal and hiding cover. The timbered patches are habitat for a variety of birds both cavity nesters and tree nesters.

Wolverine tracks have been observed near the ski area (Snow Bunny Lodge). They are likely transient to the ski area. Wolverines try to avoid human interaction. Pine martens, a Mount Hood NF Management Indicator Species (MIS), are reported to occur in the ski area, particularly in the vicinity of open meadows. Given the quantity and quality of mature forests and meadows habitat, this species is expected to be common in the ski area. The pileated woodpeckers (MIS) appear to be widely distributed throughout the MHM ski area. An abundance of snags and mature timber in the area indicates that habitat is optimal.

Mountain lions are known to occur in the ski area and most likely associated with deer and elk areas. Spotted Owls have been observed near the ski area in the White River drainage, Clark and Newton Creeks. Their habitat appears to be below the 5000-foot elevation line. Bald eagles may occasionally occur as a migrant or vagrant. Peregrine falcons are likely to occur as an occasional visitor in the summer in suitable foraging habitat, but are very unlikely to nest in or near the ski area.

Effects to Wildlife

Direct and Indirect, Short & Long Term Effects of the No Action Alternative - Alternative 1

There will be “No Effect” to any of the threatened or endangered species listed in the table below. No habitat will be removed with this alternative. There will be “no impact” to any of the R6 sensitive species listed below except the wolverine which will have a “may impact individuals but not cause a trend to federal listing or loss of viability”. The continued presence of humans at the ski area will continue to negatively impact wolverines and their use of the area. Wolverines are secretive shy individuals and try to avoid human contact.

There will be no impact to any of the protection buffer and C3 species listed in the table below as no habitat will be removed. There will also be no impact to deer and elk, as no cover habitat will be removed. There will be no impact to pine martens (MIS) and pileated woodpeckers (MIS) as no habitat will be removed.

Species	Habitat	Presence	Surveys	Effects
Threatened, Endangered or Proposed				
bald eagle (<i>Haliaeetus leucocephalus</i>)	N ¹	-	-	NE
northern spotted owl (<i>Strix occidentalis caurina</i>)	N	N	N ²	NE
Canada lynx (<i>Lynx canadensis</i>)	N	Unk	N	NE
R6 Sensitive Species				
wolverine (<i>Gulo gulo luteus</i>)	Y ¹	Y ¹	N	MIIH
peregrine falcon (<i>Falco peregrinus anatum</i>)	N	-	-	NI
Larch Mountain salamander (<i>Plethodon larselii</i>)	Y	N	Y	NI
greater sandhill crane (<i>Gus canadensis tabida</i>)	N	-	-	NI
harlequin duck (<i>Histrionicus histrionicus</i>)	N	-	-	NI
black rosy finch (<i>Leucosticte atrata</i>)	Y	Unk	Y	NI
ferruginous hawk (<i>Buteo regalis</i>)	N	-	-	NI
Cope's giant salamander (<i>Dicomptodon copei</i>)	N	-	-	NI
red-legged frog (<i>Rana aurora</i>)	N	-	-	NI
Protection Buffer Species				
white-headed woodpecker (<i>Picoides albolarvatus</i>)	N	-	-	NI
black-backed woodpecker (<i>Picoides arcticus</i>)	Y	Unk	Y	NI
pygmy nuthatch (<i>Sitta pygmaea</i>)	N	-	-	NI
flamulated owl (<i>Otus flammeolus</i>)	N	-	-	NI
great gray owl (<i>Strix nebulosa</i>)	N	-	-	NI
Survey and Manage (C3) Species				
Dalles Sideband (<i>Monadenia fidelis minor</i>)	Y	N	Y	NI
Puget oregonium (<i>Cryptomastix devia</i>)	Y	N	Y	NI
Columbia oregonium (<i>Cryptomastix hendersoni</i>)	Y	N	Y	NI
Evening fieldslug (<i>Deroceras hesperium</i>)	Y	N	Y	NI
Malone jumping-slug (<i>Hemphillia malonei</i>)	Y	N	Y	NI
blue-grey tail-dropper (<i>Prophysaon coeruleum</i>)	Y	N	Y	NI

The proposed action would have no impact on those protection buffer species (listed in the table below) with no habitat present. The remaining snags in the timbered stands adjacent to the Lift 21 project will be adequate to meet the standards and guidelines set in the Record Of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl for the black-backed woodpecker.

The effects of this project on deer and elk would be minimal. The existing cleared ski runs, natural subalpine and alpine meadows, and other natural openings are barely used for foraging. The most heavily used forage areas are the Stringer Meadows and other similar wetland meadows near the base of Shooting Star lift. A few wetland areas existing on cleared ski runs are also heavily used for foraging. Areas of huckleberry and other shrubs such as willows are occasionally heavily used in old – growth forest areas. The removal of approximately .2 of an acre of hiding and thermal cover would not make any discernable change to the habitat effectiveness of the MHM permit area. Good cover still exists in the White River drainage and on the east half of the permit area.

The impacts of this project on pine martens (MIS) would be minimal as only approximately .2 of an acre of timbered habitat is being removed. This would cause a slight reduction in timbered forage habitat but an increase in meadow forage habitat. The down wood component currently existing within the timbered stands is not suitable for denning habitat.

This lift 21 project would have minimal impact on the pileated woodpeckers (MIS). The diameters of the trees being removed are generally smaller (less than 20” DBH) than the pileated woodpeckers prefer.

Species	Habitat	Presence	Surveys	Effects
Threatened, Endangered or Proposed				
bald eagle (<i>Haliaetus leucocephalus</i>)	N ¹	-	-	NE
northern spotted owl (<i>Strix occidentalis caurina</i>)	N	N	N ²	NE
Canada lynx (<i>Lynx canadensis</i>)	N	Unk	N	MENL
R6 Sensitive Species				
wolverine (<i>Gulo gulo luteus</i>)	Y ¹	Y ¹	N	MIIH
peregrine falcon (<i>Falco peregrinus anatum</i>)	N	-	-	NI
Larch Mountain salamander (<i>Plethodon larselii</i>)	Y	N	Y	NI
greater sandhill crane (<i>Gus canadensis tabida</i>)	N	-	-	NI
harlequin duck (<i>Histrionicus histrionicus</i>)	N	-	-	NI
black rosy finch (<i>Leucosticte atrata</i>)	Y	Unk	Y	MIIH
ferruginous hawk (<i>Buteo regalis</i>)	N	-	-	NI
Cope's giant salamander (<i>Dicmptodon copei</i>)	N	-	-	NI
red-legged frog (<i>Rana aurora</i>)	N	-	-	NI
Protection Buffer Species				
white-headed woodpecker (<i>Picoides albolarvatus</i>)	N	-	-	NI
black-backed woodpecker (<i>Picoides arcticus</i>)	Y	Unk	Y	MSG
pygmy nuthatch (<i>Sitta pygmaea</i>)	N	-	-	NI

flamulated owl (<i>Otus flammeolus</i>)	N	-	-	NI
great gray owl (<i>Strix nebulosa</i>)	N	-	-	NI
Survey and Manage (C3) Species				
Dalles Sideband (<i>Monadenia fidelis minor</i>)	Y	N	Y	NI
Puget oregonium (<i>Cryptomastix devia</i>)	Y	N	Y	NI
Columbia oregonium (<i>Cryptomastix hendersoni</i>)	Y	N	Y	NI
Evening fieldslug (<i>Deroceras hesperium</i>)	Y	N	Y	NI
Malone jumping-slug (<i>Hemphillia malonei</i>)	Y	N	Y	NI
blue-grey tail-dropper (<i>Prophysaon coeruleum</i>)	Y	N	Y	NI
papillose tail-dropper (<i>Prophysaon dubium</i>)	Y	N	Y	NI
Crater Lake tightcoil (<i>Pristiloma arcticum crateris</i>)	Y	N	Y	NI
Larch Mountain salamander (<i>Plethodon larselii</i>)	Y	N	Y	NI

1. See narrative. 2. The last surveys were conducted in 1994.
N = No Y = Yes Unk = Unknown
NE = No effect NI = No Impact
MENL = May affect, not likely to adversely affect
MEL = May affect, likely to adversely affect
MIIH = May impact individuals or habitat, but not likely contribute to a trend towards federal listing or a loss of viability to the population or species
MSG = Meets standards and guidelines

Cumulative Effects to Wildlife

Wildlife used this area in its natural state. Seventy-seven percent (2654 acres) of the area were covered with trees. Natural openings (wet meadows, dry meadows, snow, rock, ice) were interspersed with timbered areas. Wind, rain and fire were the major disturbance elements to this area. Fire has a return interval of 170-430 years in the lower elevations of the ski area with large fires (1000 + acres) and 200-300 intervals in the upper elevations with smaller fires (less than 1000 acres). Wind and rain had more frequent events but of less severity than fires.

Big Game (deer, elk, bear and cougars) were impacted in much of the East Fork Hood River and White River drainages, primarily by recreational activities and timber sales. To some extent, all big game migration routes within the Hood River, White River and Santiam Management Units were impacted by cumulative development. Mt. Hood Meadows Ski Area had not been developed, thus the migration routes, fawning and calving areas, meadow forage areas and timbered cover areas were being utilized by big game.

