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Date: January 13, 2012

Greetings:

We are pleased to announce the availability of the Draft Environmental Impact Statement (EIS) prepared for Taos Ski Valley's 2010 Master Development Plan – Phase 1 Projects on the Carson National Forest, Questa Ranger District for your review and comment. We have incorporated the issues and concerns received by those who commented during the scoping process, beginning in December 2010. We hope you will take the time to review this document and submit your comments.[1] The purpose of this Draft EIS comment period is to give the public an opportunity to provide early and meaningful participation on the action alternatives prior to a decision, which will be made by the Responsible Official, Kendall Clark. At this time, the preferred alternative is – Alternative 2.

How to Comment and Timeframe

The Environmental Protection Agency has published a Notice of Availability (NOA) for the Draft EIS in the *Federal Register* on January 13, 2012. The publication date of the NOA in the *Federal Register* is the exclusive means for calculating the comment period for a proposed action documented in a Draft EIS. Comments on the proposed action shall be accepted for 45 days following the date of publication in the *Federal Register* pursuant to 40 CFR §§ 1500-1508.

The NOA provides the sole means of calculating the close of the Draft EIS comment period, and it is up to the individual to ensure that his/her comments are received by the Forest Service in a timely manner. Those wishing to comment should not rely upon dates or timeframe information provided by any other source. Written, facsimile, hand-delivered, oral, and electronic comments concerning this action will be accepted. The office business hours for those submitting hand-delivered comments are 8:00 am to 4:30 pm, Monday through Friday, excluding holidays.

It is recommended to those who wish to submit comments on this Draft EIS to verify the close of the 45-day comment period by visiting the Office of the Federal Register's website at: http://www.federalregister.gov/ or the Carson National Forest's website at: http://www.fs.fed.us/r3/carson/.

[1] Comments received in response to this solicitation, including names and addresses of those who comment, will be considered part of the public record on this proposed action and will be available for public inspection. Comments submitted anonymously will be accepted and considered; however, those who submit anonymous comments will not have standing to appeal the subsequent decision under 36 CFR Parts 215 or 217. Additionally, pursuant to 7 CFR 1.27(d), any person may request the agency to withhold a submission from the public record by showing how the Freedom of Information Act (FOIA) permits such confidentiality. Persons requesting such confidentiality should be aware that, under the FOIA, confidentiality may be granted in only very limited circumstances, such as to protect trade secrets. The Forest Service will inform the requester of the agency's decision regarding the request for confidentiality, and where the request is denied; the agency will return the submission and notify the requester that the comments may be resubmitted with or without name and address within seven days.

Written comments must be submitted to:

Kendall Clark, Forest Supervisor
ATTN: Taos Ski Valley Draft EIS
Carson National Forest
208 Cruz Alta Road
Taos, NM 87571 FAX: 505-758-6213

Oral comments must be provided at the Responsible Official's office during normal business hours via telephone (505-758-6200) or in person, or at an official agency function (i.e., public meeting) that is designed to elicit public comments.

Electronic comments must be submitted in a format such as an email message, plain text (.txt), rich text format (.rtf), Word (.doc or .docx), or Adobe Acrobat (.pdf) to:

comments-southwestern-carson@fs.fed.us

Comments must have an identifiable name attached or verification of identity will be required. A scanned signature may serve as verification on electronic comments.

Reviewers have an obligation to structure their participation in the NEPA process so that it is meaningful and alerts the Agency to the reviewers' position and contentions. Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement.[2] Comments on the Draft EIS should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR § 1503.3).

Appeal Eligibility

For appeal eligibility each individual or representative from each organization submitting substantive comments must either sign the comments or verify identity upon request. Those using electronic means may submit a scanned signature. Otherwise a means of verifying the identity of the individual or organizational representative may be necessary for electronically submitted comments or comments received by telephone. Individual members of an organization must submit their own substantive comments to meet the requirements of appeal eligibility. Comments received on behalf of an organization are considered as those of the organization only.

We are looking forward to hearing from you, especially if you see that some concern of yours has not been addressed as part of the process. We are particularly interested in new information that you think we may have overlooked. While opinions are also welcome, tangible, verifiable information is the most helpful way for me to make a good, informed decision. A Final Environmental Impact Statement and Record of Decision will be made after reviewing all the comments.

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[2] This policy was established as a result of case law, specifically *Vermont Yankee Nuclear Power Corp.* v. *NRDC, 435 U.S. 519, 553* (1978), *City of Angoon* v. *Hodel* (9th Circuit, l986), and *Wisconsin Heritages, Inc.* v. *Harris,* 490 F. Supp. 1334, 1338 (E.D. Wis. 1980).

Additional information regarding the Draft EIS can be obtained from: Audrey Kuykendall at 505-758-6200 or at the above address. This document and other information can also be accessed through www.fs.fed.us/r3/carson.

Sincerely,

KENDALL CLARK
Forest Supervisor

United States
Department of
Agriculture

Forest
Service

**Southwestern
Region**

January 2012

Draft Environmental Impact Statement for Taos Ski Valley's 2010 Master Development Plan—Phase 1 Projects

Carson National Forest
Taos County, New Mexico

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Environmental Impact Statement for the Taos Ski Valley's 2010 Master Development Plan—Phase 1 Proposed Projects

Carson National Forest
Taos, New Mexico

Lead Agency: USDA Forest Service

Responsible Official: Kendall Clark, Forest Supervisor
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208 Cruz Alta Road
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Abstract: This Draft Environmental Impact Statement (EIS) has been prepared to analyze and disclose the estimated environmental effects of implementation of the Taos Ski Valley's 2010 Master Development Plan—Phase 1 Projects. The proposed action includes: two new lifts accessing popular high alpine terrain, three lift upgrades to reduce lift ride times and lift line wait times, two new gladed areas for advanced intermediate to expert skiers, as well as alternative winter and summer recreation opportunities including a lift served mountain bike trail, a new tubing facility, and two snowshoe trails. Finally, re-configuration of the parking lots is proposed in order to improve the sense of arrival at Taos Ski Valley and access to the ski area and Twining Road. In addition to the proposed action and the required no action alternative, a third alternative was analyzed in response to issues raised by Forest Service specialists and public scoping comments.

The draft EIS includes a discussion of the purpose and need for the proposed projects, in-depth descriptions of the proposed projects, and analysis of direct, indirect, and cumulative impacts of the proposed projects on the following resources: recreation, social and economic environment, environmental justice, parking and ski area access, cultural, visual, air quality, water, wetlands, soils, vegetation and wildlife, and specially designated areas.

At this time the preferred alternative has been identified as alternative 2.

It is important that reviewers provide their comments at such times and in such a way that they are useful to the Agency's preparation of the EIS. Therefore, comments should be provided prior to the close of the comment period and should clearly articulate the reviewer's concerns and contentions. The submission of timely and specific comments can affect a reviewer's ability to participate in subsequent administrative review or judicial review.

Comments received in response to this solicitation, including names and addresses of those who comment, will become part of the public record for this proposed action. Comments submitted anonymously will be accepted and considered; however, anonymous comments will not provide the respondent with standing to participate in subsequent administrative review or judicial review.

Send Comments to:	Carson National Forest DEIS for Taos Ski Valley's 2010 MDP—Phase 1 Projects 208 Cruz Alta Road Taos, NM 87571 Fax: (575) 586-0521
Email Comments to:	comments-southwestern-carson@fs.fed.us Please include "Taos Ski Valley Draft EIS" in the subject line.

Summary

Introduction

The proposed projects analyzed in this environmental impact statement (EIS) constitute a federal action (i.e., a decision), with potential to affect the quality of the human environment on National Forest System (NFS) lands. Therefore, these projects must be analyzed pursuant to the National Environmental Policy Act (NEPA) which directs federal agencies to carefully consider environmental concerns in the decision making process and provide relevant information to the public for review and comment.

The Forest Service has prepared this Draft Environmental Impact Statement (DEIS) in compliance with NEPA and other relevant Federal and State laws and regulations. This DEIS discloses potential direct, indirect, and cumulative environmental effects on the human and biological environment estimated to result with implementation of the proposed action.

Background

Taos Ski Valley (TSV) opened with one lift on private land in the Sangre de Cristo Mountains in 1955. By 1957, TSV had expanded operations onto NFS lands in the Carson National Forest (NF). Currently, TSV operates under a Forest Service-issued special use permit (SUP) authorizing the use of NFS lands for the purposes of constructing, operating, and maintaining a winter sports resort, including food services, rentals, retail sales, and other ancillary facilities. The SUP covers 1,268 acres on the Questa Ranger District. An additional 200 acres of private land encompass the remainder of the resort and related operations.[a]

In accordance with the standards and guidelines of the 1986 Carson Forest Plan, as well as the terms of the SUP, a master development plan (MDP) was developed by the ski area to identify goals and opportunities for future management of the ski area on NFS lands. Taos Ski Valley's first MDP was approved by the Forest Service in 1981.[b] Subsequently a new MDP was prepared and submitted by TSV and accepted by the Forest Service in April 2010, providing a roadmap for future improvements at TSV.[c] The 2010 MDP replaced TSV's 1981 MDP and was designed to improve operational efficiencies, as well as the recreational experience at TSV in today's winter sports market. These improvements are intended to help move TSV back into a more competitive role in the destination skier market, to retain existing guests, and to attract new visitors (also see Purpose and Need for Action section, below). The 2010 MDP identified goals for the following areas needing improvement:

1. Underutilized in-bounds terrain
2. Alternative winter and summer activities
3. Antiquated lift network
4. Deficient out-of-base lift capacity/dispersal to back side terrain
5. Inadequate on-mountain guest service facilities

To begin the process of implementing its 2010 MDP, TSV submitted a project proposal letter to the Carson NF in July 2010. It included projects that addressed some of the goals of the 2010

[a] The 40-year SUP was renewed in 2004 and expires in 2044.

[b] TSV, 1981

[c] TSV, 2010

MDP that the ski area thought could be implemented in the next 5 to 7 years. These projects included: two high alpine lifts and two new gladed areas; a new snowtubing area, snowshoe trails, and a mountain bike trail; three lift replacements, and reconfiguration of the parking and guest drop-off areas. The proposal was reviewed and the forest supervisor determined it is consistent with the Carson Forest Plan management direction, as well as specific guidelines for MA 16, and site-specific NEPA analysis was warranted.

Summary of the Purpose and Need for the Proposed Action

The purpose for the proposed action is to improve the quality of the recreation experience and increase recreational opportunities within TSV's permit area, so TSV can reclaim its competitive standing in the Rocky Mountain region. Through offering a higher quality recreational experience within its permit area, TSV would be positioned to increase annual skier/rider visitation, thereby remaining a viable provider of developed recreational opportunities on the Carson NF and in the Rocky Mountain market.[d] Six specific needs have been identified:

- Need #1 – Improve Lift Service to High Alpine, Advanced Intermediate and Expert Terrain within the Special Use Permit Area
- Need #2 – Improve Access to Treed Portions of the Existing Special Use Permit Area
- Need #3 – Provide Alternative Winter and Summer Opportunities within the Special Use Permit Area
- Need #4 – Improve Taos Ski Valley's Antiquated Lift Network
- Need #5 – Improve Resort Access at Taos Ski Valley
- Need #6 – Improve Vehicular Circulation throughout the Day Parking Lots

Summary of the Alternatives Analyzed in the DEIS

Alternative 1 – No Action

The National Environmental Policy Act (NEPA) regulations require a no action alternative be included for analysis alongside the action alternatives.[e] By definition, a no action alternative represents a continuation of existing management practices without changes, additions, or upgrades to the existing ski area infrastructure and trail system. As such, no new projects that would improve the recreational experience of TSV guests would be implemented as a result of the no action alternative.

Under Alternative 1, the existing lift and terrain network would be maintained and no additional recreational opportunities would be offered. In addition, resort access would remain inefficient and would not contribute to a sense of arrival for guests accessing the mountain. Under alternative 1, it would become increasingly difficult for TSV to remain a viable provider of the recreational opportunities for which it is known. In turn, the significant economic, recreational and other benefits that have been realized by the local and regional communities for over 50 years would be expected to erode.

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[d] Refer to the Recreation and Social and Economic Environment sections in chapter 3 for an in depth discussion of visitation and competitive market.

[e] 40 CFR 1502.14(d)

Alternative 2 – Proposed Action

Alternative 2 is the proposed action modified after public scoping, to address identified resource and ski area issues related to two proposed projects: the proposed Snowtubing Center and the proposed Mountain Bike Trail. All of the other proposed project components, including new and realigned lifts, lift replacements, glading, and parking lot reconfigurations are as originally described in the scoping document provided to the public for comment. The alternative presented here is the modified proposed action.

Implementation of alternative 2 would take place over the course of 5 to 10 years. It is important to note that all proposed projects and activities are located within TSV's existing 1,268-acre SUP area, administered by the Carson National Forest (NF) and/or on private lands currently owned by TSV. A bulleted description of Alternative 2 follows. For a detailed description of Alternative 2 the reader is referred to chapter 2.

New Lifts

- Main Street Lift
- Ridge Lift

Glades

- Wild West Glades
- Minnesotas Glades

Lift Replacements

- Lift 4 (Kachina Lift)
- Lift 5 (High Five Lift)
- Lift 7 (Maxie's Lift)

Snowtubing Center

Develop a dedicated snowtubing facility near Lift 3—partially on private lands (0.8 acre) and partially on NFS lands (0.7 acre), within TSV's existing SUP area. The Snowtubing Center would include four distinct lanes, varying from 250 to 280 feet long, separated by snow berms. A roughly 250-foot long carpet conveyor lift would bring tubers from the run-out back to the top.

Adventure Center (Snowshoeing)

The proposed Adventure Center would provide a designated and marked interpretive trail system (one main loop trail with interconnecting segments) for snowshoeing, to further supplement winter activities offered at TSV. The entire trail system would be approximately 2 miles long.

Mountain Bike Trail

A lift-served Mountain Bike Trail (approximately 3.6 miles long) is proposed between the top of Lift 1 and the base area. The proposal for the Mountain Bike Trail in alternative 2 would:

Resort Access

Alternative 2 includes projects that are designed to address issues related to vehicular and pedestrian circulation between day parking lots and Lift 1/Lift 5. Map 4 in appendix A depicts how TSV's eastern day parking lots (Armadillo, Bear, Bison, and Coyote) are proposed to be reconfigured to better accommodate traffic circulation and pedestrian access to the base area.

- Create a new guest drop-off area on Thunderbird Road (East Guest Drop-Off Area).
- Reconfigure the eastern portion of TSV's day parking lots (i.e., Armadillo, Bison, and Bear) to allow Bison to become a thoroughfare primarily for residents of Taos Ski Valley driving to Twining Road, and access to the East Guest Drop-Off Area.
- Construct an extra parking area north of Armadillo to alleviate the loss of parking on Bison.
- Re-grade 9.9 acres of the existing parking lot to improve vehicular access to the new East Guest Drop-Off Area and circulation through the parking lots.

Alternative 3

Alternative 3 was developed in response to significant issues raised by the public during scoping. Alternative 3 does not include the Main Street Lift, the Ridge Lift, the East Guest Drop-Off Area, the Snowtubing Center, or the parking lot reconfiguration.

The following table is a summary of the components in Alternatives 1, 2, and 3.

Comparison of alternatives

	Alternative 1	Alternative 2	Alternative 3
Resort Capacity			
Comfortable carrying capacity (people per day)	3,520	4,200	3,730
Proposed capacity increase	0	680	210
Terrain			
Special use permit area (acres)	1,268	1,268	1,268
Lift-served terrain (acres)	**420** (developed [346] + undeveloped [74])	**604** (developed [346] + undeveloped [258])[a]	**460** (developed [346] + undeveloped [114])[b]
Hike-to terrain (acres)	214	102[c]	246[d]

Comparison of alternatives

	Alternative 1	Alternative 2	Alternative 3
Lifts			
Total number of lifts	13	15	13
New lifts	None	Main Street Lift Ridge Lift	None
Lift Replacements	None	Lift 4 Lift 5 Lift 7	Lift 4 Lift 5 Lift 7
Alternative Summer and Winter Recreation			
Snowtubing Center	Two lanes on Strawberry Hill Operating hours: 5 p.m. to 7 p.m.	Three to four lanes on Strawberry Hill Operating hours: TBD (afternoons and evenings)	Two lanes on Strawberry Hill Operating hours: 5 p.m. to 7 p.m.
Snowshoeing Trails	None	~2 miles	~2 miles
Lift-served Mountain Bike Trail	None	3.6 miles from Lift 1 to the base area	3.6 miles from Lift 1 to the base area
Parking			
Parking spaces	1,740	1,631	1,740
East Guest Drop-Off Area	No	Yes	No
Access to Twining Road	Through the parking lots	Dedicated access road	Through the parking lots

Notes:
[a] Under alternative 2, additional lift-served "undeveloped" terrain includes terrain served by the proposed Main Street and Ridge lifts (including Wild West Glades) as well as the Minnesotas Glades.
[b] Under alternative 3, additioanl lift-served "undeveloped" terrain is limited to the proposed Minnesotas Glades.
[c] Under alternative 2, roughly 112 acres of currently hike-to terrain would be become lift-served via the proposed Main Street and Ridge lifts.
[d] Under alternative 3, hike-to terrain increases by roughly 32 acres with the addition of the proposed Wild West Glades.

Public Involvement

The notice of intent (NOI) to prepare an EIS for Taos Ski Valley's 2010 Master Development Plan—Phase 1 Projects was published in the *Federal Register* on November 23, 2010 (75 FR 71414-15) and corrected on September 29, 2011 (76 FR 60451).[f] The original NOI asked for public comment on the proposal. The Carson NF also mailed a scoping notice in December 2010 to approximately 309 community residents, interested individuals, public agencies, tribal contacts, and other organizations. The scoping package provided a brief description of the proposed action, purpose and need, preliminary issues raised, and an illustrative map. It was specifically designed to elicit comments, concerns, and issues pertaining to the proposed action. The documents in the scoping package were posted on the Carson NF's website. An email address was provided for submitting electronic comments.

Summary of Resource Issues Addressed

Based on the results of scoping, the Forest Service identified specific areas of public concern. Each of the following project components includes a list of indicators which were identified as a means of measuring or quantifying the anticipated level of impact of proposed actions. While additional resources were analyzed, these issues and indicators represent the key decision making factors. The following table summarizes environmental consequences, by project component and indicator, associated with alternatives 1, 2, and 3. Detailed accounts of environmental consequences, by resource, are contained in Chapter 3.

[f] A second NOI was published in Septemer 2011 to document a modifiation of the proposed action. The modification related to a different location for the proposed snowtubing center—from NFS lands to an area partially on private lands.

Summary of environmental consequences

Alternative 1	Alternative 2	Alternative 3
Project Component: Main Street and Ridge Lifts		
Indicator: Anticipated changes in existing use patterns on West Basin Ridge, Highline Ridge, and Kachina Peak.		
No changes to existing use patterns on West Basin Ridge, Highline Ridge, and Kachina Peak are expected under Alternative 1.	Under Alternative 2, use of West Basin Ridge and Kachina Peak is expected to increase as a result of becoming lift-served terrain. Hiking in these areas would still be welcome, but chages for those people who currently value the hike-to experience are expected. Providing lift service to Kachina Peak and portions of West Basin Ridge may increase hiking on Highline Ridge by those who want a hike-to only experience. In order to preserve the hike-to experience along Highline Ridge, TSV would prohibit skiers and riders who utilize the Main Street Lift from descending the ridge further to the north than *K1*.	No changes to existing use patterns on West Basin Ridge, Highline Ridge, and Kachina Peak are expected under Alternative 3.
Indicator: Extent (acres) of hike-to terrain within the SUP area.		
214 acres	102 acres	246 acres

Summary of environmental consequences

Alternative 1	Alternative 2	Alternative 3
Indicator: Disclosure of impacts to federally listed threatened, endangered, and proposed species, Forest Service sensitive species, migratory birds, and management indicator species (MIS) and their habitats.		
Alternative 1 would have no direct or indirect impacts on any federally listed species, Forest Service sensitive species, migratory bird, or MIS indicator species or their habitats.	Alternative 2 is not expected to produce negative impacts to any of the analyzed federally listed species, Forest Service sensitive species, migratory bird, or management indicator species or their habitats. Species analyzed are as follows: • Northern Goshawk • Peregrine Falcon • American Marten • Rocky Mountain Bighorn Sheep • Canada Lynx • Yellow-bellied Marmot • Pika • Ermine • Pecos Fleabane • Alpine Larkspur • White-tailed Ptarmigan • Boreal Owl • Snowshoe Hare • Water Shrew • Southern Red-backed Vole • Western Heather Vole • Long-tailed Vole • Hairy Woodpecker • Elk	Alternative 3 is not expected to produce negative impacts to any of the analyzed federally listed species, Forest Service sensitive species, migratory bird, or management indicator species or their habitats. Species analyzed are as follows: • Northern Goshawk • Peregrine Falcon • American Marten • Rocky Mountain Bighorn Sheep • Canada Lynx • Yellow-bellied Marmot • Pika • Ermine • Pecos Fleabane • Alpine Larkspur • White-tailed Ptarmigan • Boreal Owl • Snowshoe Hare • Water Shrew • Southern Red-backed Vole • Western Heather Vole • Long-tailed Vole • Hairy Woodpecker • Elk

Summary of environmental consequences

Alternative 1	Alternative 2	Alternative 3
Indicator: Disclosure of impacts to the Wheeler Peak Wilderness viewshed.		
Alternative 1 would not change or modify the visual quality of the study area. No impacts would occur to the Wheeler Peak Wilderness viewshed.	Under alternative 2, the top of the proposed Main Street Lift would not be visible from Wheeler Peak, but could be seen from the ridge between Wheeler and Walter peaks, in the Wheeler Peak Wilderness. Changes would be subordinate to the general landscape character. The proposed Main Street Lift would be bottom drive, and only a tower supporting a bullwheel and a small lift operator/ski patrol building would sit at the top of the proposed lift. Natural topography, combined with the north-facing aspect of Kachina Peak within TSV's SUP area, would obscure most of (portions of the top terminal infrastructure may be slightly visible) the Main Street Lift from Wheeler Peak Wilderness.	Under alternative 3, no impacts would occur to the Wheeler Peak Wilderness viewshed.
Indicator: Potential for access to Taos Pueblo lands.		
Under alternative 1, access throughout the SUP area would not change, and there would be no potential for increased trespass on tribal lands.	Under alternative 2, access above Lift 5 (mid-way up the front side of the mountain) would not change. Neither the Main Street Lift nor the Ridge Lift would be operated during the summer. Alternative 2 would not increase the potential for summer or winter trespass onto nearby tribal lands.	Under alternative 3, access throughout the SUP area would not change, and there would be no potential for increased trespass on tribal lands.

Summary of environmental consequences

Alternative 1	Alternative 2	Alternative 3
Project Component: Resort Access		
Indicator: Anticipated changes to the guest arrival experience at TSV.		
Under Alternative 1, no changes to the guest arrival experience at TSV are expected.	Alternative 2 would substantially improve vehicular circulation within and between TSV's day parking lots. This alternative would provide better separation of individual lots and more defined vehicular thoroughfares, improving the guest arrival experience. Under Alternative 2, the East Guest Drop-Off Area would become the main entry portal to TSV and is expected to substantially improve the visitor experience by contributing to an active pedestrian environment, further adding to a positive sense of arrival for guests to TSV. Furthermore, the East Guest Drop-Off Area would allow guests views of the mountain, reinforcing a positive sense of arrival with visual cues of lifts and ski trails that have become standard at world-class ski resorts.	Under Alternative 3, arrival conditions would be identical to the existing conditions. No changes to the guest arrival experience at TSV are expected.
Indicator: Changes in pedestrian circulation between the guest drop-off and local businesses at the base area.		
Under Alternative 1, no changes to pedestrian circulation would occur at TSV.	The proposed East Guest Drop-Off Area and pedestrian pathways have the potential to improve foot traffic to merchants that have businesses in and around TSV's base area. A realignment of the existing footbridge leading to the Alpine Village commercial area would minimize impacts to local business and offer guests additional shops en route to the base area. Alternative 2 would give pedestrians the option to continue using Sutton Place Road to access the base area or access through the new East Guest Drop-Off Area.	Under alternative 3, parking and vehicular/pedestrian access at TSV would be identical to alternative 1. No changes to pedestrian circulation would occur at TSV.

Summary of environmental consequences

Alternative 1	Alternative 2	Alternative 3
Project Component: Snowtubing Center and Parking Lot Reconfiguration		
Indicator: Potential impacts (acres) to existing waters of the U.S., including wetlands, from construction and operation of the Snowtubing Center as well as implementation of the parking lot reconfiguration.		
Under Alternative 1, approximately 68 miles of streams would continue to exist within the Rio Hondo watershed. Land use in the watershed would continue to have affects on the water quantity and quality; however, no additional affects to hydrology within the watershed would be anticipated as a result of alternative 1.	The Snowtubing Center proposed under alternative 2 would eliminate 0.14 acre of PSS wetland 1. The location of the Snowtubing Center is currently heavily developed with the popular Strawberry Hill teaching terrain and tubing lanes on the south side of the Rio Hondo, and the parking lots on the north side. Under alternative 2, the Snowtubing Center would be realigned and expanded causing wetland 1 to be eliminated. A U.S. Army Corps of Engineers (USACE) permit would be required prior to wetland impacts. A condition of the permit would be to mitigate loss of this wetland. Wetland mitigation has been identified that would create a PSS wetland upstream from the tubing location, along the Rio Hondo. This mitigation would be implemented concurrently with, or prior to, grading the tubing area.	Under Alternative 3, no impacts are likely to existing waters of the US; however, approximately 0.15 acre of grading would occur within 50 meters of streams and wetlands within the project area as a result of implementing the Lift 4 upgrade and the mountain bike trail.

Summary of environmental consequences

Alternative 1	Alternative 2	Alternative 3
Indicator: Potential impacts to any Clean Water Act (CWA) impaired or threatened waterbody segments from construction and operation of the Snowtubing Center, as well as the parking lot reconfiguration.		
Under alternative 1, no sediment would be added to any CWA impaired or threatened waterbody.	Under alternative 2 approximately 0.8 acre of shrubland would be converted to grassland for the Snowtubing Center and approximately 1.7 acres of forest and 1.3 acres of grassland would be converted to the urban cover type for the parking lots. These three cover type conversions have potential to increase nutrient exports to the Rio Hondo, however with implementation of FS BMP, nutrient levels would remain below the load limits established by the TMDL.	Under alternative 3, no sediment would be added to any CWA impaired or threatened waterbody.
Indicator: Quantification of the change in snowmaking coverage (acres) and water use (acre feet) and impacts from water diversions.		
Under alternative 1, no change in snowmaking coverage and water use would occur.	Under alternative 2, 1.5 additional acres of snowmaking coverage would be created for the snowtubing center. This additional snowmaking would require 2.3 AF of water diversions from the Rio Hondo.	Under alternative 3, no change in snowmaking coverage and water use would occur.

Other Topics Considered

The following topics were analyzed as part of this EIS (refer to Chapter 3), but not included in the indicators listed above.