Timber dependant species such as the spotted owl, goshawk, marten, wolverine, varied thrush, hermit warbler, woodpeckers, pileated woodpeckers and cavity users were thriving in this natural timbered state. This proposed lift project will only remove .2 acres of trees in four different timber patches. This would only add less than .1% to the 391 acres already removed in past activities. This proposed project would have minimal effects on wildlife.

Wildlife habitat was lost and disturbed by past ski area development, reducing the carrying capacity of both the permit area and lands in the vicinity. Currently, sixty-five percent (2263 acres) of the permit area is timbered. Three hundred and ninety-one timbered acres have been removed for ski area development thus far.

Big Game (deer, elk, bear and cougars) were impacted in much of the East Fork Hood River and White River drainages, primarily by cumulative ski area development, other recreational activities and timber sales. To some extent, all big game migration routes within the Hood River, White River and Santiam Management Units were impacted by cumulative development. Non-disrupted routes will likely experience increased use by animals displaced from other routes. Displacement from historical habitat will overload adjacent areas, resulting in some population reductions in the long term. Timber harvesting and conversion of timber to agricultural use on private lands has resulted in an accelerated reduction in winter habitat over the last fifteen years. This trend is slowing down as reduced timber harvest has occurred over the last five years.

Clearing of ski runs and consequent creation of meadow forage was thought to provide some benefit in terms of forage for big game; however, field observations during 1988 and 1989 are contradictory. In 1989, the amount of browsing in the upland ski runs was very low, compared to the very intense use of all the wetland meadows utilized by big game.

In terms of non-game species, cumulative actions may cause reductions in the number of some individual species and the increase in the number of other species within the local area. These reductions will be most significant for old-growth species. More opportunistic species may increase, which will lead to further decreases in other populations through competition and reduction in carrying capacity.

Some species make heavy summertime use of the ski runs and are probably present in higher numbers now than they were prior to development. Species which have declined in response to the forest clearing are primarily the old growth and mature forest species such as spotted owl, goshawk, marten, wolverine, varied thrush, hermit warbler, woodpeckers, pileated woodpeckers and cavity users.

Mitigation Measures

Neo-tropical birds may be nesting May 1 through July 31. To protect breeding birds, the cutting of trees should occur outside that time period; e.g., the fall before construction, before May, or the stands may be surveyed for nesting birds prior to cutting.

AQUATIC/FISHERIES RESOURCES

Forest and MHM Master Plan Requirements

Relevant Standards and Guidelines from the MHNF's Land and Resource Management Plan

See hydrology, botany and soils sections respectively for discussion on relevant Standards and Guidelines.

Existing Conditions

There are no fish living in the East Fork Hood River and Mitchell Creek within the MHM permit area. Fish presence/absence surveys have been conducted using electrofishing gear in both streams (Figure 3-1). Sahalie Falls, an impassible upstream migration barrier located approximately 1.5 miles downstream from the main base, prevents fish from ascending the East Fork Hood River. Mitchell Creek is a perennial non-fish bearing tributary entering the East Fork Hood River immediately downstream from Sahalie Falls and Highway 35.

Steelhead trout *Oncorhynchus mykiss*, listed as threatened as part of the Lower Columbia River Evolutionary Significant Unit, are found in the East Fork Hood River but none have ever been documented upstream from Cold Springs Creek, about 9.5 miles below Sahalie Falls. There are, however, no known barriers to upstream passage between Cold Springs Creek and Sahalie Falls and the National Marine Fisheries Service lists that reach of stream as critical habitat. Bull trout *Salvelinus confluentus*, also listed as threatened, have never been found in the East Fork Hood River watershed within the Mt. Hood National Forest and are not considered permanent inhabitants of the drainage, but there have been sporadic sightings in tributaries near the mouth of the East Fork. Coastal cutthroat trout *O. clarki*, proposed as threatened, are found in the upper East Fork Hood River and tributaries below the confluence with Mitchell Creek.

We surveyed for four caddisflies that formerly were on the Forest Service Region 6 sensitive species list.

Cascades apatanian caddisfly *Apatania tavala*

Mt. Hood brachycentrid caddisfly *Eobrachycentrus gelidae*

Mt. Hood farulan caddisfly *Farula jewetti*

One-spot rhyacophilan caddisfly *Rhyacophila unipunctata*

None of these species have been found in the East Fork Hood River and Mitchell Creek within the MHM permit area, based on surveys conducted in 1991-1993, 1995 and 1997 at various sites within these two drainages (Figure 3-1). In 1997, additional sites throughout the MHM permit area, including sites within the Mitchell Creek and East Fork Hood River drainages, were briefly examined but not surveyed because the habitat appeared unsuitable for these species (Wisseman 1997). Note that the surveys conducted in 1997, in particular, were cursory in nature – designed to quickly establish the possible presence of the above species. Positive absence of the above species cannot be guaranteed with this survey method. However, it is the professional judgment of the Hood River Ranger District fisheries biologist that there is a low likelihood that these four species reside in Mitchell Creek and the East Fork Hood River within the MHM permit area, primarily because much of the habitat appears unsuitable. Note that a cursory examination was conducted on August 10, 2000 in a small tributary to the South Canyon tributary to the East Fork near the top of the Daisy chairlift where a lift terminal and some riparian reserve tree removal is proposed. No aquatic insects were found.

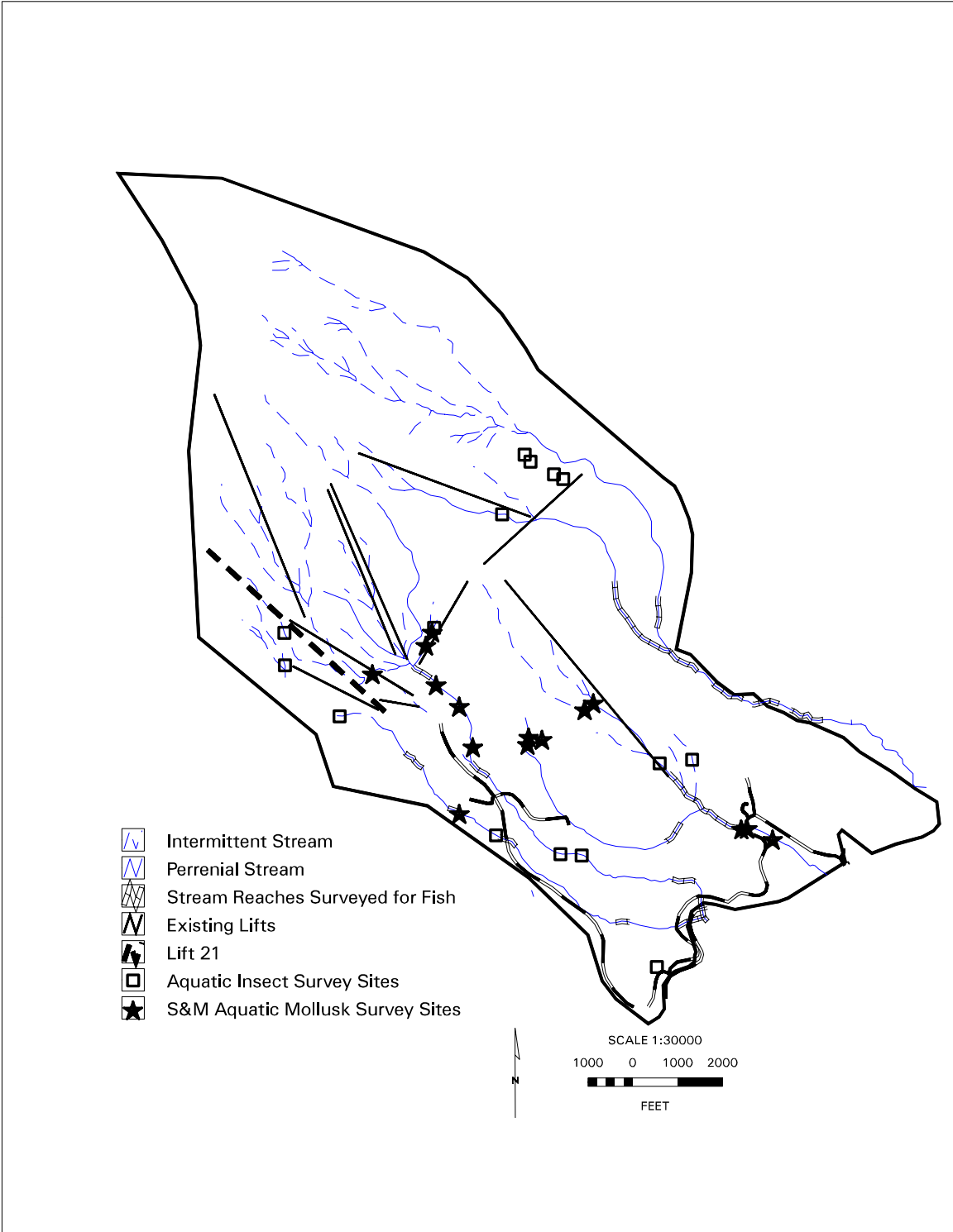


Figure 3-1

The two survey and manage aquatic snails the Mt. Hood National Forest is required to survey for, basalt Juga *Juga (oreobasis)* new sp. 2 and Columbia duskysnail *Lyogyrus* new sp. 1, have not been found in the East Fork Hood River or Mitchell Creek drainages within the MHM permit area. Surveys for these two species were conducted at various sites throughout the permit area during 1998 and 1999 (Figure 3.1).

There are no known water bodies within the MHM permit area that qualify as sport or commercial fisheries. However, streams within the permit area are important to downstream fisheries because they provide cold, clean water.