- Vegetation
- Wildlife and Aquatic
- Vehicular and Pedestrian Circulation
- Winter and Summer Recreation Experiences
- Social and Economic Factors
- Environmental Justice
- Visual Quality
- Soils
- Air Quality and Climate Change
- Eligible Wild and Scenic River/Wilderness

Contents

Chapter 1. Purpose and Need for Action 1
Document Structure 1
Background 1
Purpose and Need for Action 3
Summary of the Proposed Action 6
Modified Proposed Action 6
Decision Framework 7
Public Involvement 7
Tribal Consultation 8
Taos Ski Valley and Taos Pueblo 9
Issues 9
Main Street and Ridge Lifts 9
Resort Access 10
Snowtubing Center and Parking Lot Reconfiguration 10
Other Proposed Projects Not Specifically Addressed in Issues/Indicators 10
Other Topics Considered 11
Vegetation 11
Wildlife and Aquatic 11
Vehicular and Pedestrian Circulation 11
Winter and Summer Recreation Experiences 11
Social and Economic Factors 11
Environmental Justice 11
Visual Quality 12
Soils 12
Air Quality and Climate Change 12
Eligible Wild and Scenic River/Wilderness 12
Other Required Disclosures 12

Chapter 2. Alternatives, Including the Proposed Action 15
Alternatives Considered in Detail 15
Alternative 1 – No Action 15
Alternative 2 – Proposed Action 16
Alternative 3 22
Mitigation Measures Common to Action Alternatives 25
Alternatives and Project Components Considered but Eliminated from Detailed Study 30
An Alternative that Locates the Snowtubing Area near the Snowshoeing Trails 30
An Alternative that Aligns the Snowtubing Lanes to the West 30
An Alternative Mountain Bike Trail Alignment 31
An Alternative that Keeps the Existing Footbridge Alignment to Alpine Village 31
An Alternative that Includes Additional Parking 31
An Alternative Reconfiguration of the Parking Lots 31
An Alternative that Implements All the Projects Identified in the 2010 Master Development Plan 31
Summary of Effects by Alternative 32

Chapter 3. Affected Environment and Environmental Consequences 35
Recreation 37
Affected Environment 37
Environmental Consequences 48
Cumulative Effects 60
Irreversible and Irretrievable Commitment of Resources 62

Social and Economic Environment 63
Affected Environment *63*
Environmental Consequences *73*
Cumulative Effects *77*
Irreversible and Irretrievable Commitment of Resources *79*
Environmental Justice 80
Parking and Ski Area Access 81
Affected Environment *81*
Environmental Consequences *84*
Cumulative Effects *87*
Irreversible and Irretrievable Commitment of Resources *88*
Cultural Resources 89
Federal Direction *89*
Affected Environment *89*
Environmental Consequences *90*
Cumulative Effects *92*
Irreversible and Irretrievable Commitment of Resources *93*
Visual Quality 94
Management of the Scenic Environment on National Forest System Lands *94*
Affected Environment *96*
Environmental Consequences *103*
Cumulative Effects *105*
Irreversible and Irretrievable Commitments of Resources *106*
Air Quality 107
Regulatory Direction *107*
Affected Environment *110*
Environmental Consequences *113*
Cumulative Effects *116*
Irreversible and Irretrievable Commitment of Resources *117*
Water, Wetlands and Soils Resources 118
Forest Plan Direction *118*
Management Area 16 – Recreation Sites *118*
Clean Water Act *119*
U.S. Army Corps of Engineers Direction *119*
Executive Order 11988 ..... *119*
Executive Order 11990 ..... *119*
Affected Environment *120*
Environmental Consequences *126*
Cumulative Effects *136*
Irreversible and Irretrievable Commitment of Resources *137*
Vegetation and Wildlife Resources 138
Affected Environment *138*
Environmental Consequences *149*
Federally Listed Threatened, Endangered, and Proposed Species 149
Forest Service Regional Sensitive Species 150
Management Indicator Species 175
Migratory Birds 182
Cumulative Effects *185*
Irreversible and Irretrievable Commitment of Resources *186*

Specially Designated Areas 187
Wilderness Areas, Wilderness Study Areas, and Inventoried Roadless Areas *187*
Wild and Scenic River Eligibility *187*

Chapter 4. Consultation and Coordination 189
Preparers 189
Forest Service Team *189*
Consultant Team *189*
Agencies, Organizations, Tribal Governments, and Persons Contacted 190
Federal Government *190*
Tribal Government *191*
State Government *191*
Local Government *191*

Literature Cited 193

Glossary 199

Appendix A. Alternatives Maps 207
Map 1: Alternative 1 – No Action Alternative
Map 2: Alternative 2 – Proposed Action
Map 3: Alternative 3
Map 4: Proposed Base Area Detail Alternatives 1, 2, and 3
Map 5: Existing Streams and Wetlands

Appendix B. Past, Present, and Reasonably Foreseeable Actions Considered in Cumulative Effects Analyses 209
2010 Master Development Plan 214

Index 217

List of Figures

Figure 1. Annual Taos Ski Valley skier/rider visits from 1991 to 2011 39
Figure 2. Annual Taos Ski Valley skier/rider visits from 1991 to 2011 72
Figure 3. View of West Basin Ridge 97
Figure 4. View looking up to Kachina Peak from Japanese Flag 98
Figure 5. Kachina Peak with Wheeler Peak in the background 99
Figure 6. North American Glade 100
Figure 7. Area proposed for Minnesotas Glades 101
Figure 8. Proposed location for East Guest Drop-Off Area 102
Figure 9. Existing arrival experience at west drop-off area 102
Figure 10. View to the south of proposed Main Street Lift base terminal 139
Figure 11. View of proposed Main Street Lift alignment from the upper terminal 139
Figure 12. Proposed Ridge Lift terrain 140
Figure 13. A view looking down from the proposed upper Ridge Lift terminal 141
Figure 14. The proposed Wild West Glades area 142
Figure 15. Red squirrel midden found within the proposed Wild West Glades area 143
Figure 16. View of proposed Minnesotas Glades showing high tree mortality 144
Figure 17. View from the top of the proposed Minnesota Glades 145
Figure 18. An existing game trail along the route for the proposed Mountain Bike Trail 146
Figure 19. View of the existing Chair 4 about midway down the slope 148

List of Tables

Table 1. Summary of the project components proposed by alternative 25
Table 2. Mitigation measures applied to action alternatives 2 and 3, by resource 26
Table 3. Summary of effects by alternative 32
Table 4. Annual Taos Ski Valley skier/rider visits from 1991 to 2011 38
Table 5. Annual U.S. skier/rider visits from 1991 to 2011 43
Table 6. Comparison of alternatives relative to recreation indicators 59
Table 7. Taos Ski Valley visitation characteristics 68
Table 8. Taos Ski Valley skier visits, gross receipts taxes, and lodgers tax 70
Table 9. Annual Taos Ski Valley skier/rider visits from 1991 to 2011 71
Table 10. Taos Ski Valley's existing parking capacities 82
Table 11. Summary of Taos Ski Valley's parking capacity by alternative 86
Table 12. National ambient air quality standards for criteria pollutants 107
Table 13. CO_2e generated by alternative post implementation 113
Table 14. Existing streams within the Rio Hondo watershed 120
Table 15. Existing wetlands identified within the special use permit area 124
Table 16. Existing soils within the Taos Ski Valley special use permit area 125
Table 17. Conversion of cover types 127
Table 18. Soils with severe erosion hazard within the alternative 2 project areas 133
Table 19. Soils with severe erosion hazard within the alternative 3 project area 135
Table 20. Federally listed threatened, endangered, or proposed species considered in the wildlife effects analysis 149
Table 21. Forest Service sensitive species that may occur on the Questa Ranger District 151
Table 22. Proposed projects that could potentially affect Forest Service sensitive species 157
Table 23. Management indicator species and habitats 176
Table 24. Proposed projects that could potentially affect management indicator species 176
Table 25. Alpine tundra high priority species 183

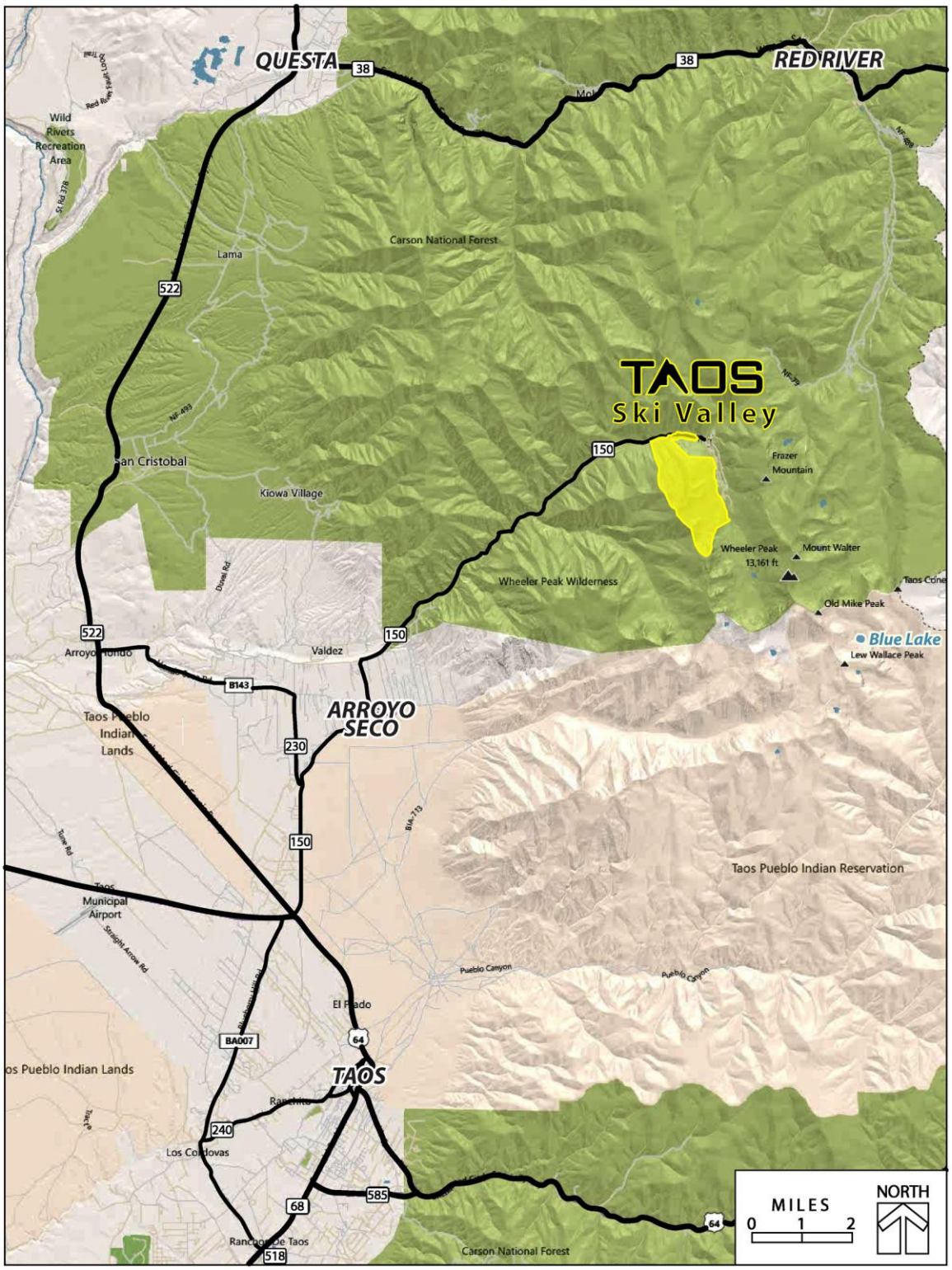
Table 26. Spruce-fir high priority species..... 184
Table 27. High elevation riparian woodland high priority species..... 185
Table 28. Reasonably foreseeable actions considered..... 210

Acronyms

ABQ	Albuquerque International Sunport
AF	Acre feet
AQB	Air Quality Bureau
ARPA	Archaeological Resources Protection Act
AVO	Average Vehicle Occupancy
BA	Biological Assessment
BE	Biological Evaluation
BEIG	Built Environment Image Guide
BMP	Best Management Practice
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
CCC	Comfortable Carrying Capacity
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CH4	Methane
CO2	Carbon Dioxide
CWA	Clean Water Act
dbh	Diameter at Breast Height
DPS	Distant Population Segment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FR	Federal Register
FSH	Forest Service Handbook
FSM	Forest Service Manual
GHG	Greenhouse Gases
GIS	Geographic Information System
GRT	Gross Receipts Taxes
ID Team	Interdisciplinary Team
MA	Management Area
MDP	Master Development Plan
MIS	Management Indicator Species
MSATs	Mobile source air toxics
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves and Repatriation Act
NEPA	National Environmental Policy Act
NF	National Forest

NFS	National Forest System
NHPA	National Historic Preservation Act
NM-150	New Mexico State Highway 150
NMAAQS	New Mexico Ambient Air Quality Standards
NMAC	New Mexico Administrative Code
NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
NMPIF	New Mexico Partners in Flight
NO2	Nitrogen Dioxide
NOI	Notice of Intent
NOx	Nitrogen Oxide
NRHP	National Register of Historic Places
NSAA	National Ski Area Association
O3	Trioxygen (Ozone)
Pb	Lead
PDC	Project Design Criteria
PEM	Palustrine Emergent
PM10	Particulate Matter under 10 microns
PM2.5	Particulate Matter under 2.5 microns
pph	People Per Hour
PPM	Parts Per Million
PSD	Prevention of Significant Deterioration
PSS	Palustrine Shrub/Scrub
R3	Region 3, Southwestern Region of the Forest Service
RD	Ranger District
ROD	Record of Decision (associated with an EIS)
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SMS	Scenery Management System
SO2	Sulfur Dioxide
SUP	Special Use Permit
SWPPP	Stormwater Pollution Prevention Plan
SWWF	Southwestern willow flycatcher
TBD	To Be Determined
TM Plan	Carson NF Questa Ranger District Travel Management Plan
TMDL	Total Maximum Daily Load
TSP	Total Suspended Particulate
TSV	Taos Ski Valley
µg	Micrograms
UNESCO	United Nations Educational, Scientific and Cultural Organization

USACE	United States Army Corps of Engineers
USC	United States Code
USCA	United States Code Annotated
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	US Geological Survey
VMS	Visual Management System
VQO	Visual Quality Objective
VSS	Vegetation Structural Stage
WSA	Wilderness Study Area



Location Map

Chapter 1. Purpose and Need for Action

Document Structure

The Forest Service has prepared an environmental impact statement (EIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This EIS discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. This draft EIS is a disclosure document, not a decision document. Its purpose is to provide sufficient environmental analysis to support a record of decision (ROD), which will be released in conjunction with a final EIS.

The document is organized into four chapters with additional sections included for reference:

- Chapter 1. Purpose and Need for Action: The chapter includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- Chapter 2. Alternatives, including the Proposed Action: This chapter provides a more detailed description of the agency's proposed action, as well as alternative methods for achieving the stated purpose. These alternatives were developed based on issues raised by the public and other agencies. This discussion also includes mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- Chapter 3. Affected Environment and Environmental Consequences: This chapter describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource: Recreation; Social and Economic Environment; Environmental Justice; Parking and Ski Area Access; Cultural Resources; Visual Quality; Air Quality; Water, Wetlands and Soils Resources; Vegetation and Wildlife Resources; and Specially Designated Areas.
- Chapter 4. Consultation and Coordination: This chapter provides a list of preparers and agencies consulted during the development of the environmental impact statement.
- Literature Cited: A list of all the references cited in the document.
- Glossary: Definitions of the terms commonly used in the document.
- Appendices: The appendices provide more detailed information to support the analyses presented in the environmental impact statement such as details about projects analyzed for cumulative effects and the record index.
- Index: The index provides page numbers by document topic.

Additional documentation, including more detailed analyses of project area resources, may be found in the project planning record.

Background

Taos Ski Valley (TSV) opened with one lift on private land in the Sangre de Cristo Mountains in 1955. By 1957, TSV had expanded operations onto National Forest System (NFS) lands in the Carson National Forest (NF). Currently, TSV operates under a Forest Service-issued special use permit (SUP) authorizing the use of NFS lands for the purposes of constructing, operating, and maintaining a winter sports resort, including food services, rentals, retail sales, and other ancillary

facilities. The SUP covers 1,268 acres on the Questa Ranger District. An additional 200 acres of private land encompass the remainder of the resort and related operations.[1]

The ski area is approximately 20 miles outside of the Town of Taos (location map). There are several small airports available for private use near TSV, including the Taos Airport, Angel Fire, and Santa Fe. The closest commercial airport is the Albuquerque International Sunport, approximately 150 miles away. Taos Ski Valley is accessed via NM-150/Ski Valley Rd, 15 miles from the intersection with US-64. Taos Ski Valley's market is primarily composed of regional/national destination visitors and day skiers from the Taos, Santa Fe, and Albuquerque areas.

In 1986, the Carson National Forest implemented its land and resource management plan (hereby, Carson Forest Plan), in compliance with the National Forest Management Act (NFMA). Taos Ski Valley's SUP area is allocated in the Carson Forest Plan as Management Area (MA) 16 – Recreation Sites.[2] Areas that are allocated for recreation sites are "areas of concentrated recreation use." Three alpine ski areas on the Carson NF are located within MA 16. They are Sipapu Ski Area, Red River Ski Area, and Taos Ski Valley. The 1986 Carson Forest Plan provides the following standards and guidelines for MA 16 with respect to ski areas:

- Administer the existing ski areas in accordance with the direction in the Master Development Plan for each area.
- Plan and monitor watershed treatments and conditions.
- Conduct administrative studies relating to watershed management.

In accordance with the standards and guidelines of the Carson Forest Plan, as well as the terms of the SUP, a master development plan (MDP) was developed by the ski area to identify goals and opportunities for future management of the ski area on NFS lands. Taos Ski Valley's first MDP was approved by the Forest Service in 1981.[3] Subsequently a new MDP was prepared and submitted by TSV and accepted by the Forest Service in April 2010, providing a roadmap for future improvements at TSV.[4] The 2010 MDP replaced TSV's 1981 MDP and was designed to improve operational efficiencies, as well as the recreational experience at TSV in today's winter sports market. These improvements are intended to help move TSV back into a more competitive role in the destination skier market, to retain existing guests, and to attract new visitors (also see Purpose and Need for Action section, below). The 2010 MDP identified goals for the following areas needing improvement:

1. Underutilized in-bounds terrain
2. Alternative winter and summer activities
3. Antiquated lift network
4. Deficient out-of-base lift capacity/dispersal to back side terrain
5. Inadequate on-mountain guest service facilities

[1] The 40-year SUP was renewed in 2004 and expires in 2044.

[2] USDA Forest Service, 1986d

[3] TSV, 1981

[4] TSV, 2010

To begin the process of implementing its 2010 MDP, TSV submitted a project proposal letter to the Carson NF in July 2010. It included projects that addressed some of the goals of the 2010 MDP that the ski area thought could be implemented in the next 5 to 7 years. These projects included: two high alpine lifts and two new gladed areas; a new snowtubing area, snowshoe trails, and a mountain bike trail; three lift replacements, and reconfiguration of the parking and guest drop-off areas. The proposal was reviewed and the forest supervisor determined it is consistent with the Carson Forest Plan management direction, as well as specific guidelines for MA 16, and site-specific NEPA analysis was warranted.

Purpose and Need for Action

Over the last two decades, TSV's annual visitation has been in a steady decline. Between 1990 and 2011, TSV's highest annual visitation was 364,000 in 1994/95. Taos Ski Valley has not exceeded 300,000 annual visits since the 1997/98 season (300,264). In the 1990s, TSV averaged almost 295,000 annual visits. Between 2000 and 2011, TSV averaged approximately 224,000 annual visits, equating to a 25 percent drop in visitation between the 2 decades.

Since its inception in the 1950s, TSV has been a preeminent player in a relatively small and unique group of North American resorts that are renowned for abundant quality snow, steep, adventurous terrain, and uncrowded slopes. Relatively recently, the ski industry has increased the numbers of lifts serving expert/advanced intermediate, undeveloped terrain. Through a variety of projects, other Rocky Mountain resorts have managed to retain, improve, and/or create their reputations within this "adventure" skiing and snowboarding market segment. While TSV has maintained its reputation for offering unparalleled expert skiing and riding, its annual visitation has continued to decline. Based on what has happened with other Rocky Mountain resorts, this decline can partially be attributed to TSV not responding with new lift installations to access some of its undeveloped terrain, more advanced intermediate terrain, and additional winter and summer recreational opportunities, which have become vitally important to meet visitor demands and keep pace with competing markets.

Guest expectations continue to evolve in today's competitive skier/rider market and resorts must constantly focus on raising service standards and improving the overall recreational experience. While TSV's board of directors made the decision to allow snowboarding in 2008, the ski area has not made any substantive infrastructural or qualitative improvements over the past two decades, and in the process has failed to evolve commensurate with the demands and expectations of its market. As a result, TSV is experiencing substantially lower annual visitation than it did in the mid-1990s.

The purpose for the proposed action is to improve the quality of the recreation experience and increase recreational opportunities within TSV's permit area, so TSV can reclaim its competitive standing in the Rocky Mountain region. Through offering a higher quality recreational experience within its permit area, TSV would be positioned to increase annual skier/rider visitation, thereby remaining a viable provider of developed recreational opportunities on the Carson NF and in the Rocky Mountain market.[5]

[5] Refer to the Recreation and Social and Economic Environment sections in chapter 3 for an in depth discussion of visitation and competitive market.

Projects included in the proposed action have been specifically designed in response to six categories of identified opportunities and constraints at TSV to meet the purpose and need. These categories, defined below, were introduced in TSV's accepted 2010 MDP.

Purpose and Need #1

Improve Lift Service to High Alpine, Advanced Intermediate and Expert Terrain within the Special Use Permit Area

Taos Ski Valley's unique offering of inbounds, expert-only terrain helps define its reputation throughout the ski industry. However, much of this terrain is only accessible by hiking from the top of lifts 2 and 6, along West Basin Ridge and Highline Ridge. Even for those who are physically able and familiar with TSV, most remote hike-to terrain requires a 45- to 60-minute hike to reach. The abundance of hike-to terrain at TSV, combined with the difficulty in accessing it, results in a lost opportunity for both the ski area (i.e., operationally) and its clientele (i.e., vertical feet and number of runs that can be obtained).

There is a need for lift service to access high alpine terrain at TSV, to respond to growing demand (as witnessed throughout the ski industry), while still maintaining a healthy balance of hike-to terrain for which TSV is so well known.

Purpose and Need #2

Improve Access to Treed Portions of the Existing Special Use Permit Area

Throughout the existing SUP area there are examples of undeveloped terrain, including glades, chutes, and steeps, that are either accessible from within TSV's developed lift and trail network or by hiking. Some of these areas are underutilized because they are heavily treed and either too tight or difficult for a large segment of TSV's clientele to use.

There is a need for improving access to and use of heavily treed portions of the existing SUP area to more effectively make use of skiable terrain that is currently underutilized.

Purpose and Need #3

Provide Alternative Winter and Summer Opportunities within the Special Use Permit Area

Snowtubing is an extremely popular alternative winter activity at resorts across the country. Currently, TSV's guests can rent snowtubes on the lower section of *Strawberry Hill*, walk up the hill (often waiting long periods for their turn), and then descend a more or less wide open slope.

Quality, alternative winter activities are needed at TSV that compliment traditional skiing and riding. A well-designed, dedicated snowtubing facility, with a lift, is an amenity that has a demand at TSV, as demonstrated seasonally by the number of guests that use *Strawberry Hill* for snowtubing. Likewise, snowshoeing is not currently offered at TSV, but represents an opportunity for a low impact, added amenity for guests who seek other forms of winter recreation in a forested setting.

Due to its elevation, climate, and existing infrastructure, TSV has the potential to provide a variety of summer recreational activities. Currently, summer activities at TSV are limited to special events and chairlift rides on Lift 1 (guests can either download back to the base area or walk back down on the TSV maintenance road). By capitalizing on its existing summer chairlift rides, TSV could offer lift-served mountain biking by providing a mountain bike trail system

within its SUP area. Lift-served mountain biking is an opportunity TSV could easily and effectively offer to existing and potential summer clientele (both visitors and locals).

There is a need for quality alternatives to the existing winter and summer opportunities offered at TSV.

Purpose and Need #4

Improve Taos Ski Valley's Antiquated Lift Network

Taos Ski Valley's entire lift network is composed of fixed-grip chairlifts, with the exception of three surface conveyors on teaching terrain in the base area. The on-mountain lift network dates back to 1973 (Lift 5). Strategic lift replacements would increase out-of-base capacity, improve operational efficiencies of the lift network, and increase utilization of some of TSV's most popular terrain, namely the Lift 4 and Lift 7 pods.

Lift 4 is the sole lift servicing the eastern portion of the SUP area. Given its relatively low hourly capacity (1,800 people-per-hour [pph]) for its role, as well as its length (4,542 feet long requiring an 8.5-minute ride), the replacement of the Lift 4 with a high-speed detachable quad would more efficiently serve the terrain within this pod.

Lift 5 is a fixed-grip double chairlift (with a capacity of 1,200 pph) installed in 1973. In 1989, Lift 1, which is in a parallel alignment to Lift 5, was replaced to increase the out-of-base capacity. Generally Lift 1, with a capacity of 2,100 pph, provides most of TSV's out-of-base capacity and Lift 5 is only operated on a limited schedule (busy periods, such as peak days, holidays, and Sundays/Mondays for ski school). While the 2010 MDP discusses a conceptual lift that would provide direct access to the summit from the base area, TSV does not plan on pursuing that project in the foreseeable future due to its high cost. Upgrading Lift 5 with a high-speed detachable quad would provide sufficient out-of-base capacity to allow one lift to operate at all times.

Lift 7 is the only lift servicing the center portion of the resort. Due to its age and low capacity (1,800 pph) the replacement of Lift 7 (a fixed-grip triple) with a fixed-grip quad would increase utilization of beginner, intermediate, and advanced terrain, the Out-To-Launch Terrain Park, and expert glades and chutes located in the center of the resort.

There is a need for improving the efficiency and utilization of TSV's existing lift system, to provide more opportunity for guests to ski and ride the trails for which the ski area is so well-known.

Purpose and Need #5

Improve Resort Access at Taos Ski Valley

The majority of TSV guests park in a series of day lots and ride a shuttle to the base area. A small percentage of guests walk to the base area after parking their cars. The shuttle drop-off area/turnaround is located at the Pagoda on Sutton Place Road. In its current configuration, the drop-off area does not contribute to a sense of arrival for guests accessing the mountain, which is an important element in defining the guest experience. All guests arriving at the existing drop-off area must ascend 30 feet in elevation by a series of stairs and slopes. The stairs and slopes are difficult for guests, especially in ski boots, carrying gear, and/or accompanying children.

There is a need for an easier pedestrian access route from the shuttle drop-off to skier services and Lift 1/Lift 5.

Purpose and Need #6

Improve Vehicular Circulation throughout the Day Parking Lots

Traffic circulation through TSV's parking areas is encumbered by the nature of the long, narrow lots, particularly in the eastern lots closest to the base area. This is mostly problematic for residents who must drive through these lots to reach Twining Road (i.e., there is no thoroughfare). Similar to purpose and need #5, parking circulation contributes to the initial recreational experience or sense of arrival at a ski area.

There is a need for better traffic circulation throughout TSV's day lots (for both guests and residents), including providing specific areas for day parking and direct routes to the drop-off area, the base area, local businesses, overnight lodging facilities, and private residences.

Summary of the Proposed Action

As depicted on the maps in appendix A, and defined in detail in chapter 2, the Forest Service proposes to allow TSV (within its existing permit area) to:

- Install Main Street and Ridge lifts to address purpose and need #1;
- Create Minnesotas and Wild West Glades to address purpose and need #2;
- Create a new Snowtubing Center to address purpose and need #3;
- Provide an Adventure Center for snowshoeing to address purpose and need #3;
- Offer a lift-served Mountain Bike Trail to address purpose and need #3;
- Replace lifts 4, 5, and 7 to address purpose and need #4; and
- Reconfigure/relocate the guest and shuttle drop-off areas, footbridge, and the day parking lots to address purpose and need #5 and #6.

These projects would meet the purpose and need for action, as well as the overall goals of TSV's 2010 MDP. Collectively, the projects contained in the proposed action are designed to improve TSV's ability to meet guest demand and expectations, and secure TSV's economic viability by bolstering annual visitation to approach levels previously achieved in the 1990s.

Modified Proposed Action

Through public and internal scoping, it became apparent that the snowtubing component of the original Adventure Center (as identified in the 2010 MDP) presented two issues: 1) it would result in impacts to a relatively undisturbed area and 2) it would be physically too far removed from the base area to meet operational and users' needs. Taos Ski Valley therefore reconsidered options for a snowtubing area and ultimately submitted a revised proposal to the Carson NF for a different location to construct and operate the snowtubing facility.

The majority of the new proposed snowtubing area would be located on private land owned by Taos Ski Valley, Inc. The run out lanes would cross the Rio Hondo over the existing "box car" bridge and end on NFS lands. The area on NFS lands is included in the modified proposed action.

The area where the snowshoe trail system is proposed will still be referred to as the "Adventure Center." The snowtubing facility will be referred to as the "Snowtubing Center."

In addition, while surveying the proposed Mountain Bike Trail alignment, the biologist discovered the trail would traverse a drainage with steep banks and flowing water several times, on the east edge of *North American Glade*. The proposed trail was redesigned to minimize crossing, and a small culvert or log bridge would be placed at the crossings to allow water to flow under the trail.

During scoping, local businesses within the Alpine Village complex expressed concern regarding the location of the proposed East Guest Drop-Off Area at the east end of the parking lots. Taos Ski Valley worked with property owners to redesign the alignment of the footbridge accessing the complex, so there would be a direct connection from the proposed East Guest Drop-Off Area to base area services, while maintaining access to the businesses.[6]

Refer to the description of alternative 2 in chapter 2 and maps in appendix A for more detailed descriptions and locations of these modifications.

Decision Framework

The decision framework is the nature and scope of the proposed action and the decision to be made. Based on the analysis documented in an EIS, the responsible official, the forest supervisor for the Carson NF, will decide whether to select the proposed action as proposed or a modification, or as described in an alternative. In addition to determining which alternative to select, the responsible official will also determine which project design criteria, mitigation measures, and best management practices (BMPs) to require.

Public Involvement

The notice of intent (NOI) to prepare an EIS for Taos Ski Valley's 2010 Master Development Plan—Phase 1 Projects was published in the *Federal Register* on November 23, 2010 (75 FR 71414-15) and corrected on September 29, 2011 (76 FR 60451).[7] The original NOI asked for public comment on the proposal. The Carson NF also mailed a scoping notice in December 2010 to approximately 309 community residents, interested individuals, public agencies, tribal contacts, and other organizations. The scoping package provided a brief description of the proposed action, purpose and need, preliminary issues raised, and an illustrative map. It was specifically designed to elicit comments, concerns, and issues pertaining to the proposed action. The documents in the scoping package were posted on the Carson NF's website. An email address was provided for submitting electronic comments.