Effects

The following discussion applies to the Mitchell Creek and South Canyon tributary 7th field watersheds, unless otherwise noted. The South Canyon tributary is one of the primary streams making up the headwaters of the East Fork Hood River within the Mt. Hood Meadows permit area. These are the two watersheds where the proposed Lift 21 would be located.

Direct and Indirect, Short & Long Term Effects of the No Action Alternative - Alternative 1

The present distribution and abundance of aquatic fauna within Mitchell Creek and the South Fork tributary (and the East Fork Hood River downstream) would remain the same under this alternative. There would be no direct, indirect, long or short term effects on fishery resources and other aquatic sensitive and survey and manage species, or their habitat, as a result of not building Lift 21.

Direct and Indirect, Short & Long Term Effects of Constructing Lift 21 - Alternative 2

Potential effects to fish, survey and manage aquatic mollusks and their habitat, as a result of Lift 21 construction and operation could result from three primary mechanisms: soil disturbance (and subsequent erosion into streams), riparian vegetation removal/alteration, and changes in stream flow timing and magnitude. These three mechanisms are discussed separately below. A summary of effects is outlined in Table 3-12.

Table 3-12.

SPECIES NAME	Legal Status	Species Present	Habitat Present	Alt. 1, No Action	Alt. 2, Prop. Action
Columbia River bull trout <i>Salvelinus confluentus</i>	T	No	No	NE	NE
Lower Columbia River steelhead trout <i>Oncorhynchus mykiss</i>	T	No	No	NE	NE
Lower Columbia River cutthroat trout <i>Oncorhynchus clarki</i>	PT	No	No	NE	NE

KEY:

T = Federally listed as Threatened
 S = Forest Service Region 6 sensitive species
 MIIH = May Impact Individuals or Habitat, but will not likely contribute toward Federal Listing or loss of viability to the population or species.
 PT = Federally proposed as Threatened
 NE = No Effect
 NI = No Impact

- **Soil Disturbance**

A thorough discussion of effects to soil resources is presented in section 3.2 of this document. It is clear that potential effects from Lift 21 would be minimal (immeasurable at the permit area scale) and short term in nature. Proposed mitigation is designed eliminate soil erosion from both wind and water. The only two locations where eroded soil could potentially enter perennial streams is at the two tower locations located within 50 feet of the South Canyon tributary and one of its feeder streams; one is near the base of the proposed lift and the other is near the upper Daisy lift terminal. As stated in the soils discussion, the chance of eroded soil moving more than a few feet is small given proposed mitigation for disposing of waste materials on the temporary road.

There would be no effect to Federally threatened or proposed threatened fish species or critical habitat in terms of sedimentation from Lift 21 because additional sediment, if any, would be immeasurable at the 7th field or higher watershed scales and the fact that the project area is 1.5 miles or more upstream from fish bearing stream reaches. There would be no impact to survey and manage aquatic mollusks – individuals or habitat.

- **Riparian vegetation removal/alteration**

Of the estimated 0.2 acres of proposed tree removal, totaling about 75 trees, only 10-20 of these are located within a riparian reserve. This is in the same area described above for tower placement near the top of the Daisy lift. The riparian reserve trees are set back 20-30 feet from the small stream (1-1.5 feet wide) flowing there and are all on the north side. Since these trees are to the north of the stream they do not provide any stream shade and their removal would have no effect on stream temperature.

The elevation at this site is about 6,100' and it is an alpine/subalpine ecotone. Large wood is not a dominant stream channel forming or maintaining element in the alpine zone, although if a tree were to fall across or into a stream there could be localized channel adjustments – depending largely on the size of the stream, the drainage area above it, and size and location of the tree. This stream is quite small and lacks the stream power to transport wood of any size downstream. After site inspection it was clear that this stream was located primarily in open, meadow areas and in many places was incised because of the loose, sandy soils. Down trees across the creek were not evident. To summarize, the removal of the 10-20 trees would have a negligible impact on channel forming processes and future amounts of in-channel wood both at the site and at the 7th field or greater watershed scale. Similarly, effects to fish and other aquatic faunal species and their habitat would be negligible.

- **Stream flow**

The risk of increased peak flows resulting from tree removal and road building is low (see Hydrology, section 3.3). There would be no effect to fish or other aquatic faunal species or habitat resulting from changes in the flow regime in the analysis area or downstream.

Cumulative Effects to Aquatics and Fisheries

Cumulative effects associated with the installation and operation of lift 21, as they relate to TES and survey and manage aquatic species, are negligible. The terrain accessed by the lift is already skied on and groomed so any cumulative effects are from the construction and operation of the lift itself. Lift 21 would not effect the distribution or abundance of aquatic species within the Mitchell Creek and South Canyon tributary 7th field watersheds, nor would it effect distribution or abundance of aquatic fauna downstream from the permit area. Although there is a very slight chance of some site-specific impacts to aquatic macroinvertebrate habitat from increased fine sediment, cumulatively at the South Canyon tributary and Mitchell Creek scales these are immeasurable.

Removing trees from riparian reserves would increase the total amount of riparian area disturbed both within the analysis area and MHM permit area. The additionally disturbed area, however, would be less than 0.1% of the existing disturbed riparian area within the analysis area and less than 0.01% in the MHM permit area as a whole (Figure 3-2). The currently disturbed riparian reserve area is already less than 3.0% of the total amount of riparian reserve within the analysis area and includes both perennial and intermittent streams. Considering water temperatures, the amount of past riparian reserve disturbance is quite small, especially considering that some of the riparian reserve disturbance was along intermittent streams which generally do not have water flowing during the warm summer months. Water temperatures increases from past vegetation removal would be immeasurable given the low amount of disturbance in the analysis area. Removing trees from riparian reserves for Lift 21 would not change water temperatures nor would riparian and stream function, in terms of in-channel wood, be altered.

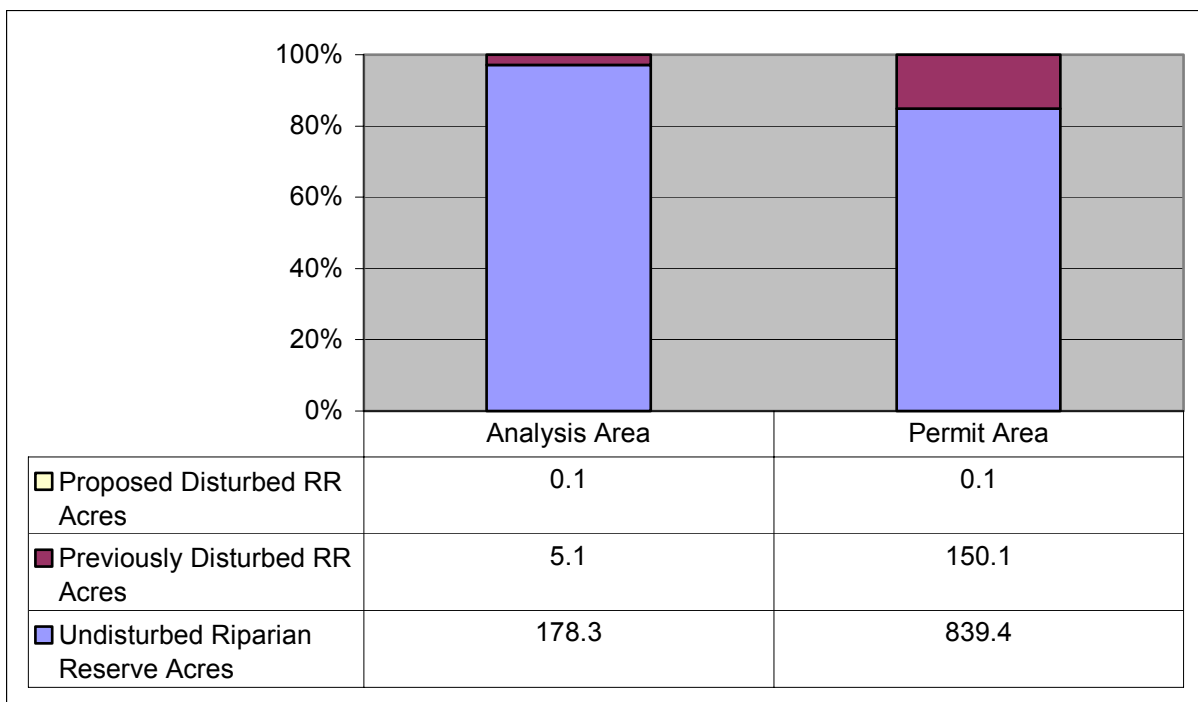


Figure 3-2. Acres and percent of proposed disturbed, previously disturbed and undisturbed riparian reserves in the analysis area (Mitchell Creek and South Canyon Tributary) and Mt. Hood Meadows

permit area. For the purposes of this analysis, disturbed acres are those where trees have been removed, roads built, or buildings and other structures placed. Data used was from Hood River Ranger District GIS information. Proposed disturbed riparian reserve acres from Lift 21 are so small they do not show up on the graph.

Mitigation Measures

Trees felled within riparian reserves should either remain on site or be stockpiled for later placement in and along streams within the permit area under the direction of the district fisheries biologist or hydrologist.

Scenery Resources

Forest and MHM Master Plan Requirements

Relevant Standards and Guidelines from the MHN's Land and Resource Management Plan

... developed downhill ski areas, and other developed facilities shall achieve Partial Retention VQO in the foreground, middleground, and background distance zones as viewed from (Hwy 26, Hwy 35, and old Hwy 35). **A11-017.**

The prescribed VQO should be achieved within one year after completion of any project activities. **FW-556.**

The foreground as viewed from the Timberline and Umbrella Falls trails was changed to a VQO of Modification in the 1997 ROD, page 15.

The Proposed Action, Lift 21, will be analyzed for scenery impacts from the following critical viewpoints: Umbrella Falls Trail; Timberline Trail; Timberline Lodge; Hwy. 26; Hwy. 35, and old Hwy. 35.

Existing Conditions

Development activities at Mt. Hood Meadows over 30 years have left the landscape in a noticeably changed condition. Ski trails, lift corridors and buildings all make for visibly modified view. Some specific areas have not responded to revegetation work as well as others, so a little bare ground is still visible (bottom of Cascade, pieces of Shooting Star trails). Under the original Forest Plan, some parts of the ski area did not meet the prescribed visual quality objectives as viewed from the hiking trails. The 1997 ROD and Master Plan changed the VQO to Modified when the Forest recognized it was nearly impossible to have retention or partial retention VQOs within a developed ski area. A Modification classification allows the activity to visually dominate the natural landscape, but must borrow form, line, color and texture from that landscape.

Concerns

The following are areas of concern to be analyzed: vegetation management; ground surface disturbance; facility materials/color selection; facility form blending w/landscape; and underground facilities.

Direct and Indirect, Short & Long Term Effects of the No Action Alternative - Alternative 1

This alternative will create no negative scenery impacts as Lift 21 will not be constructed and the landscape will remain as it is now.

Direct and Indirect, Short & Long Term Effects of Constructing Lift 21 - Alternative 2

The Proposed Action, Lift 21, will be visible or not visible from the critical viewpoints as follows:

Umbrella Falls Trail –

lower terminal ---- Not visible

upper terminal ---- Not visible

towers / lines ---- Yes, one or two towers near the middle;
therefore, **meets the Modification VQO.**

Timberline Trail –

lower terminal ---- Yes, visible

upper terminal ---- Not visible

towers / lines ---- Yes, three or four at the lower end;
therefore, **meets the Modification VQO, yet does not dominate the landscape.**

Timberline Lodge –

Not visible -- screened by ridges except 2-3 towers which would not be evident to a casual observer

therefore, **meets the Partial Retention VQO given lack of being seen**

Hwy 26 and old Hwy 35 –

Not visible -- screened by ridges and vegetation;

therefore, **meets the Partial Retention VQO because it cannot be seen**

Hwy 35 –

Due to distance and earthtone colors only the top terminal **may** be evident, but not to the casual observer;

therefore, **meets the Partial Retention VQO because it blends well.**

Mitigation Measures -- (1997 ROD, Visual [Scenery] Resource Mitigation) See mitigation list in appendix.

Vegetation Adjustments

Mitigation Measures 2, 3, 4, and 5 are being met by the Proposed Action: The screening potential of existing vegetation is maximized; no clearing patterns of straight lines or geometric shapes are used;

leave islands of existing vegetation are retained; and existing openings are utilized to reduce loss of existing vegetation.

Ground Surface Disturbance

Mitigation Measures 6, 7, and 20 are being met by the Proposed Action: Contour grading will blend the lower and upper terminal sites into the existing landscape; temporary road construction will minimize cut/fill slopes; large excavated rocks will be redistributed in natural patterns; and ground disturbance as seen from the Timberline and Umbrella Falls Trails will be minimized.

Facility Materials / Colors Selection

Mitigation Measures 8, 9, and 21 are being met by the Proposed Action: Non-reflective materials and medium, warm gray earthtone colors will be used on the lower and upper terminals and on intermediate towers and chairs.

Facility Form Blending w/Landscape

The Proposed Action is meeting mitigation Measures 12 and 13: The lower and upper terminals will be located within the trees (vegetative screening) and below the ridgeline (topographic screening), respectively.

Underground Facilities

Mitigation Measure 15 is being met by the Proposed Action: Lift power lines will be buried under the temporary road.

Cumulative Effects to Scenery Resources

No large clearings are created as this lift line follows existing ski runs and natural openings. Less than ¼ acre of trees (approximately 75 trees) will be removed from four existing clumps at four different locations. The removal of these trees will not be evident from critical viewpoints, which meets the internal and external VQO's. The small change in the tree line at the bottom terminal will not greatly add to the cumulative impact of created openings. The lift itself will add cumulatively to the list of mechanical equipment viewed by hikers on the Timberline trail as this lift would make for a total of 6 chairlifts passing over the Timberline trail. Lift 21 would not add to visual impacts for viewers off the ski area because the only thing visible from Hwy 35 would be the top terminal which would not be noticeable by a casual observer.

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CULTURAL RESOURCES

Forest and MHM Master Plan Requirements

Relevant Standards and Guidelines from the MHN's Land and Resource Management Plan

Cultural resource inventories shall be completed during the project planning stage ... for all proposed projects that may potentially affect a cultural resource (36 CFR 800.3c). **FW-606.**

Acreage surrounding the proposed lift line was surveyed by meandering transects of less than 20 meter intervals. In addition, the portion of the Timberline Trail (666EA002) adjacent to the proposed lift line was examined to gain as accurate a picture as possible of the visual impact the project would have on that section of the trail. The ridgeline on which the proposed upper terminal would be located was closely inspected from above the proposed terminal (elev. 6800') to its termination (elev. 6200') due to a prehistoric isolate (666IS216) having been located on that ridgeline by the District Botanist. No new lithics were located during this survey, but a historic fire ring was located on the ridgeline to the east of the proposed lift line (666EA218). No other cultural resources were observed.

Cultural resources considered eligible for the Natural Register of Historic Places shall be protected by avoiding adverse impacts to the resource site or by conserving the values through proper scientific study and/or data recovery. **FW-615.**

The prehistoric isolate recorded during the cultural resource inventory for this project is located well outside of any areas to be impacted by this project. The historic site discovered (666EA218) is near the proposed alignment of a temporary road to be constructed as access for the construction of the top terminal of Lift 21. Before road construction begins, this site will have a 50' buffer flagged around its perimeter by an archaeologist or cultural resource technician from this district.

When impacts to cultural resources cannot be avoided during project implementation, mitigation shall occur. **FW-618.**

Mitigation measures to reduce additional visual impacts on the Timberline Trail viewshed by the proposed project include:

- *Avoid crossing the Timberline Trail with heavy equipment during felling operations and tower construction.*
- *Feather the edges of the corridor that will be cut through the groves of trees to avoid harsh, unnatural linear effects.*
- *Flush cut all stumps at an angle away from the trail.*
- *Scatter slash that results from this project within the remaining tree groves, or haul it away. Consideration should be used in the type of machinery chosen for the task in order to cause no further ground disturbance.*
- *Re-vegetate areas of ground disturbance using native plants, some flowering.*
- *No tower should be within 100' of the trail, a greater distance if possible.*
- *Paint lift towers in warm grey tones (like tree bark color).*
- *Stain concrete pads a dark, neutral color. If the ones closest to the trail are one foot or*

more above the grade, they should be textured.

- *Paint the chairs a neutral color.*
- *All removable items, such as chairs and signs, need to be out of the Timberline Trail viewshed after every ski season.*

Should employees of Mt. Hood Meadows Ski Resort, one of their contractors, or anyone employed by their contractors discover any prehistoric or historic cultural remains, work within that area must stop and an archaeologist or cultural resource technician from the district must be notified immediately.

Existing Conditions

Two miles of the Timberline Trail extends southwest to northeast through the center of the Mount Hood Meadows permit area. This trail has been determined to be eligible to the National Register of Historic Places (NRHP). The trail was originally planned, designed and built as a system with shelters placed at about four-mile intervals. Subsequent feeder trails were built with the intention to provide radial access to the Timberline Trail. Within the permit area, the Umbrella Falls Trail is such a trail. Timberline Trail has been regularly maintained and areas have been rerouted over time. Five of the original nine shelters have collapsed, including the one located within the permit area (this shelter was identified in the draft Timberline Trail nomination as not eligible to the National Register). The wilderness character of the trail is only interrupted when it passes through the Mount Hood Meadows and Timberline ski areas (7 percent of its length). The two-mile segment of the trail that runs through the Mount Hood Meadows permit area is currently crossed by five ski lifts, two service roads and one skid road.

As viewed from the Timberline Trail and the Umbrella Falls Trail, the 1997 ROD has amended the foreground VQO within the permit area boundary for the Mount Hood Meadows Master Plan Expansion from Partial Retention to Modification (ROD p15). A Modification classification allows the activity to visually dominate the natural landscape, but must borrow form, line, color and texture from that landscape.

Direct and Indirect, Short & Long Term Effects of the No Action Alternative - Alternative 1

Not building Lift 21 would result in no impacts to cultural resources.