[6] A new footbridge would be under a Forest Service SUP with the property owner of Alpine Village; however, TSV will be responsible for evaluating the effects of the new realignment.

[7] A second NOI was published in Septemer 2011 to document a modifiation of the proposed action. The modification related to a different location for the proposed Snowtubing Center—from NFS lands to an area partially on private lands.

Tribal Consultation

The tribal consultation process for the Forest Service is guided through a variety of laws, Executive Orders and Memorandums, as well as case law. Laws include the National Historic Preservation Act and subsequent amendments, Archaeological Resources Protection Act, American Indian Religious Freedom Act, National Environmental Policy Act, and the National Forest Management Act. Memorandums include 1994 Government-to-Government Relations with Native American Tribal Governments. Executive Orders include Accommodations of Sacred Sites (E.O. 13007) and Environmental Justice (E.O. 12898).

Numerous American Indian tribes have ancestral ties to lands within the Carson National Forest. Based on current and past consultation, the following American Indian tribes are known to have cultural ties and/or traditional use areas on the Questa Ranger District:

The Hopi Tribe	Pueblo of Santa Clara
Jicarilla Apache Nation	Southern Ute Tribe
Pueblo of Jemez	Ute Mountain Ute Tribe
The Navajo Nation (Dine′)	Pueblo of Tesuque
Pueblo of Okhay Owingeh	Pueblo of Zuni
The White Mountain Apache Tribe	Comanche Tribe of Oklahoma
Pueblo of Taos	Pueblo of Pojoaque
Pueblo of Picuris	Pueblo of Nambe
	Pueblo of Kewa

The Carson National Forest sent letters specific to the proposal for TSV's Phase 1 projects to all of the tribes listed above on December 3, 2010. Three tribes (The Navajo Nation, The Taos Pueblo and The Comanche Nation) responded with letters (neither the Navajo or Comanche nation had any concerns with the proposal). In addition to tribal representatives receiving a description of the proposed action during scoping, they will also receive this draft EIS when it is available for comment.

Appropriate members of each tribe, including governors, chairpersons, culture program managers, and Native American Graves and Repatriation Act (NAGPRA) specialists, are sent the quarterly Carson National Forest's quarterly schedule of proposed actions. The schedule has included the proposal for TSV's Phase 1 projects since January 2011. The tribes are also contacted annually with a proposed project list.

A meeting was also conducted with Taos Pueblo officials and Carson Forest Supervisor, Kendall Clark, concerning the proposed action. Pueblo officials expressed concern related to the proposed Main Street Lift and how it may encourage trespass on nearby Pueblo lands. Although the forest supervisor assured officials the proposed lift would not operate during the summer, Taos Pueblo's concern was identified as a significant issue and carried forward in the analysis.

Taos Ski Valley and Taos Pueblo

In addition to the Forest Service consultation process, TSV and the Taos Pueblo meet regularly to discuss current and future ski area operations and tribal concerns. Members of TSV and the Taos Pueblo have met to review the projects outlined in the MDP including those projects that are part of this EIS. Several concerns were initially raised by the Taos Pueblo including summer hikers trespassing on Taos Pueblo land, avalanche blasting, and above treeline snowmaking infrastructure. Taos Ski Valley has committed to implementing a communication strategy for guests and resort operations that are designed to avoid trespassing incidents. Additionally, TSV clarified that the proposed actions are not anticipated to increase avalanche blasting in the Main Street area (this in-bounds area already receives routine avalanche control work by TSV ski patrol), and no above treeline snowmaking infrastructure is proposed. Taos Ski Valley plans to meet with appropriate members of the Taos Pueblo to further discuss on-going concerns with TSV operations and the 2010 MDP projects.

Issues

Using the comments from the public, other agencies, and tribes, the interdisciplinary team developed a list of issues to be addressed in the draft EIS. The Forest Service separated the issues into two groups: significant and non-significant issues. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues were identified as those: (1) outside the scope of the proposed action; (2) already decided by law, regulation, forest plan, or other higher level decision; (3) irrelevant to the decision to be made; or (4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…" A list of non-significant issues and reasons regarding their categorization as non-significant may be found in the project record. The Carson NF identified the following significant issues during scoping:

Main Street and Ridge Lifts

The hike-to terrain on Kachina Peak and West Basin Ridge provides the adventure and solitude that helps define the TSV experience.[8] As proposed, the Main Street and Ridge lifts would change some of the existing hike-to only terrain within TSV's SUP area to lift-served and hike-to skiing; thereby, increasing use of West Basin Ridge and Kachina Peak and altering the current experience. The proposed Main Street Lift's upper terminal may also be visible from the Wheeler Peak Wilderness and there is potential for the proposed Main Street Lift to induce skiers and hikers to trespass onto Taos Pueblo tribal lands.

Indicators:

- Anticipated changes in existing use patterns on West Basin Ridge, Highline Ridge, and Kachina Peak.
- Extent (acres) of hike-to terrain within the SUP area.

[8] "Kachina Peak" was named by TSV's founder, Ernie Blake, soon after the ski area opened in the 1950s. The name was chosen to help associate TSV with the culture of the southwest.

- Disclosure of impacts to federally listed threatened, endangered, and proposed species, Forest Service sensitive species, migratory birds, and management indicator species (MIS) and their habitats.
- Disclosure of impacts to the Wheeler Peak Wilderness viewshed.
- Potential for access to Taos Pueblo lands.

Resort Access

Proposed reconfigurations of the parking lot and East Guest Drop-Off Area would alter the "sense of arrival" at TSV, as well as vehicular circulation and pedestrian access to the base area and local businesses.

Indicators:

- Anticipated changes to the guest arrival experience at TSV.
- Changes in pedestrian circulation between the guest drop-off and local businesses at the base area.

Snowtubing Center and Parking Lot Reconfiguration

Construction and operation of the proposed Snowtubing Center and the parking lot reconfiguration have the potential to affect waters of the U.S., including wetlands, within the Rio Hondo watershed.

Indicators:

- Potential impacts (acres) to existing waters of the U.S., including wetlands, from construction and operation of the Snowtubing Center, as well as implementation of the parking lot reconfiguration.
- Potential impacts to any Clean Water Act (CWA) impaired or threatened waterbody segments from construction and operation of the Snowtubing Center, as well as the parking lot reconfiguration.
- Quantification of the change in snowmaking coverage (acres) and water use (acre feet) and impacts from water diversions.

Other Proposed Projects Not Specifically Addressed in Issues/Indicators

The physical, biological, and social effects of the following proposed projects will also be captured within specific resource analyses in chapter 3.

- Lift replacements (lifts 4, 5, and 7)
- Wild West and Minnesotas Glades
- The Mountain Bike Trail
- The Adventure Center (snowshoe trails)

Other Topics Considered

Vegetation

Plant communities (including threatened, endangered, and sensitive species and regionally important plants) may be impacted as a result of the proposed projects. The analysis will identify any threatened, endangered, and Forest Service Region 3 sensitive plant species and habitat. Additionally, the analysis will quantify the acreage of proposed ground disturbance, overstory removal, and impacts to riparian vegetation.

Wildlife and Aquatic

Implementation of proposed projects (including construction and use) could affect wildlife and aquatic species. In addition to analysis of effects on federally listed threatened, endangered, and candidate species, Forest Service Region 3 sensitive species, MIS, and migratory birds, the analysis will quantify existing wildlife and aquatic habitat (acres) by species and any proposed alteration/removal (acres) by species and determine effects.

Vehicular and Pedestrian Circulation

The proposed parking lot reconfiguration and East Guest Drop-Off Area have potential to change access on Twining Road to the southern end of the Village of Taos Ski Valley. The parking and access analysis will provide detailed discussion on existing and proposed circulation in Taos Ski Valley.

Winter and Summer Recreation Experiences

The proposed replacement of lifts 4, 5 and 7, the addition of the Minnesotas and Wild West glades, operation of the Snowtubing Center, the Mountain Biking Trail, and the Adventure Center (snowshoe trails) all have potential to alter the winter and summer recreational experience at TSV. The recreation analysis will provide a discussion of the effects from the proposed projects on recreationists and their experiences.

Social and Economic Factors

Taos Ski Valley plays an import social and economic role within Taos County. Current ski area visitation trends, as well as proposed projects (particularly base area development and changes in ski area access) have the potential to affect the short-term/long-term sustainability of TSV. The socio-economic analysis will provide a discussion of the effects from the proposed projects on social and economic resources in the northern New Mexico—focusing on the Village of Taos Ski Valley, the Town of Taos, and Taos County.

Environmental Justice

In compliance with Executive Order 12898 – Environmental Justice, the socio-economic analysis will include a discussion of any disproportionately high and adverse human health or environmental effects on minority and low-income populations from the proposed projects.

Visual Quality

Proposed projects may affect the visual character of the SUP area. New gladed areas, as well as lift installations in the high alpine area on Kachina Peak and West Basin Ridge, have potential to be visible from within and outside of the ski area. These projects may also be visible from the adjacent Wheeler Peak Wilderness. The visual quality analysis will discuss visual quality objectives of the SUP area as defined by the 1986 Carson Forest Plan. It will also analyze the incremental effects to the scenic environment resulting from the alternatives compared to historic landscape alterations within the SUP area. Finally, it will discuss the potential visual effects from the Wheeler Peak Wilderness.

Soils

Proposed ground disturbance has the potential to increase erosion. The soils and watershed analysis will identify site-specific soil conditions and erosion rating, quantify the area of temporary and permanent disturbance according to soil erodibility classes, and describe any resulting increase in erosion hazard.

Air Quality and Climate Change

Short-term, construction related activity, as well as potential increases in vehicular traffic related to increased visitation, could negatively impact air quality in the region. The air/climate analysis will provide a narrative of the existing air quality in the project area, and the predicted effects of TSV's operations.

Eligible Wild and Scenic River/Wilderness

Congressionally designated wild and scenic rivers and wilderness areas are protected. As such, the document will disclose the effects to any eligible wild and scenic rivers, wilderness, and wilderness study areas, and inventoried roadless areas.

Other Required Disclosures

The National Environmental Policy Act at 40 CFR 1502.25(a) directs "to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with other environmental review laws and executive orders." In addition to requisite Forest Service approvals, consultation with the following entities, or permits, may be required to implement any approved projects.

- Fish and Wildlife Coordination Act – the amendments enacted in 1946 require consultation with the U.S. Fish and Wildlife Service (USFWS) and the fish and wildlife agencies of states where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted [for snowmaking]…or otherwise controlled or modified" by any agency under a federal permit or license. Consultation is to be undertaken for the purpose of "preventing loss of and damage to wildlife resources."
- National Historic Preservation Act – Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of their

undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment.

- Endangered Species Act (1973) – Section 7 of the Endangered Species Act (ESA) requires all federal agencies to consult with the National Marine Fisheries Service (NMFS) for marine and anadromus species or the U.S. Fish and Wildlife Service (USFWS) for fresh-water and wildlife, if they are proposing an "action" that may affect listed species or their designated habitat.
- Village of Taos Ski Valley Burn Permit

Chapter 2. Alternatives, Including the Proposed Action

This chapter includes a description of each alternatives considered for Taos Ski Valley's 2010 Master Development Plan (MDP)—Phase 1 Projects. Maps of the alternatives are found in appendix A. This section also presents the alternatives in comparative form (Table 1) by defining the components in each alternative and providing a clear basis for choice among options by the decision maker and the public. Table 2 describes the mitigation measures to be applied to proposed activities in alternatives 2 and 3, with reasons why they are required. Table 3, at the end of this chapter, summarizes the effects of each project component. Effects are described in detail in Chapter 3.

Alternatives Considered in Detail

In addition to the proposed action, a second action alternative (alternative 3) and the required no action alternative (alternative 1) are analyzed in detail in this Draft EIS. Alternative 3 was developed in response to issues raised by the public during scoping. None of the alternatives would change the boundary of Taos Ski Valley's (TSV) special use permit (SUP), which is 1,268 acres.

Alternative 1 – No Action

The National Environmental Policy Act (NEPA) regulations require a no action alternative be included for analysis alongside the action alternatives.[9] By definition, a no action alternative represents a continuation of existing management practices without changes, additions, or upgrades to the existing ski area infrastructure and trail system. As such, no new projects that would improve the recreational experience of TSV guests would be implemented as a result of the no action alternative. Brief descriptions of existing on-mountain facilities and services are provided below, and map 1 in appendix A graphically depicts the no action alternative.

Lifts

Alternative 1 would maintain the current lift network, composed of 13 chairlifts: 4 quad chairlifts; 1 triple chairlift; 5 double chairlifts; and 3 surface lifts. Under this alternative TSV's lift network would remain in its current configuration, and the fixed grip lift technology that has historically been operated on TSV would be maintained.

Terrain

Alternative 1 would not change the total number of acres of lift-served (420 acres) or hike-to (214 acres) terrain, or the number of trails serviced by lifts. The developed ski trail network is comprised of 110 lift-served trails, accommodating the entire range of skier ability levels, from beginner to expert. There are large, dense forested areas throughout the SUP area that would continue to essentially preclude skier use. Under alternative 1, the existing skiable terrain would be maintained in its current configuration.

[9] 40 CFR 1502.14(d)

Alternative Winter Recreational Activities

Alternative 1 would maintain after hours snowtubing on *Strawberry Hill* as a popular activity at TSV. Alternative 1 would not offer additional winter recreational activities, such as a developed snowshoe trail system.

Summer Recreational Activities

Alternative 1 would continue to offer chairlift rides during the summer on Lift 1. Dispersed mountain biking would still occur under this alternative, but there would be no developed mountain biking trails within the SUP.

Resort Access

Under alternative 1, guests would continue to access base area facilities by arriving at the Pagoda on Sutton Place Road, walking uphill (approximately 30 feet in elevation) through the Village to access guest service facilities and Lift 1.

Additionally, access through the parking lots and to Twining Road would continue to be influenced by multiple circumstances, including vehicle parking, the shuttle service, pedestrians and residents in cars accessing Twining Road.

Alternative 2 – Proposed Action

Alternative 2 is the proposed action modified after public scoping, to address identified resource and ski area issues related to two proposed projects: the proposed Snowtubing Center and the proposed Mountain Bike Trail. All of the other proposed project components, including new and realigned lifts, lift replacements, glading, and parking lot reconfigurations are as originally described in the scoping document provided to the public for comment. The alternative presented here is the modified proposed action.

Implementation of alternative 2 would take place over the course of 5 to 10 years. It is important to note that all proposed projects and activities are located within TSV's existing 1,268-acre SUP area, administered by the Carson National Forest (NF) and/or on private lands currently owned by TSV. A detailed description of alternative 2 follows.