Direct and Indirect, Short & Long Term Effects of Constructing Lift 21 - Alternative 2

An important factor from a cultural resources perspective is the Timberline Trail (666EA002). This trail, built by the Civilian Conservation Corps in the 1930's, has been identified as eligible for the National Register of Historic Places, with the scenic quality of the view from the trail listed as one of its significant features. This requires protection of its "setting" as well as the tread itself. Forest Plan standards (Forest Plan Amendment No. 10, 1997) call for achievement of a Visual Quality Objective of Modification (meaning human created changes to the landscape dominate over natural character) for the Timberline Trail within the Mt. Hood Meadows permit area. The proposed project will create additional

alteration to the view-shed, however, the currently proposed location crosses the trail near the Daisy ski lift, concentrating the visual impact in a previously impacted area rather than modifying a new view-shed. Though tree removal will be seen from the Timberline Trail, the impact will not be defined, even for the recurrent hiker. The mitigations, as included, will assist in minimizing the alterations, as the significance of the view-shed is both historic and continuing.

Another important factor from a cultural resources perspective is the removal of nine small “krummholz” whitebark pine (*pinus albicaulis*) from the proposed top terminal location. Whitebark pine is an important traditional food resource to Native Americans particular to members of the Confederated Tribes of the Warm Springs. Planting twenty-five whitebark pine seedlings last summer within the Mt. Hood Meadows permit area would help to mitigate this loss.

Cumulative Effects to Cultural Resources

The natural landscape within the permit area would be further altered under the action alternative, particularly where the top and bottom terminals are constructed. The visual character of the mountain landscape would become more dominated by man-made lines and objects, reducing the natural character of the landscape. However, the currently proposed lower terminal location is in a developed area near other lift terminals, and the additional visual impact at that location would be negligible. The proposed lift line would cross the Timberline Trail near the Daisy ski lift, concentrating the visual impact to the trail in a previously impacted area rather than modifying a new view-shed. Though some tree removal would be seen from the Timberline Trail, the mitigations, as included, would assist in minimizing those alterations. In addition, ethnographic studies and past consultation with the Tribes indicate that while Native people continue to use the existing permit area, some of the traditional activities have been displaced into the White River area and others have been totally lost. While there has been some coexistence between the traditional users of the area and the existence of the ski area, the evidence is that the traditional uses and resources have been and will continue to be compromised by the presence of ski area development. The proposed project, while an addition to the ski area, will not noticeably compromise the traditional use of the area more than has already occurred. Based on the analysis and proposed mitigation, the proposed action will have no adverse effect on cultural resources.

Recreation Resources

Forest and MHM Master Plan Requirements

Relevant Standards and Guidelines from the MHNF's Land and Resource Management Plan

Development ..., administration, occupancy, and use of developed sites and facilities shall be consistent with Management Area management direction. Project specific conditions and specifications for developments shall be determined via planning and environmental analysis for master plans (FSM 2341) and/or special use permits. **A11-011/012.**

The development of new, or expansion of existing, recreation sites, facilities and trails may occur and should be located to protect riparian values. **B7 General Riparian Allocation; B7-001**

Trails and recreation sites should avoid special aquatic and terrestrial habitats (side channels, ponds, wetlands). **B7-003**

Existing Conditions

Growth in downhill skiing has occurred at MHM. Since opening in 1967/68, the number of skier visits has grown from 55,564 to a high of 378,000 in 1998/99. During the 1970's the average annual rate of growth was twice the Oregon average at 4.6%. Between 1984-1989, the average annual rate of growth has been 2.14%, with an annual average of 325,000 skier visits. MHM's share of the total Oregon and Washington skier market has increased from 6% in 1970 to 11.81% in 1987, a compound growth rate of 4.06%.

In 1999/2000, the ski area saw an increase in beginning skiers/riders of 22% over the previous season and a 71% increase since 1995 according to the ski area. MHM anticipates this trend to continue if the demand can be met with facilities and terrain to accommodate the use.

Concerns

A public commenter was concerned about noise impacts to recreationists using the Timberline trail or hiking in the wilderness immediately above the construction project.

Effects

Direct and Indirect, Short & Long Term Effects of the No Action Alternative - Alternative 1

If the lift is not constructed, the purpose and need of providing additional beginner terrain with an above timberline experience will not occur. The novice skiers and riders would continue to use the Buttercup/Red area where congestion risk for accidents is growing. MHM would have to reduce the instruction and services to these users in order to maintain a safe environment and not meet the growing demand.

Direct and Indirect, Short & Long Term Effects of Constructing Lift 21 - Alternative 2

Constructing Lift 21 will enable MHM to better provide for current and long-range demand for beginner/novice terrain. The lift would give the additional terrain needed to meet demand from users, and would offer the new experience of above timberline skiing. Lift 21, like Cascade Express, would be a high elevation lift with greater exposure to high winds and icing. Because of weather, the lift may only operate 60-70% of the season. If the lift is not open on busy weekend days, all novice skiers and riders will be forced to contain themselves on the Buttercup and Red chairlift slopes that can become crowded again.

During construction of the lift, some hikers on the Timberline trail and any hikers/climbers above the area in wilderness would hear the noise of the operation. Most of the noise would come from helicopters pouring concrete and setting towers. This noise disturbance would occur roughly between July and October. There have been no major construction projects at MHM for two years, so there have not been noise effects to hikers for that period of time. The noise impacts to trail hikers is short as they walk through the ski area. Anyone hiking cross country above the ski area could experience the longer, but the agency does not try to buffer the effects of non-wilderness activities from wilderness users.

Cumulative Effects to Recreation

The cumulative effects on users under the action alternative would be additional terrain for the users to ride and ski.

If no action is taken, the cumulative effects on the winter sports users at MHM are those of increasingly crowded conditions on the beginner and novice terrain.

Independent Utility of Lift 21

The proposed new lift is meant to relieve congestion amongst existing users on beginner/novice terrain and to offer users a high altitude experience. The balance of skiers has been shifting toward the beginner/novice business, but the numbers of all ability types is not currently exceeding the ski area's capacity. This lift was not conceived to serve an increase in total area users, nor is it meant to directly increase the area's capacity. Area capacity is constrained by parking. Lift 21's success in meeting the underlying needs of the project is not reliant on an increase in parking.

Other Applicable Laws and Regulatory Requirement Disclosures

Wild and Scenic Rivers

There is no Wild and Scenic Rivers within the Mt. Hood Meadows permit area, but the project area is immediately above the White Wild and Scenic River. The management plans for that river states that skiing into the corridor from Mt. Hood Meadows should be discouraged. Hence, Mt. Hood Meadows will not be authorized to encourage skiers or riders into the corridor, nor lead guided trips into the corridor. Skiers have historically skied into the corridor, down to Hwy 35 and the ski area will discourage this practice with boundary management signing if Lift 21 is built.

Effects to Wetlands and Floodplains

There are no wetlands and flood plains within the project area (reference 11/3/00 letter from Corps of Engineer) except for a small wetland at the top of Daisy that Lift 21 would span over.

Compliance with Executive Order 12898 Regarding Environmental Justice

On February 11, 1994, President Clinton issued the Executive Order on Federal Actions to address Environmental Justice in Minority Populations and Low-Income Populations (Executive Order 12898). In accordance with this order, the proposed action has been reviewed to determine if it would result in ... disproportionately high and adverse human and environmental effects on minorities and low-income populations.

A public information effort to inform and involve the potentially affected and interested individuals, agencies or organizations occurred when the project was scoped for public input. No specific concerns regarding minorities or low-income families were identified during the public information process.

Employment and Consumers

MHM currently averages 50 full-time employees year-round. At the peak of the ski-season (last two weeks in December), up to 550 persons are employed, decreasing to an average 450 employees during the middle of the season (December-March), then to 300 at the beginning and end of the season.

The proposed construction of Lift 21 would provide more skiable terrain and a slight increase in skier numbers (novice and beginners) to MHM. This potential increase in use would increase employment opportunity at MHM by 3-4 positions to operate the chairlift. Temporary employment opportunities would be available for construction of the lift.

Compliance With the Clean Air Act

The Hood River Ranger District lies in the Central Oregon Intrastate Air Quality Control region. In accordance with the Clean Air Act (P.L. 88-206) as amended, this region is classified according to the amount of air degradation that can be permitted. All of the Ranger District, including Mt. Hood Meadows permit area, is considered as a Class II air shed. The Hood River metropolitan area is considered a "smoke sensitive area" and the Columbia River Gorge National Scenic Area a "high recreational use area". Both are class II air sheds that require "the prevention of any future, and the remedying of any existing, impairment of visibility.

A major contributor to air quality degradation is slash burning. On the Mt. Hood National Forest the amount of smoke put into the air is controlled through cooperation with the Oregon State Department of Environmental Quality (DEQ). Burns are registered with DEQ. DEQ controls the timing and amount of smoke that would be put into the air at any one time. Through this procedure, air quality standards are maintained.

No slash burning is anticipated with this project. Slash from the estimated 75 trees felled for the construction of Lift 21 would be lopped and scattered. No degradation of air quality will occur.

Compliance With the Clean Water Act

Compliance with State Water Quality Standards, and therefore the Clean Water Act, is ensured through adherence to Best Management Practices (BMP's). The Forest Service in Region 6 has entered into a Memorandum of Understanding with Oregon's Department of Environmental Quality (DEQ) to avoid duplication of effort and to provide the necessary coordination to meet the implementation requirements of the Clean Water Act of 1972 and subsequent amendments (FSM 1561.5 R6 Supp 47). A generalized list of these BMP's is contained in General Water Quality Best Management Practices for the Pacific Northwest Region (11/88). BMP's are routinely monitored to ensure that they are being implemented as prescribed and that they are effective in meeting State water quality standards. The design and construction plans for the lift would be done in a manner to comply with the BMPs as well.