New Lifts

Main Street Lift

Taos Ski Valley has considered concepts for providing lift service up to Kachina Peak for decades. The concept for a lift on Kachina Peak can be traced back to Ernie Blake in 1965, with numerous references thereafter. This is documented in TSV's 1981 MDP. The proposal for lift service to Kachina Peak in alternative 2 would:

- Construct a 2,560-foot long fixed-grip, triple chairlift, with a capacity of approximately 1,200 people-per-hour (pph). The lower terminal would be located on a raised rock outcrop (11,340 feet in elevation), just below the base of the hill that leads into *Hunziker Bowl*. The upper terminal would be on a natural bench, below the ridgeline of Kachina Peak (at approximately 12,450 feet in elevation). Depending on the final engineering design for the lift, approximately ten 40- to 60-foot towers would be needed (each tow

would have temporary and permanent ground disturbance, which has been accounted for in the Water, Wetlands and Soils Resources section in chapter 3). By design, this would be a low capacity lift, in accordance with the type and amount of terrain that it would serve.

- Remove 1.6 acres of trees for the Main Street Lift lower terminal and lift alignment. Merchantable timber would be removed from the site. Non-merchantable timber may be piled and burned (refer to Table 2 for mitigation measures).
- Construct a small (roughly 250 square feet) ski patrol facility into the top terminal infrastructure in order to provide room for staff, medical equipment, and other gear. This facility would not be any taller than the top terminal of the lift.
- Bury a power line within an existing maintenance road (*Easy Trip*) from the top terminal of Lift 4 to the bottom terminal of the Main Street Lift, using a vibrating plow to minimize soil disturbance.
- Incorporate approximately 1,100 vertical feet (63 acres) of existing expert terrain into TSV's lift network and trail system.

Ridge Lift

The proposal for lift service to West Basin Ridge in alternative 2 would:

- Construct an 800-foot long fixed grip, triple chairlift with a capacity of approximately 1,200 pph. The lower terminal would be located in West Basin, below the top of Lift 8 (11,160 feet in elevation). The upper terminal would be on West Basin Ridge (11,700 feet in elevation).
- Remove 0.7 acre of trees for the Ridge Lift lower and upper terminals and lift alignment. Merchantable timber would be removed from the site and non-merchantable timber may be piled and burned (refer to Table 2 for mitigation measures).
- Bury a power line within an existing maintenance road from the top terminal of Lift 8 to the bottom terminal of the Ridge Lift, using a vibrating plow to minimize soil disturbance.
- Incorporate approximately 550 vertical feet (22 acres) of existing expert terrain into TSV's lift network and trail system.

Note: Although the proposed Main Street and Ridge lifts would provide lift access to areas on Kachina Peak and West Basin Ridge, the existing hiking routes would be maintained for those who value the sense of accomplishment and vigor associated with the hike itself.

Glades

Alternative 2 includes two new gladed areas discussed in detail below. Thinning activities would occur gradually over a 5-year period, with small diameter dead and dying trees being removed first, and additional trees removed over time to create skiable terrain. Within the gladed areas, thinning would not occur evenly; trees and clumps of trees would be thinned to an average spacing of 20 to 60 feet, to create a skiable terrain between standing trees extending down the fall-line of the slope. Most of the trees to be removed would be smaller than 10 inches in diameter-at-breast-height (dbh). For safety, all existing hazard trees would be removed from the

gladed areas. Trees that have high potential to fall due to lean angle, exposed roots, or broken crowns are considered hazard trees.[10] It is likely some hazard trees could occur adjacent to the proposed gladed ski runs and may need to be removed, if they have the potential to fall into the gladed ski run.

Tree felling in both areas would be performed by hand, using chainsaws. No heavy equipment would be used. Trees would be lopped and scattered throughout the gladed area; some felled trees may be piled and burned (refer to Table 2 for mitigation measures).

Note: In conjunction with implementation of the proposed glades, TSV would work with the Carson NF to assemble a glading plan that is responsive to both the resort's operational/ recreational needs, as well as the Carson NF's forest health objectives. The glading plan, which would resemble the plan assembled for the *North American Glade*, would address elements such as, but not limited to, species and size selection, tree mortality (i.e., targeting dead/dying trees), percent removal, and habitat characteristics.

Wild West Glades

The proposal for the Wild West Glades (which are hike-to accessible from the top of Lift 2 and lift-served accessible from the proposed Ridge Lift, if installed) in alternative 2 would:

- Thin approximately 31.6 acres of spruce-fir trees from the top of West Basin Ridge to *Lower Stauffenberg*. Thinning would create navigable openings among the trees (averaging 20 to 60 feet), to form skiable lines running down the slope.
- Provide additional terrain for advanced intermediate and expert skiers.

Minnesotas Glades

The proposal for Minnesotas Glades (accessible from the bottom of Lift 7 area) in alternative 2 would:

- Thin approximately 40.3 acres of spruce-fir trees, with varying percentages of tree removal (between 10 and 50 percent of existing trees). Spaces between tree clumps left in place would range from 20 to 60 feet, forming skiable lines running down the slope.
- Provide skiable terrain appropriate for expert skiers and riders.

Lift Replacements

The proposal to replace three of TSV's existing lifts in alternative 2 is designed to upgrade the existing lift network, thereby improving operational efficiencies and use of existing and proposed terrain.

[10] Broken crown trees can be a safety hazard attributed to an increased susceptibility to fall during high wind events. These trees have major portions of the crown missing due to disease, rotting, or physical damage caused by heavy snow, lightning strike or wind events. Loss of a portion of the crown creates an unbalanced weight distribution for the tree. During high wind events these trees may split, lose the rest of the crown or may cause the tree to fall entirely.

Lift 4 (Kachina Lift)

- Replace the existing Lift 4 (a fixed-grip quad installed in 1991) with a detachable quad chairlift.
- Grade 0.7 acre at the top and bottom terminal locations to accommodate larger terminals. Lift 4 would remain in the same alignment and the same top and bottom terminal locations would be used. Taos Ski Valley would attempt to reuse tower footers, but the Water, Wetlands and Soils Resources section in chapter 3 accounts for new disturbance for all towers nonetheless.
- Increase the capacity from 1,800 pph to 2,400 pph.
- Reduce lift ride times by more than half (to 4.5 minutes).

Lift 5 (High Five Lift)

- Replace Lift 5 (a fixed-grip double installed in 1973) with a high-speed detachable quad chairlift.
- Grade 1.2 acres at the top and bottom terminal locations to accommodate larger terminals. Lift 5 would remain in the same alignment and the top and bottom terminal locations would be used. Taos Ski Valley would attempt to reuse tower footers, but the Water, Wetlands and Soils Resources section in chapter 3 accounts for new disturbance for all towers nonetheless.
- Increase the capacity from 1,200 pph to approximately 2,400 pph. This would substantially increase out-of-base capacity and reduce the need for operating lifts 1 and 5 simultaneously.
- Reduce lift ride times from 7.5 minutes to 3.5 minutes.

Lift 7 (Maxie's Lift)

- Replace Lift 7 (a fixed-grip triple installed in 1984) with a fixed-grip quad chairlift.
- Grade 0.9 acre at the top and bottom terminal locations to accommodate larger terminals. Lift 7 would remain in the same alignment and the top and bottom terminal locations would be used. Taos Ski Valley would attempt to reuse tower footers, but the Water, Wetlands and Soils Resources section in chapter 3 accounts for new disturbance for all towers nonetheless.
- The hourly lift capacity would not change.

Snowtubing Center

The Snowtubing Center is proposed so TSV could offer snowtubing throughout the day and evening without interrupting skiers and riders on *Strawberry Hill*. The proposal for the Snowtubing Center in alternative 2 would:

- Develop a dedicated snowtubing facility near Lift 3—partially on private lands (0.8 acre) and partially on NFS lands (0.7 acre), within TSV's existing SUP area. The Snowtubing Center would include four distinct lanes, varying from 250 to 280 feet long, separated by

snow berms. A roughly 250-foot long carpet conveyor lift would bring tubers from the run-out back to the top.

- Form tubing lanes using machine made snow. Taos Ski Valley proposes to extend (on private land) existing snowmaking lines from Lift 3. Taos Ski Valley holds sufficient water rights to add the Snowtubing Center to its snowmaking system.
- Accommodate approximately 90 guests per hour. The existing Pit House (located between *Strawberry Hill* and the Children's Center) would continue to function as a warming hut, providing guest services and restrooms to snowtubers, as well as skiers and snowboarders.
- Install a low-level lighting system to allow TSV to offer snowtubing into the evening, which would benefit overnight guests and day skiers/riders who wish to extend their day.
- Remove trees and grade approximately 0.5 acre of NFS lands to create run outs for the snowtubing lanes.
- Use the existing access over the Rio Hondo, between the parking lot and the Pit House, to accommodate pedestrian access, as well as construction and maintenance vehicles accessing the Snowtubing Center.
- Provide parking at existing parking lots for users of the proposed Snowtubing Center. A number of parking spaces in TSV's Armadillo lot would likely be reserved for snowtubers.

Adventure Center (Snowshoeing)

The proposed Adventure Center would provide a designated and marked interpretive trail system (one main loop trail with interconnecting segments) for snowshoeing, to further supplement winter activities offered at TSV. Interpretive signage would be installed/removed seasonally to provide TSV with flexibility to modify the trail as needed. A trail would begin near the Little Maintenance Facility in the northeast portion of the existing SUP area. The entire trail system would be approximately 2 miles long. The proposal for the Adventure Center in alternative 2 would:

- Create trails over the snow once sufficient snow coverage is available. Specific trees measuring less than 4 inches diameter may be removed to lay out the trail. The snowshoe trails will be designed to accommodate up to 75 guests at-one-time. Guest services would be located in the nearby Pit House.
- Provide parking at existing parking lots for users of the proposed Adventure Center. A limited number of parking spaces in TSV's Deer lot would likely be reserved for snowshoers. Visitors who want to snowshoe would walk to the trailhead.

Mountain Bike Trail

A lift-served Mountain Bike Trail (approximately 3.6 miles) is proposed between the top of Lift 1 and the base area. Cyclists would be able to ride Lift 1 and descend this trail during TSV's summer operation period. With an average grade of 8.5 percent, this trail is designed to minimize the need for pedaling and braking to provide a fun experience for riders of intermediate ability levels. The proposal for the Mountain Bike Trail in alternative 2 would:

- Require minimal tree removal and approximately 1.7 acres of ground disturbance, by strategically locating switchbacks on naturally occurring benches and placing trail segments in areas currently cleared for ski trails. Trees would be lopped and scatted or removed from the site.
- Avoid conflicts with mountain operations vehicles by locating the trail away from the existing maintenance roads.

Resort Access

Alternative 2 includes projects that are designed to address issues related to vehicular and pedestrian circulation between day parking lots and Lift 1/Lift 5. Map 4 in appendix A depicts how TSV's eastern day parking lots (Armadillo, Bear, Bison, and Coyote) are proposed to be reconfigured to better accommodate traffic circulation and pedestrian access to the base area.

East Guest Drop-Off Area

The proposal to improve pedestrian access to the resort in alternative 2 would:

- Create a new guest drop-off area on Thunderbird Road (East Guest Drop-Off Area).
- Realign the existing footbridge to provide better access from the proposed East Guest Drop-Off Area to Alpine Village.

Note: Sutton Place Road would continue to provide vehicular access for guests staying at Edelweiss, Snakedance, and the Hotel St. Bernard. The proposed East Guest Drop-Off Area on Thunderbird Road would be designed to provide a visual orientation to the lifts and the core village as seen from the shuttles. This is important to the sense of arrival at any resort. It would also eliminate the elevation difference between the drop-off area and Lift 1/Lift 5.

The existing footbridge connecting the parking lots to Alpine Village would be realigned to provide access from the new East Guest Drop-Off Area to the businesses in Alpine Village. Pedestrians would have the option to continue using the path parallel to Sutton Place Road to access the base area or access the base area through the new East Guest Drop-Off Area. The effects of this proposal will be included with the parking lot reconfiguration described below.

Parking Lot Reconfiguration

The proposal to improve the parking efficiency and traffic flow in alternative 2 would:

- Reconfigure the eastern portion of TSV's day parking lots (i.e., Armadillo, Bison, and Bear) to allow Bison to become a thoroughfare primarily for residents of Taos Ski Valley driving to Twining Road, and access to the East Guest Drop-Off Area.
- Construct an extra parking area north of Armadillo to alleviate the loss of parking on Bison.
- Remove 1.4 acres of trees and grade 3.0 acres to accommodate additional parking and improvements to the entry road (i.e., where Highway 150 meets the parking lots).
- Re-grade 9.9 acres of the existing parking lot to improve vehicular access to the new East Guest Drop-Off Area and circulation through the parking lots.

Alternative 3

Alternative 3 was developed in response to issues raised by the public during scoping. Alternative 3 does not include the Main Street Lift or the Ridge Lift in order to address the following issues related to the proposed lifts:

- The proposed Main Street Lift and Ridge Lift would alter the current skier/rider experience of hiking from the top of Lift 2 to ski *Main Street* and *Hunziker* and the West Basin Ridge chutes.
- The top terminal of the proposed Main Street Lift may be visible from Wheeler Peak, the highest peak in the Wheeler Peak Wilderness and all of New Mexico.
- The proposed Main Street Lift could have the potential to encourage hikers to trespass onto Taos Pueblo lands.

In order to address the following issue related to resort access, alternative 3 does not include the East Guest Drop-Off Area:

- The proposed East Guest Drop-Off Area has potential to negatively affect local business owners that currently have shops located along the Sutton Place Road, where visitors can easily see and enter on their way to the base area from the parking lot.

In order to address the following issues related to the proposed Snowtubing Center and parking lot reconfiguration, alternative 3 does not include these components:

- Construction and operation of the proposed Snowtubing Center and the parking lot reconfiguration have the potential to negatively affect waters of the U.S., including wetlands, within the Rio Hondo watershed.

Glades

Alternative 3 includes two new gladed areas discussed in detail under alternative 2.

Note: In conjunction with implementation of the proposed glades, TSV would work with the Carson NF to assemble a glading plan that is responsive to both the resort's operational/recreational needs, as well as the Carson NF's forest health objectives. The glading plan, which would resemble the plan assembled for the *North American Glade*, would address elements such as, but not limited to, species and size selection, tree mortality (i.e., targeting dead/dying trees), percent removal, and habitat characteristics.

Wild West Glades

The proposal for Wild West Glades (hike-to accessible from the top of Lift 2) in alternative 3 would:

- Thin approximately 31.6 acres of spruce-fir trees from the top of West Basin Ridge to *Lower Stauffenberg*. Thinning would create navigable openings among the trees (averaging 20 to 60 feet), to form skiable lines running down the slope.
- Provide additional terrain for advanced intermediate and expert skiers.