Migratory Bird Treaty Act

By following the mitigation measure outlined in the wildlife section, no birds will be disturbed during the nesting season. This would put the proposed project in compliance with the Migratory Bird Treaty Act.

Irreversible and Irretrievable Commitment of Resources

Irreversible commitment of resources refers to non-renewable resources, such as cultural resources, or those items that are renewable only over a long time span such as soil productivity. Irretrievable commitment applies to losses of production, harvest or use of renewable natural resources. No significant irreversible or irretrievable commitments of resources have been identified with the implementation of this proposed action.

Chapter 4 Consultation and Coordination

Consultation with the US Fish and Wildlife Service

Consultation for bull trout is not required because there will be No Effect on bull trout individuals or habitat as a result of proposed project activities.

Consultation for spotted owls and bald eagles is not required because there will be No Effect on either of these two species, or their habitat, as a result of proposed project activities.

Consultation for lynx has started because a finding of "May Effect, Not Likely to Adversely

Effect” determination has been made for transient individuals as a result of the proposed project activities.

Consultation with the National Marine Fisheries Service

Consultation for steelhead trout is not required because there will be No Effect on steelhead trout individuals or habitat as a result of proposed project activities.

Consultation with the State Historic Preservation Officer

The National Historic Preservation Act and the National Environmental Protection Act both require consideration be given to the potential effect of federal undertakings on historic and prehistoric resources. The guideline for assessing effects and consultation are provided in 36CFR800. To implement 36CFR800, Region 6 entered into an agreement with the Oregon State Historic Preservation Office and the Advisory Council on Historic Preservation. In accordance with this agreement a cultural resource evaluation was conducted for this undertaking and properties, which may be eligible for inclusion in the National Register of Historic Places, have been located. Consultation with the Oregon State Historic Preservation Office is on going.

Consultation with the Confederated Tribes of Warm Springs

The District has called the Tribes to discuss the project and to invite tribal members to visit the proposed lift site on the ground. To date, no response has been received from Warm Springs.

Response to Scoping Comments

As discussed in Chapter 1.0, section 1.6, of this EA, scoping with other agencies and interested parties was conducted for Lift 21. Upon review of public comments received, a number of questions were identified which helped drive the information and data needs of the IDT so that their analysis is responsive to the public concerns raised with this proposed action.

The following summarizes the public concerns and how the concerns were addressed.

Concern #1 – Grooming

What impacts does Lift 21 have on grooming of all ski runs, particular changes in the amount and kind of grooming on nearby runs?

What are the impacts of skiing and grooming on runs that have exposed ground and short vegetation?

What are the impacts of grooming on white-bark pine?

Response: Compaction to vegetation is a natural occurrence given the huge quantities of snow and high moisture content, heavy rains, and a freeze/thaw process from the many

winter storms that pass over the ski area. The additional weight of a snow-cat on this compacted snow base is considered inconsequential to impacting vegetation as no discernable difference to vegetation growth has been observed in August between groomed and un-groomed ski run at Mt. Hood Meadows.

Grooming runs that have exposed ground stirs dirt and vegetation into the snow, thus accelerating it's melting. This also looks unsightly to ski area visitors, and is not good for the snow-cat maintenance.

Groomers occasionally nick white bark pine trees that are buried in the snow. There has been no major tree mortality to white bark pines caused by mechanical damage, however observation by the Permit Administrator over 5 years indicates that perhaps up to 6 trees over ½ acre have been killed by groomers while digging snow out from under the Cascade Express lift. Since this problem was noticed, MHM is careful to not dig deeper than needed to maintain clearance under the chairs for ANSI codes.

Concern #2 - Snow Farming

Snow farming moves snow away from one area, which causes these areas to melt off earlier and thus dry out earlier, and puts it (snow) on another area, which reduces vegetative growing season in these areas. With respect to changing moisture levels, what are the impacts from snow farming on vegetation as snow is moved from one area to another?

What are the impacts of moving snow into white-bark pine and Clark Nutcracker habitat?

Response: Snow farming would be used for Lift 21-served trails like it always has occurred. No great increase in this practice is anticipated. If there is a decrease in soil moisture, mesic forb communities might move toward cushion plant community conditions. If more water were added and retained in the soil, some of the more mesic communities could replace the pincushion species, or some of the understory under the krummholz could shift to favor species that favor moister conditions or later snow melt.

Adding water to sites without much duff/organic matter that could hold it may result in fairly slow community shifts, due to the length of time needed to build soil moisture holding capacity. Direct human impacts to alpine vegetation are often related to changing physical soil structure, or injury to individual plants' shoots or root systems. Groomers have, on occasion, nicked small white bark pine trees with snow-cat blades that are buried with snow near the Cascade Express lift. During the past three years, the equipment operators have made a concerted effort to avoid dozing deep in areas where the trees are found.

Possible changes due to snow farming should produce slower vegetative response than sudden physical changes to soil moisture regimes. Where snow is added to dry pincushion or krummholz sites, tree establishment may be enhanced (Klasner, 1999). Within krummholz patches, tree growth rates and tree cover may increase. Where more snow is laid on to already wet sites, tree establishment may be discouraged. Moist sedge-dominated communities may increase. Changes to the overall character of the krummholz and pincushion patches will not be discernable.

Clark Nutcrackers have been observed in the ski area. Snow farming may impact them by covering up stored seed caches. These birds have a number of seed caches thus reducing the likelihood of any significant impact on an individual bird.

Concern #3 - Krummholtz Ridges, White-Bark Pine & Alpine Pincushion

Krummholtz Ridges, White-Bark Pine & Alpine Pincushion are delicate high alpine ecology areas, which recover slowly, if at all, from disturbances. What are the cumulative impacts to krummholtz ridges, white-bark pine, or alpine pincushion vegetation communities as a result of this proposal? Will Lift 21 further jeopardize the populations of these endemic plant communities with soil disturbing activities?

Response: Pincushion communities naturally occur as patches of vegetation amid bare ground, snow, gravel, or rock. The low growing plants limit vegetation influence on the above ground environment. Edge effects don't extend far to affect air temperature, moisture, or wind speed. While the plants are susceptible to ground disturbance, local impacts are likely to remain confined to the immediate area in the absence of erosion or deposition.

Most impacts to the sparse, patchy krummholz and pincushion communities along the upper half of the lift will occur around lift and road construction, reconstruction, and decommissioning. Such effects are likely to remain tightly localized unless, contrary to projections, summer use increases dramatically. While impacts from soil disturbance (tower sites, road construction/road use) are likely to remain localized, they will probably persist in those delicate, slow to re-vegetate communities. Most vegetation in the project area is protected by snow during ski season, so unless directly disturbed during construction, impacts to these types is not likely to be significant. For additional discussion on this the reader is referred to section 3.4 of this EA. The overall impact to the krummholtz and pincushion areas by this project is quite minimal.

The removal of nine small "krummholz" whitebark pine (*pinus albicaulis*) from the proposed top terminal location has been mitigated by the planting of twenty-five whitebark pine last summer within the Mt. Hood Meadows permit area.

Concern #4 - Vegetation Identification (Under Snow Coverage)

It is impossible to determine effect on vegetation if you don't know what vegetation is there. Impacts cannot be adequately assessed and minimized unless the site-specific analysis is done when the ground is free of snow. How will an adequate assessment and analysis of the area be performed while there is still snow on the ground?

How will all the necessary trees be marked (those required to be fell as part of the construction of Lift 21) while snow remains on the ground?

How can the Forest Service accurately evaluate the damage and potential damage to wetlands, and other elements of this delicate high alpine ecology, from prior photographs and other surveys?

Response: The District deferred the analysis of the proposed lift until the ID Team could visit the site in August when it could see the affected ground.

Concern #5 - Biodiversity

Will the Forest Service do a cumulative analysis that focuses on biodiversity?

Response: While not separately titled “biodiversity” cumulative effects analysis for various resources, including plant communities, and terrestrial and aquatic species are discussed in chapter three of this EA.

Concern #6 - Tree Removal

What are the cumulative impacts of past, present, and the proposed cutting of .2 acres of trees have on the vegetation communities; on the rate and timing of snowmelt and stream flows; on anadromous fish species; and on the health of existing forest and other vegetation?

Response

Vegetation Communities - Tree removal is planned near the boundary between the subalpine forest/meadow mosaic and the krummholtz and pincushion communities. The affected trees are part of a small clump that is effectively all “edge”, i.e. the stand is not large enough to have an unmodified interior microclimate. Stands in the subalpine parkland typically show zonation in the understory, which could be affected by wind, temperature, sun, litter, or soil conditions. Removal of trees in the patch may affect the immediately adjacent understory, but such effects will most likely be limited to the patch itself. There are scattered trees above the site across a snow patch, and a shrub patch to the east. The existing large artificial opening extends downward from the proposed removal site. A patch of trees to the southeast of the proposed cut area is retained. The upper boundary of this forest type is normally a ragged fringe. This pattern is exaggerated by the existing opening, but would have the same character after the proposed tree removal. Effects are likely to be confined to the immediate site.

The tree removal indicated at the bottom of Lift 21 will not significantly increase the impact from construction and maintenance of the existing large highly altered clearing.

Snowmelt and Stream Flows - A peak flow analysis was completed and is included in the Hydrology effects section. In general, the analysis found that there is currently a low risk of increased peak flow from this project due to the small amount of timber proposed for removal and current physical setting in the ski area.

Anadromous Fish Species - Of the approximately 75 trees proposed to be cut within the 0.2 acres, only 10-20 of those trees are located within a riparian reserve. This site is near the top of the Daisy chairlift along a small (1-1.5 foot wide) perennial, non-fish bearing tributary to the South Canyon tributary. The removal of these trees would have no effect on anadromous fish species or habitat because of the extremely small area of disturbance, less than 0.1% of

the total riparian reserve area in the 7th field watershed, and the fact that documented anadromous fish presence is ten miles or more downstream and the upper limit of designated critical habitat is about two miles downstream. This riparian reserve tree removal would have no impact on water temperatures and minimal, if any, impacts to future in-channel wood levels (those potential impacts would only be at the site scale). The stream is too small to be considered a source for in-channel wood downstream because it cannot transport trees downstream.

Wildlife – This proposed project will remove a total of .2 acres of trees in four different timbered patches along the proposed lift. This is less than .1% of the total acres of trees already removed in past development. Tree removal will have the greatest impact on tree dependant species such as woodpeckers and cavity nesters. This proposal will have minimal impact to wildlife.

Concern #7 - Stream and Wetland

Will Lift 21 negatively impact riparian reserves through channelization, soil compaction, and temperature pollution? What are the cumulative effects of previous development and the proposed development on the plant communities within riparian reserves? Are these communities being degraded as a result of these developments?

Are there any streams which lie within or proximate to the impacted area? If so, identify where the stream crossing will lie, and how close the roads are to the stream. Also indicate if any wetland areas lie within or proximate to the impact areas, and how the construction of Lift 21 affects these areas.

Response: An analysis of the effects to soil, water, and fisheries including a description of current conditions is included in Chapter 3 of the EA. In general, the analyses found that detrimental effects to the soil and aquatic resources from this project will be short term and small in magnitude. The proposed road will not cross any streams, but comes within 20 feet of an ephemeral channel near the upper terminal. One delineated wetland exists in the lift corridor, but would be avoided by any tower construction.

Concern #8 - Road Construction

What are the impacts associated from construction of the new temporary road? How will this temporary road be obliterated? What are the effects, and expected impacts of this obliteration? What is the current status of the old Cascade lift road?

Response:

The impacts of the temporary road are discussed in the soils and hydrology sections of this EA. The old Cascade temporary road is fairly well restored and stable – see Soils report on that condition and on proposed obliteration

Concern #9 - Soil Disturbance/Erosion Control

What amount of soil (in cubic yards) will be moved or displaced at each terminal, and at each tower site?

Since erosion methods to date have not succeeded what are the erosion potential and associated impacts with power line construction?

What range of alternatives for erosion control methods have been analyzed?

Have mitigation methods for erosion control (including water bars, straw bales and dams, and lift fences), been successful in past construction activities that have occurred in the Mt. Hood Meadow's permit area? The area's service roads are producing much less erosion now with better maintenance, drainage and rock surfacing. The old "Yellow Cat road" was obliterated and restored and after several seasons, looks very good.

Response: The project proposal describes the amount of ground disturbance and erosion control methods that will be utilized. With respect to ground disturbance, it is estimated that 0.8 acres of new ground would be disturbed, while an estimated 0.7 acres of previously disturbed ground would be "re-disturbed" for a total estimate of 1-1/2 acres of ground disturbance. In addition, an estimated 8,000 cubic yards would require excavation. Most of this excavation, estimated 5,000 cubic yards, would come from the bottom terminal. For a more detailed discussion on the location of ground disturbance areas and cubic yards excavation sites the reader is referred to the soils write-up in chapter 3 of this EA.

While not all past erosion control projects have been successful, our recent hydroseeding experience with the access road, Shooting Star, and the new well have been good. Our general technical knowledge has improved to the point where, with some degree of confidence, we can successfully control any potential erosion that might be associated with the construction of Lift 21. See additional details in the Soils section.

Concern #10 - Visual Resources

What are the impacts on visual resources as seen from White River, the highway (State Hwy 35), Timberline Trail, and the top of the Umbrella Falls trails? Include an assessment of visual impacts that would occur after removal (felling) of all designated trees.

Response:

The proposed action will meet the visual quality objectives as directed by the Forest Plan, and as seen from these travel routes. Regarding the impacts from tree felling, the small groups of trees at four locations will create very minor impacts – most not evident to the casual observer from critical viewpoints. Please refer to 3.6, Effects to Scenery.

Concern #11 - Dispersed Recreation

What are the impacts on skiers and snowshoers who use the area (accessed by Lift 21) for its high-altitudes and minimal encounters with other users?

What is the likelihood of downhill skiers going beyond the permit boundary?

What are the impacts of summer skiing if the ski resort plans to use the lift during the summer months?

Response: : Backcountry skiers and snowshoe enthusiasts will not be overly affected by operation of Lift 21. These people often ascend the mountain through the Texas Trail area going “against the current” of downhill skiers within the permit area, but the two groups have never been in conflict. While they may see more lift-served users than in the past, they themselves are visible enough to not pose a hazard to either.

There will inevitably be skiers going beyond the permit boundary into the White River canyon. The boundary is posted and patrolled against such violations, but people do enter and ski to Hwy 35. The novice skiers served by Lift 21 are not normally interested in off-permit skiing so the number of boundary violations is not expected to increase because of the lift.

There is no proposal for summer skiing at this time. If summer skiing is proposed, it is more likely that MHM would utilize the Cascade Express chairlift.

Concern #12 - Avalanche Control

Will Lift 21 require more avalanche control measures?

Response: No. No avalanche terrain is involved.

Concern #13 - Public Comment Period

The public comment period for this project is far too short. It will be impossible for the public to make informed, meaningful comment on the siting and construction of Lift 21 when the entire area is still under many feet of snow.

Response: The public comment period was extended into the summer months (Public field trip was held on September 6th, 2000) so that they could walk the lift alignment with Forest Service and MHM personnel.

Concern #14 - Noise (as related to Wildlife, and summer recreational use)

The natural “soundscape” of the east side of Mt. Hood is profoundly altered by noise associated with ski area construction, as is the experience of the people using the National Forest. What impacts do resounding noise and the continual disruption from construction year after year have on wildlife, and on the hikers attempting to enjoy the mountain (citing those who use Timberline Trail and other trails, plus the Mt. Hood Wilderness)?

Response: Noise disturbance during construction season is dependent on the cycles of area

development. There was no construction at all in 2000 and the lodge work in 1999 kept noise confined to the base area. Hikers on the Timberline Trail and possibly in the wilderness will hear noise from the Lift 21 construction, especially helicopters or other equipment working close to the trail. This noise impact is temporary assuming the hikers keep moving out of range.

Wildlife Response– The impacts of noise and disturbance from construction year after year on wildlife may disrupt use patterns by wildlife. Wildlife such as elk may move their calving, bedding and foraging areas away from this disturbance. Seasonal operating restrictions are placed on noise related construction activities to protect wildlife during the breeding season (i.e. Spotted owl restrictions when appropriate). No seasonal operating restrictions will be placed on this project because of noise. One seasonal operating restriction will be implemented to protect neo-tropical birds when nesting (May 1-July 31 restriction on cutting trees)

Concern #15 - Need for Proposal

Is Lift 21 needed? The area to be served by the proposed lift can already be accessed by four lifts, three of them for beginners or low intermediate. Every foot is already skiable from existing lifts, though all possibly not quite ideal for beginners.

Rather than do further damage to the sensitive and already stressed area, shouldn't the availability of ski terrain at the other ski areas on Mt. Hood be considered? Summit, Timberline, Ski Bowl, and Cooper Spur have beginner terrain.

Response: MHM saw a 22% increase of beginning skier and rider business in 1999/2000 and a 71% jump since 1995. Timberline, Ski Bowl, and Cooper Spur do offer beginner terrain, however, the purpose and need for this proposal is to address the current beginner/novice lift and skiable acreage capacity deficit at Mt. Hood Meadows. Currently, Meadows has no easy (green dot) beginner terrain that is lift serviced and above tree line. Lift 21 would provide such a service.

Concern #16 - Survey and Managed Species

Before ground-disturbing activities occur there must be surveys for Survey and Managed (C3) species in the appropriate field season, and modifications to the proposal must be made accordingly (if C3 species have been found). Have surveys for C3 species occurred, and have they been timely? Are modifications to the Lift 21 proposal necessary?

Response: Surveys for C3 species deemed to have habitat within the project area have been performed. No C3 species were found.

Concern #17 - Cumulative Effects of Future Ski Area Expansion

Has further expansion of the ski area been included in cumulative effects analysis?

Response: The Forest Service will not do cumulative effects analysis based on conceptual

projects like those in the 1997 Master Plan – only for projects that have been formally submitted for consideration. The only other definitive project proposal within the foreseeable future that the ID Team knows of is the storm water management project for parking lots as required by a settlement agreement with litigants. The team had no formal proposal or details of the storm water system to include in this analysis.