Minnesotas Glades

The proposal for Minnesotas Glades (accessible from the bottom of Lift 7 area) in alternative 3 would:

- Thin approximately 40.3 acres of spruce-fir trees, with varying percentages of tree removal (between 10 and 50 percent of existing trees). Spaces between tree clumps left in place would range from 20 to 60 feet, forming skiable lines running down the slope.
- Provide skiable terrain appropriate for expert skiers and riders.

Lift Replacements

The proposal to replace three of TSV's existing lifts in alternative 3 is designed to upgrade the existing lift network, thereby improving operational efficiencies and use of existing and proposed terrain.

Lift 4 (Kachina Lift)

- Replace the existing Lift 4 (a fixed-grip quad installed in 1991) with a detachable quad chairlift.
- Grade 0.7 acre at the top and bottom terminal locations to accommodate larger terminals. Lift 4 would remain in the same alignment and the same top and bottom terminal locations would be used. Taos Ski Valley would attempt to reuse tower footers, but the Water, Wetlands and Soils Resources section in chapter 3 accounts for new disturbance for all towers nonetheless.
- Increase the capacity from 1,800 pph to 2,400 pph.
- Reduce lift ride times by more than half (4.5 minutes).

Lift 5 (High Five Lift)

- Replace Lift 5 (a fixed-grip double installed in 1973) with a high-speed detachable quad chairlift.
- Grade 1.2 acres at the top and bottom terminal locations to accommodate larger terminals. Lift 5 would remain in the same alignment and the top and bottom terminal locations would be used. Taos Ski Valley would attempt to reuse tower footers, but the Water, Wetlands and Soils Resources section in chapter 3 accounts for new disturbance for all towers nonetheless.
- Increase the capacity from 1,200 pph to approximately 2,400 pph. This would substantially increase out-of-base capacity and reduce the need for operating lifts 1 and 5 simultaneously.
- Reduce lift ride times from 7.5 minutes to 3.5 minutes.

Lift 7 (Maxie's Lift)

- Replace Lift 7 (a fixed-grip triple installed in 1984) with a fixed-grip quad chairlift.
- Grade 0.9 acre at the top and bottom terminal locations to accommodate larger terminals. Lift 7 would remain in the same alignment and the top and bottom terminal locations

would be used. Taos Ski Valley would attempt to reuse tower footers, but the Water, Wetlands and Soils Resources section in chapter 3 accounts for new disturbance for all towers nonetheless.

- The hourly lift capacity would not change.

Adventure Center (Snowshoeing)

The proposed Adventure Center would provide a designated and marked interpretive trail system for snowshoeing, to further supplement winter activities offered at TSV. Interpretive signage would be installed/removed seasonally to provide TSV with flexibility to modify the trail as needed. A trail would begin near the Little Maintenance Facility in the northeast portion of the existing SUP area. The entire trail system would be approximately 2 miles long. The proposal for the Adventure Center in alternative 3 would:

- Create trails over the snow once sufficient snow coverage is available. Specific trees measuring less than 4 inches diameter may be removed to lay out the trail. The snowshoe trails will be designed to accommodate up to 75 guests at-one-time. Guest services would be located in the nearby Pit House.
- Provide parking at existing parking lots for users of the proposed Adventure Center. A limited number of parking spaces in TSV's Deer lot would likely be reserved for snowshoers. Visitors who want to snowshoe would walk to the trailhead.

Mountain Bike Trail

A lift-served Mountain Bike Trail (approximately 3.6 miles) is proposed between the top of Lift 1 and the base area. Cyclists would be able to ride Lift 1 and descend this trail during TSV's summer operation period. With an average grade of 8.5 percent, this trail is designed to minimize the need for pedaling and braking to provide a fun experience for riders of intermediate ability levels. The proposal for the Mountain Bike Trail in alternative 3 would:

- Tree removal would be minimal, and ground disturbance would equate to 1.7 acres, by strategically locating switchbacks on naturally occurring benches and placing trail segments in areas currently cleared for ski trails. Trees would be lopped and scatted or removed from the site.
- Avoid conflicts with mountain operations vehicles by locating the trail away from the existing maintenance roads.

Table 1. Summary of the project components proposed by alternative

Proposed Project	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3
Main Street Lift	No	**Yes**	No
Ridge Lift	No	**Yes**	No
Wild West Glades	No	**Yes**	**Yes**
Minnesotas Glades	No	**Yes**	**Yes**
Snowtubing Center	No	**Yes**	No
Adventure Center (snowshoeing)	No	**Yes**	**Yes**
Mountain Bike Trail	No	**Yes**	**Yes**
Replacements of lifts 4, 5, and 7	No	**Yes**	**Yes**
East Guest Drop-Off Area	No	**Yes**	No
Parking Lot Reconfiguration	No	**Yes**	No
Realignment of Alpine Village footbridge	No	**Yes**	No

Mitigation Measures Common to Action Alternatives

Descriptions of the alternatives also include relevant mitigation measures that could reduce the impacts of the proposed project. Examples include: forest plan requirements; best management practices (BMPS); scientific research; statutory and regulatory requirements related to federal, state, and local laws and regulations; and from experience in designing similar projects. Mitigation measures are devised in the pre-analysis and analysis phases. The bulk of the mitigation measures are considered common management practices historically used by ski area managers in alpine and sub-alpine environments, to prevent or decrease potential resource impacts. They are highly effective methods that can be planned in advance and adapted to site conditions, as needed. Mitigation measures were designed by the Forest Service and specialists involved in this analysis. The potential effects of implementing the action alternatives (provided in chapter 3) were analyzed with mitigation measures applied. Table 2 describes the mitigation measures to be applied to proposed activities in alternatives 2 and 3, with reasons why they are required.

Table 2. Mitigation measures applied to action alternatives 2 and 3, by resource

Mitigation Measures	Why
Recreation	
Maintain existing available hiking routes on Highline and West Basin ridges (applies to alternative 2 only).	To avoid displacing people that may want to hike to Kachina or the chutes of West Basin Ridge, after Main Street Lift and Ridge Lift have been installed.
Maintain a closure, as appropriate, to prevent people from riding the Main Street Lift and skiing/riding down to Highline Ridge (applies to alternative 2 only).	To prevent guests that ride the Main Street Lift from accessing the hike-to terrain on Highline Ridge
Parking and Traffic Circulation	
When possible, avoid any construction during the winter.	To avoid impairing circulation in the parking lots, when TSV is open during the winter.
Visual Quality	
During new lift installation, glading, and mountain bike and snowshoe trail development, cut stumps as low as possible to the ground	To avoid safety hazard and to meet visual objectives.
Bury all utilities associated with projects proposed in the action alternatives.	To meet visual objectives and to prevent damage to utility lines.
As per Forest Service Handbook (FSH) No. 617, "National Forest Landscape Management for Ski Areas," meet reflectivity guidelines for all proposed facilities. This includes any reflective surfaces (metal, glass, plastics, or other materials with smooth surfaces) that do not blend with the natural environment. They will be covered, painted, stained, chemically treated, etched, sandblasted, corrugated, or otherwise treated to meet the solar reflectivity standards.	To meet visual quality objectives of facilities blending with the natural environment.
As per FSH No. 617, "National Forest Landscape Management for Ski Areas," use recommended colors for ski areas on all proposed facilities. Bright colors are inappropriate for the forest setting. The colors will be muted, subdued colors to blend well with the natural color scheme."[b]	To meet visual quality objectives of facilities blending with the natural environment.
Cultural and Heritage Resources	
Although site-specific surveys have been conducted, if undocumented historic and/or prehistoric properties are located during ground disturbing activities or planning activities associated with approved construction activities, they will be treated as specified in 36 CFR 800.11 concerning Properties Discovered During Implementation of an Undertaking.	To protect cultural resources.

Table 2. Mitigation measures applied to action alternatives 2 and 3, by resource

Mitigation Measures	Why
Install orange safety fencing around designated archaeological sites to protect from ground-disturbing construction activities.	To protect known cultural resources.
Air Quality	
To the extent practicable, promptly install site improvements and revegetate disturbed areas.	To reduce the potential for dust emissions
As necessary and practical, water down any exposed soil caused by grading (e.g., lift terminal and snowtubing runout areas)	To prevent excessive amounts of dust generated during construction.
Keep slash piles for burning less than 15 feet in diameter and 6 feet high.	To minimize air quality impacts from pile burning and prevent damage to soils.
Obtain New Mexico Environmental Department Air Quality Bureau permit for any slash disposed through burning.	To comply with state laws.
Wildlife	
Prior to glading, survey the area for red squirrel activity and identify red squirrel middens. Do not remove or trim the lower branches of trees within a 25-foot radius of a midden and retain large, downed logs within a 50-foot radius, unless there is a potential hazard to skiers.	To minimize impacts to red squirrel, a prey species for the northern goshawk and American marten (FS sensitive species). Keeping lower branches will provide habitat security for Canada lynx, snowshoe hare, and American marten.
Within gladed runs, retain 3 snags per acre greater than 10 to 12 inches dbh, unless there is a potential hazard to skiers.	To be consistent with Carson Forest Plan guidelines. To provide habitat for cavity nesting birds, such as hairy woodpecker, and other wildlife species that depend on snags.
Where there are clumps of aspen in the gladed runs, retain aspen snags greater than 10 inches dbh, unless there is a potential hazard to skiers.	To minimize effects to aspen dependent wildlife species, such as the grouse.
Within gladed runs, retain standing dead and down trees greater than 8 inches in diameter, within a 30-foot radius of a spring or seep, unless there potential hazard to skiers.	To avoid disturbing a valuable habitat feature within gladed areas.
Retain downed logs in the gladed runs, unless there is a potential hazard to skiers.	To minimize effects on habitat (foraging and nesting) for northern goshawk, American marten, and boreal owl, Forest Service sensitive species and the hairy woodpecker, a Carson management indicator species.
Vegetation	
Survey the top terminal site for Lift 4 replacement and the Main Street Lift alignment for Pecos fleabane and alpine larkspur, prior to ground disturbance. Avoid if technically possible.	To minimize effects to Pecos fleabane and alpine larkspur, two Forest Service sensitive plants.

Table 2. Mitigation measures applied to action alternatives 2 and 3, by resource

Mitigation Measures	Why
When determining what trees to retain in gladed runs, retain aspen over conifers; Douglas-fir over Engelmann spruce; and Engelmann spruce over subalpine (corkbark fir),	Aspen and Douglas-fir trees are more wind-firm. Douglas-fir and Engelmann spruce are longer lived trees than subalpine fir.
When determining what trees to retain in gladed runs, choose trees with healthy crowns. Remove spruce budworm or beetle weakened trees and trees with unhealthy crowns.	To improve forest health.
Thin conifers less than 5 inches dbh.	To enhance existing deciduous species.
Adquately mark the edges of the gladed areas, prior to tree cutting.	To minimize mistakes in clearing limits during glading and construction.
Buck Engelmann spruce trees greater than 5 inches dbh to 3-foot lengths, at time of tree felling. Burn or remove within 12 months.	To help prevent the creation of spruce beetle habitat in slash.
Monitor slash density and do not leave more than 40 tons/acre fuels on the ground at one time.	To prevent increasing fuel loads that could support a wildfire.
Noxious Weeds	
Clean construction equipment prior to entering the TSV SUP area. Clean equipment when returning to the area.	To minimize introduction of noxious weed seeds to NFS lands.
Prior to and during project construction, treat for noxious weeds along travel routes accessing the project area on NFS lands. Travel routes include ski area access roads.	To minimize introduction of noxious weed seeds to NFS lands.
Monitor and treat any existing or new infestations of noxious weeds for a minimum of 3 years after project completion.	To minimize introduction of noxious weed seeds to NFS lands.
Soil, Water, Aquatic, and Wetland Resources	
Best management practices will be applied for all ground disturbing activities to avoid sediment migration from ground disturbance into wetlands.	To comply with the Carson Forest Plan and the Clean Water Act.
A Storm Water Pollution and Prevention Plan will be developed prior to implementation of the Snowtubing Center and Parking Reconfiguration activties. This plan will be approved by the appropriate Forest Service specialist.	To meet required state and federal laws and regulations. To contain sediment onsite and out of the Rio Hondo and to protect soils and enhance conditions for vegetation re-establishment.
Store fuel, oil, and other hazardous materials in structures placed on impermeable surfaces with impermeable berms designed to fully contain the hazardous material plus accumulated precipitation for a period at least equal to that required to mitigate a spill.	To protect water quality of the Rio Hondo.

Table 2. Mitigation measures applied to action alternatives 2 and 3, by resource

Mitigation Measures	Why
Keep heavy equipment out of the Rio Hondo.	To minimize impacts on the water quality of the Rio Hondo.
Identify and flag any wetlands proximate to areas where disturbance will occur from construction related activities. Construction limits will be clearly defined and any identified wetlands will be avoided where possible.	To minimize impacts to wetlands.
Avoid soil-disturbing activities during periods of heavy rain or wet soils.	To minimize soil compaction and erosion.
Implement any work within or directly adjacent stream channels and wetlands, when hydrologic flows are reduced (late-summer and early fall).	To minimize sedimentation and water quality impacts.
Where possible, use existing maintenance roads for construction and routine maintenance of the proposed project components.	To minimize disturbance to ground cover.
In all areas where grading or soil disturbance will occur, topsoil or other organic amendment will be stockpiled and respread following slope grading and prior to reseeding.	To increase successful and prompt revegetation.
Maintain vegetation buffers adjacent to intermittent or perennial drainages and wetlands, to the extent possible. Where avoidance is not possible, appropriate erosion control practices (i.e., silt fences or straw wattles) will be employed.	To minimize impacts to sensitive areas.
During construction activities, use surface netting, in conjunction with mulching.	To reduce potential for soil erosion and sedimentation to the Rio Hondo and control surface erosion.
Do not create slash piles near the Rio Hondo.	To minimize impacts to riparian vegeation and water quality of the Rio Hondo.
Lay felled trees across the riparian zone at 20 to 45 degrees to the stream channel.	To minimize impacts to riparian vegeation and water quality of the Rio Hondo.
Design and construct water bars to discharge surface runoff originating from proposed ski trails into well-vegetated areas.	To effectively disconnect disturbed areas from the stream channel.
In gladed areas, maintain existing organic cover during thinning and slash treatment. If disturbance to the organic cover occurs, replace the disturbance with slash or material from an adjacent layer.	To protect soils and increase successful revegetation of understory after implementation.
Use mechanical subsoiling or scarification of areas determined to have been compacted by construction activities.	To reduce bulk density and restore porosity of soils.