List of Preparers

The following individuals took part in preparing this Environmental Assessment:

<u>Name</u>	<u>Title</u>
Arthur Guertin	NEPA Coordinator/writer/Editor
Doug Jones	MHM Permit Administrator/ID Team Leader
Rich Thurman	Wildlife Biologist
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Sue Nugent	Botanist
Mark Kreiter	Hydrologist
John Dodd	Soil Scientist
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Doni Smith	Archeologist
Gary Loeffler	Landscape Architect

Other references:

General Water Quality Best Management Practices (1977, amended 1987)
East Fork Hood River Watershed Analysis
Mt. Hood Meadows Landscape Analysis and Design (4/12/98)
Lynx Conservation and Assessment Strategy
11/3/00 Letter from Corp of Engineers on Wetlands
Fisheries BA
Botanical BE and Weed Report
Cultural Report

APPENDIX A to Lift 21 Environmental Assessment

The following are mitigation measures required by the 1997 ROD and/or this assessment.

SOILS

Erosion control plans to reduce erosion and soil compaction will be submitted for District Ranger approval for each phase of construction, restoration and maintenance. If construction will take two or more years, interim erosion control methods will be identified. *Included in project proposal.*

Cut and fill slopes will be stabilized by prompt revegetation and grading to an approved slope gradient (about 2:1) or terracing where necessary to reduce the potential of long-term erosion and slope failures. *Included in MHM proposal.*

Land disturbance will be limited to areas to be developed. The acreage that would have to be reclaimed due to construction conveniences will be minimized. *The MHM proposal for disturbance is limited to terminals, tower foundations and the temporary road.*

Construction and grading will be scheduled to minimize soil exposure during periods of snowmelt and rainy periods. *Proposed construction period would end before the heavy rain season of late October.*

To minimize tree stump removal, trees will be flush cut to the extent feasible. *This is now standard for most projects.*

Cut and fill in road and facility construction will be minimized. Cut or fill slopes will be restricted to a 1.5 : 1 ratio, except as specifically authorized by the District Ranger. *This will be the case for the temporary roads...cut slopes will be under 1.5 : 1.*

Lift towers will be installed by helicopter where site-specific analysis indicates a high potential for instability. Pier foundations will be used where stable bedrock materials are within reach of foundations (**geologic hazard mitigation**). *This standard tower design criteria. The design engineer will use geotech help if needed.*

Hydrology

Appropriate hydrologic analysis to assess potential water quality impacts will be conducted as part of the environmental analysis for site-specific development activities.

An analysis of effects to water quality and water quantity has been completed and is displayed in the EA.

Project construction and maintenance activities will be avoided in particularly sensitive areas, areas that are consistently saturated or have perennially shallow water table conditions (i.e. wetlands), and critical areas of groundwater recharge/discharge.

No construction or maintenance activities are proposed in saturated or perennially shallow water tables or areas that have previously been identified as critical for groundwater recharge/discharge.

Significant changes to groundwater movement will be avoided.

No significant changes to groundwater movement are anticipated from this project due to the small amount of disturbance and the shallow nature of any associated excavation.

Appropriate buffers will be established to protect wetland and riparian values for all wetland units and surrounding areas where ground disturbance may have potential impacts on wetland values.

Although no impacts to wetland values are anticipated, Riparian Reserves have been established that are consistent with the Northwest Forest Plan and will meet the Aquatic Conservation Strategy Objectives.

In wet meadow areas traversed by ski lifts and trails, special maintenance plans to minimize disturbance will be prepared for District Ranger approval.

The alignment of the proposed lift avoids any mapped wet meadows.

In all riparian, wetland and other sensitive areas, existing ground cover will be retained and surface disturbance minimized by restricting clearing of ski runs to periods with adequate snow cover. Clearing will occur only when sufficient depth of snow is present (usually 2-3 feet).

This measure is included as part of the existing operating plan.

The Forest Plan requires that road building in riparian areas should avoid sidecasting of material.

VEGETATION

Clearing and construction practices that minimize surface disturbance and vegetation removal will be utilized. *Lift 21 is designed to minimize all impacts.*

Disturbance will be limited in alpine areas and wet subalpine meadows. *The alpine disturbance is minimal and no wet meadows are involved.*

The use of native species for landscaping and reclamation will be encouraged wherever possible in an effort to re-establish native vegetation over time. *Standard operating policy*

Future timber removal in the permit area vicinity will be designed and scheduled to reduce the impacts to the area's recreational and visual values. *Tree cutting is no more than ¼ acre in this project resulting in no scenic impacts.*

During construction, a vegetation protection plan approved by the District Ranger will be used that outlines specific measures safeguarding against accidental or unplanned destruction of vegetation. Leave trees, islands and tree clearing limits will be adequately marked to avoid mistakes in clearing limits during construction. *Will be part of the construction plan*

BOTANY

Buffer zones for populations of *Calamagrostis brewerii* will be approved by the District Botanist on a site-specific project basis, with an average buffer of 200 feet from habitat edge.

Prior to implementing individual master plan elements, Master Plan implementation, additional surveys for C3 surveys and manage species will be conducted and protection standards implemented in accordance with Forest Plan, as amended by the Northwest Forest Plan. *Survey were completed with negative results*

WILDLIFE

Migratory birds will be protected by conformance to the Migratory Bird Act of 1916 and Forest Plan snag standards.

Prior to Master Plan implementation, additional surveys for C3 surveys and manage species will be conducted and protection standards implemented in accordance with Forest Plan, as amended by the Northwest Forest Plan. *Surveys were completed with negative results for the species.*

Ski runs and other vegetation clearings within identified big game habitats will be designed to minimize widths and vertical sight distances. Final design and actual construction of these trails will occur only after a site-specific review. These site-specific design and construction reviews will focus on minimizing long, linear trail cuts without terrain and/or vegetation breaks.

The removal of snags and dead and/or down material will be limited to that necessary to meet safety standards. Other snags and woody material will be left on-site to benefit species dependent upon them as habitat.

Ski trails, lifts and other facilities will be designed to serve as habitat linkages for wildlife species by maintaining the maximum amount of timber and shrub vegetation between timber stands while allowing for safe and quality skiing opportunities. The use of natural openings will be maximized and overstory removal minimized.

AQUATIC/FISHERIES

Prior to Master Plan implementation, additional surveys for C3 surveys and manage species will be conducted and protection standards implemented in accordance with Forest Plan, as amended by the Northwest Forest Plan.

Surveys have been completed throughout much of the permit area. Although many small tributaries and springs have not been surveyed, sites within many of the major streams and tributaries, including Mitchell Creek and East Fork Hood River, have been completed and based on these results it is unlikely either aquatic snail species basalt Juga or the Columbia duskysails resides in the permit area. Surveys are triggered by proposed ground-disturbing activities that may alter water quality or physical habitat that supports Survey and Manage aquatic mollusks.

Prior to Master Plan implementation, additional surveys will be conducted to verify populations of candidate caddisfly species in streams within the permit area.

Surveys have been completed throughout much of the permit area. Habitat in most of these streams and springs does not appear suitable for these caddisflies based on habitat conditions at locations

where one or more of these species have been found. **However, these four caddisfly species have been removed from the USFS R-6 sensitive species list effective November 2000.**

SCENERY RESOURCES

- 2) Vegetation clearing for lifts, ski trails, service roads, utility corridors and other facilities will be designed to maximize the screening potential of existing vegetation.....
- 3) Repetitive clearing patterns that would result in straight lines, edges, or geometric shapes of vegetative patterns and openings will be avoided.....
- 4) Edge treatments for all clearings will be designed in consultation with the Forest Landscape Architect.....
- 5) "Leave islands" of existing vegetation will be retained, where possible, to avoid extensive clearing and resulting visual contrast.....
- 6) Where ground surface or landform alteration is unavoidable, contour grading will be used to blend and conceal.....
- 7) The creation of extensive cut/fill slopes that expose soil colors that contrast with natural conditions will be avoided.....
- 8) Non-reflective materials will be used for exterior surfaces that blend with the environment.....
- 9) Facilities will be constructed of materials which blend with the earth-tone colors of the environment.....
- 12) Natural topographic features and vegetation buffers will be used to conceal and blend proposed facilities with the forest setting.....
- 13) Facilities on ridgelines will be designed so that contrasting profiles on skylines are minimized.....
- 15) All utilities will be installed underground, except where technically infeasible.....
- 20) Ground disturbance will be minimized in future projects visible from the Timberline Trail, especially the foreground zone (within 1/2 mile).....
- 21) As new projects are added within the Timberline Trail viewshed, visual impacts will be reduced to the extent feasible.....

See scenery report...the proposed lift would meet the various visual quality objects from outside and within the ski area.

CULTURAL RESOURCES

The Timberline Trail will be protected as a cultural and recreational resource and maintained in its natural conditions to the greatest extent possible. *The trail will not be adversely affected by this project.*

Additional consultation will be undertaken with the State Historic Preservation Office and/or the Advisory Council on Historic Preservation for any action that may affect the Timberline Trail. *Consultation with the Oregon State Historic Preservation Office is on-going.*

Cultural resource surveys will be conducted pursuant to Forest Service and State Historic Preservation Office standards prior to construction of any authorized facilities. *Pedestrian inventory coverage included a corridor (100' minimum) on either side of the proposed lift line and temporary road. Since the lift line crosses the Timberline Trail, its potential to affect the trail's eligibility to the National Register was assessed.*

Additional Consultation is taking place with the Confederated Tribes of Warm Springs.

RECREATION

Detailed study of avalanche hazards will be undertaken to determine the safety of new lift, ski trail, service road, and facility locations. *There is no avalanche terrain associated with the Lift 21 project.*

A phased development plan will be submitted for Forest Service approval prior to implementation of any authorized Master plan component. This Plan will detail specifically how and when development of authorized facilities will occur. *Plan was submitted March 2000.*