Table 2. Mitigation measures applied to action alternatives 2 and 3, by resource

Mitigation Measures	Why
Re-establish effective ground cover upon completion of ground disturbing activities (mulch, scatter slash) at levels that occurred prior to disturbance.	To minimize soil erosion.
Promptly revegetate all disturbed areas with native plant seed. Seed mixtures and mulches will be noxious weed-free. Non-persistent, non-native perennials or sterile perennials may be used immediately after implementation, while native perennials become established. The Forest Service must approve the seed mixtures prior to implementation.	To minimize soil erosion and the introduction of non-native plant species and noxious weeds.

Alternatives and Project Components Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). A number of project components were considered but dismissed from detailed consideration for reasons summarized below.

An Alternative that Locates the Snowtubing Area near the Snowshoeing Trails

Taos Ski Valley's 2010 Master Development Plan (MDP) and the original proposed action released for public scoping included a snowtubing area, including ancillary facilities, across from the Village of Taos Ski Valley's sewage treatment plant. Together with the snowshoe trail system, the complex was identified as the "Adventure Center." This location was roughly 1 mile from TSV's base area and would have required clearing almost 5 acres of forested land, installing restroom facilities, and constructing a footbridge across the Rio Hondo. The facility's remote location from the base area was also a concern for TSV.

After consideration of the potential effects to vegetation, wildlife habitat, and water resources, as well as the remote location, this alternative was eliminated from detail. The proposed action (alternative 2) was modified to include a snowtubing facility at *Strawberry Hill*, the existing beginner hill and current location of snowtubing at TSV.[11]

An Alternative that Aligns the Snowtubing Lanes to the West

Two potential tubing lane alignments were considered for the proposed Snowtubing Center at *Strawberry Hill*. They were: (1) curving the lanes uphill and to the east or (2) curving the lanes downhill and to the west. To minimize the acreage of disturbance and earth movement within the

[11] The snowshoe trail system included in alternatives 2 and 3 is still located where it was originally proposed.

riparian and wetland area adjacent the Rio Hondo, the tubing lane alignment to the west was eliminated from further consideration.

An Alternative Mountain Bike Trail Alignment

While surveying the proposed Mountain Bike Trail alignment, the biologist discovered the trail would traverse a drainage with steep banks and water flow several times, along the east edge of the *North American Glade*. To avoid creating multiple switchbacks that cross this small drainage, the proposed trail was redesigned to minimize crossings. The new proposal would include drainage features, such as a log bridge, to allow water to flow under the trail. To minimize impacts to water resources from the proposed Mountain Bike Trail, the original alignment was eliminated from detailed study.

An Alternative that Keeps the Existing Footbridge Alignment to Alpine Village

During scoping, local businesses within the Alpine Village complex expressed concern over the location of the proposed East Guest Drop-Off Area at the east end of the parking lots. The proposed East Guest Drop-Off Area would have diverted pedestrians away from the footbridge that routes potential customers through the Village. This could negatively affect Alpine Village businesses. As a result, TSV worked with property owners to redesign the alignment of the footbridge, so there would be a direct connection from the proposed East Guest Drop-Off Area to base area services. This would improve the access to businesses.[12] For the above reasons, the alternative to keep the footbridge in its original alignment, if the East Guest Drop-Off Area is approved, was eliminated from detailed study.

An Alternative that Includes Additional Parking

Additional parking was considered between the Armadillo and Deer lots, but to avoid impacting a wetland and risk causing potential water quality impacts to the Rio Hondo, expansion of the parking lot into this area was eliminated from further consideration.

An Alternative Reconfiguration of the Parking Lots

Realigning the Main Entry Road to Coyote Lot instead of the Bison Lot was considered during the parking reconfiguration planning process. Because the Coyote Lot is larger than the Bison Lot, the loss of that parking lot would have necessitated construction of another parking area elsewhere. The loss of parking in the Bison Lot could be approximately balanced with the relatively minor parking additions included in the proposed action. For these reasons, this alternative was eliminated from detailed study.

An Alternative that Implements All the Projects Identified in the 2010 Master Development Plan

Rather than propose all projects identified within its 2010 MDP at the same time, TSV chose to select priority projects for site-specific NEPA analysis at this time. Upon implementation of any

[12] A new footbridge would be under a Forest Service SUP with the property owner of Alpine Village; however, TSV will be responsible for evaluating the effects of the new realignment.

approved projects, TSV may decide to further move forward with proposing remaining 2010 MDP projects for analysis.

Summary of Effects by Alternative

Table 3 provides a quantifiable summary of the effects of each alternative discussed in detail in Chapter 3 – Affected Environment and Environmental Consequences.

Table 3. Summary of effects by alternative

	Alternative 1	Alternative 2	Alternative 3
Resort Capacity			
Comfortable carrying capacity (people per day)	3,520	4,200	3,730
Proposed capacity increase	0	680	210
Terrain			
Special use permit area (acres)	1,268	1,268	1,268
Lift-served terrain (acres)	**420** (developed [346] + undeveloped [74])	**604** (developed [346] + undeveloped [258])[a]	**460** (developed [346] + undeveloped [114])[b]
Hike-to terrain (acres)	214	102[c]	246[d]
Lifts			
Total number of lifts	13	15	13
New lifts	None	Main Street Lift Ridge Lift	None
Lift Replacements	None	Lift 4 Lift 5 Lift 7	Lift 4 Lift 5 Lift 7
Alternative Summer and Winter Recreation			
Snowtubing Center	Two lanes on Strawberry Hill Operating hours: 5 p.m. to 7 p.m.	Three to four lanes on Strawberry Hill Operating hours: TBD (afternoons and evenings)	Two lanes on Strawberry Hill Operating hours: 5 p.m. to 7 p.m.
Snowshoeing Trails	None	~2 miles	~2 miles
Lift-served Mountain Bike Trail	None	3.6 miles from Lift 1 to the base area	3.6 miles from Lift 1 to the base area

Table 3. Summary of effects by alternative

	Alternative 1	Alternative 2	Alternative 3
Parking			
Parking spaces	1,740	1,631	1,740
East Guest Drop-Off Area	No	Yes	No
Access to Twining Road	Through the parking lots	A dedicated access road	Through the parking lots

Notes:
[a] Under alternative 2, additional lift-served "undeveloped" terrain includes terrain served by the proposed Main Street and Ridge lifts (including Wild West Glades) as well as the Minnesotas Glades.
[b] Under alternative 3, additioanl lift-served "undeveloped" terrain is limited to the proposed Minnesotas Glades.
[c] Under alternative 2, roughly 112 acres of currently hike-to terrain would be become lift-served via the proposed Main Street and Ridge lifts.
[d] Under alternative 3, hike-to terrain increases by roughly 32 acres with the addition of the proposed Wild West Glades.

Chapter 3. Affected Environment and Environmental Consequences

Council on Environmental Quality (CEQ) regulations direct agencies to succinctly describe the environment that may be affected by the alternatives under consideration. As such, chapter 3 describes the existing physical, biological, social, and economic components of the project area which have potential to be affected by implementing any of the alternatives (i.e., the affected environment). Each affected environment description is followed by an environmental consequences discussion that provides an analysis of the potential effects of implementation of each of the alternatives.

Affected Environment

This section summarizes the physical, biological, social, and economic environments of the proposed projects areas and the effects of implementing each alternative on that environment. It also presents the scientific and analytical basis for the comparison of alternatives presented in the environmental consequences section. In the development of the environmental analyses that follow, the best available science was considered and documented in the project record. The environmental analysis focuses on issues identified through the scoping process.

Environmental Consequences

An environmental effect, impact, or consequence is defined as a modification of or change in the existing environment brought about by the action taken. Effects can vary in degree, ranging from only a slightly discernible change to a drastic alteration in the environment. Effects are direct, indirect, or cumulative and may be temporary (short-term) or permanent (long-term). Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and occur later in time or are farther removed in distance, but are still likely to occur within the duration of the project. This analysis considers short-term effects to be any that would occur during implementation of any of the proposed projects. Long-term effects are residual effects that persist during the life of TSV's 40-year SUP.

Cumulative Effects

Cumulative effects are the impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Reasonably foreseeable future actions include activities, developments, or events that have the potential to change the physical, social, economic, and/or biological nature of a specified area. Existing activities, projected activities directly associated with a proposed action, and other reasonably foreseeable future actions provide the basis for defining and analyzing cumulative impacts. To be a cumulative effect, it must overlap in space and time with the direct and indirect effects of the action.

Each section in this chapter incorporates the effects of each of the proposed projects that would implement Phase 1 of Taos Ski Valley's Master Development Plan (MDP). At the end of each section under "Cumulative Effects," other past, present, and reasonably foreseeable future activities listed in appendix B are considered.

Irreversible and Irretrievable Effects

An irreversible effect is a permanent or essentially permanent use or loss of resources. It cannot be reversed, except in the extreme long-term. An irreversible commitment of resources refers primarily to the effects of use of non-renewable resources such as minerals or cultural resources, or to those factors such as soil productivity that are renewable only over long periods of time. An irretrievable effect is a loss of production or use of a renewable natural resource for a period of time, but is reversible. For example, installation of a chairlift will cause a loss of habitat for an extended period. That habitat could be retrieved if the chairlift was removed. Irreversible or irretrievable effects are identified under any resource that may have such effects from any of the proposed projects. The Forest Service recognizes the fact that certain management activities will produce irreversible or irretrievable commitments of resources.

Forest Plan Consistency

The 1986 Carson Forest Plan allocates the entire TSV permit area to Management Area (MA) 16 – Recreation Sites. Management Area 16 standards and guidelines under “Ski Areas” state:

- Administer the existing ski areas in accordance with the direction in the Master Development Plan for each area.
- Plan and monitor watershed treatments and conditions.
- Conduct administrative studies relating to watershed management.

In conjunction with each resource analysis presented in this chapter, a review of the Carson Forest Plan was also conducted in order to determine consistency with forestwide prescriptions and MA standards and guidelines. All of the alternatives were determined to be consistent with the Carson Forest Plan.

Recreation

The scope of this recreation analysis is limited to TSV's permit area and adjacent private lands that compose the ski area. The majority of TSV's lift and trail network, as well as all parking lots, are located on National Forest System (NFS) lands under special use permit (SUP) issued by the Carson National Forest (NF). Taos Ski Valley's SUP covers approximately 1,268 acres. An additional 200 acres of private land encompass the remainder of the resort and related operations. Except for private lands at the base area that include lower portions of *Al's Run*, *Snakedance*, *Edelweiss*, and the *White Feather* skiway, and a small section of private land on the back side at the base of Lift 4, the majority of TSV's existing lift, trail, and infrastructure network is operated on NFS lands under the SUP.

Taos Ski Valley's 2010 Master Development Plan (MDP) was prepared in compliance with the terms and conditions of the resort's SUP.[13] The 2010 MDP replaces TSV's 1981 MDP, which was approved by the Forest Service in 1981.[14]

The 1986 Carson Forest Plan includes 21 separate management areas (MA) for different portions of the forest, based on ecological conditions, historic development, and anticipated future conditions. Management areas 15, 16, 17, 19, and 20 provide much of the guidance for management of the recreation program on the Carson NF. Taos Ski Valley falls within MA 16–Recreational Sites. The Vision for MA 16 is: "All the developments are high quality and well maintained. They fill the needs of users."[15]

National Forest System lands within MA 16 are areas of concentrated recreation use and developed recreation sites. The Carson Forest Plan notes that people have been, and will continue to be, attracted to these areas because, in part, they provide climatic relief and a high degree of scenic quality. In addition to TSV, MA 16 includes two other alpine ski areas—Red River Ski Area and Sipapu Ski Area. In all of these ski areas, the majority of the lifts and/or the ski trails are on NFS lands and under permit.

Affected Environment

Skier/Rider Capacities

Comfortable carrying capacity (CCC) is defined as a level of utilization for a given resort that provides a pleasant recreational experience, without overburdening the resort infrastructure. Comfortable carrying capacity does not indicate a maximum level of daily skier/rider visits, but rather the number of skier/riders that can be "comfortably" accommodated at any one time. The accurate estimation of the CCC of a mountain is a complex issue and is the most important planning criterion for the resort. Related skier/rider service facilities, including base lodge seating, mountain restaurant requirements, restrooms, parking, and other guest services are planned around the proper identification of the mountain's CCC.

Comfortable carrying capacity is derived from the resort's supply of vertical transport (the vertical feet served combined with the uphill hourly capacities of the lifts) and demand for vertical transport (vertical demand equals the aggregate number of runs demanded multiplied by

[13] TSV, 2010

[14] TSV, 1981

[15] USDA Forest Service, 1986d

the vertical rise associated with those runs). The CCC is calculated by dividing vertical supply by vertical demand, and factors in the total amount of time spent in the lift waiting line, on the lift itself, and in the downhill descent. A detailed calculation of TSV's current CCC was completed for the 2010 MDP.[16] Taos Ski Valley's existing CCC is 3,520 skiers/riders at any one time.[17]

Note: It is not uncommon for resorts to experience peak days during which skier/rider visits exceed the CCC by as much as 25 percent. However, using CCC by which to plan a resort's infrastructure protects the quality of the recreational experience, and thus the resort's market appeal.

Annual Visitation

Taos Ski Valley

Taos Ski Valley averages 130 operational days per season. Going back over the last 2 decades (between 1990/91 and 2010/11), TSV's highest annual skier/rider visitation was 364,000 in 1994/95 (table 4). Since that time, TSV's annual skier/rider visitation has fluctuated, with a declining trend (figure 1). Taos Ski Valley has not exceeded 300,000 annual visits since the 1997/98 season, in which 300,264 total skiers were recorded. Table 4 provides information on TSV's annual skier/rider visitation between the 1990/91 and 2010/11 seasons.

Table 4. Annual Taos Ski Valley skier/rider visits from 1991 to 2011

	Season	Annual Skier/Rider Visits	Annual Snowfall (in.)
2000s	2010/11	193,796	168
	2009/10	256,879	280
	2008/09	241,115	167
	2007/08	219,002	306
	2006/07	208,187	199
	2005/06	158,003	152
	2004/05	237,441	277
	2003/04	224,565	204
	2002/03	249,682	252
	2001/02	201,113	151
	2000/01	248,852	321
	10-Year Average	*224,484*	*225*

[16] TSV, 2010

[17] According to TSV's SUP (p. 2): for planning purposes, a capacity for the ski area shall be established in the Master Development Plan and appropriate NEPA document.

Table 4. Annual Taos Ski Valley skier/rider visits from 1991 to 2011

	Season	Annual Skier/Rider Visits	Annual Snowfall (in.)
1990s	1999/00	173,031	164
	1998/99	282,884	217
	1997/98	300,264	337
	1996/97	271,862	373
	1995/96	223,300	182
	1994/95	364,000	374
	1993/94	355,020	389
	1992/93	314,485	337
	1991/92	355,000	249
	1990/91	308,000	289
	10-Year Average	*294,785*	*291*

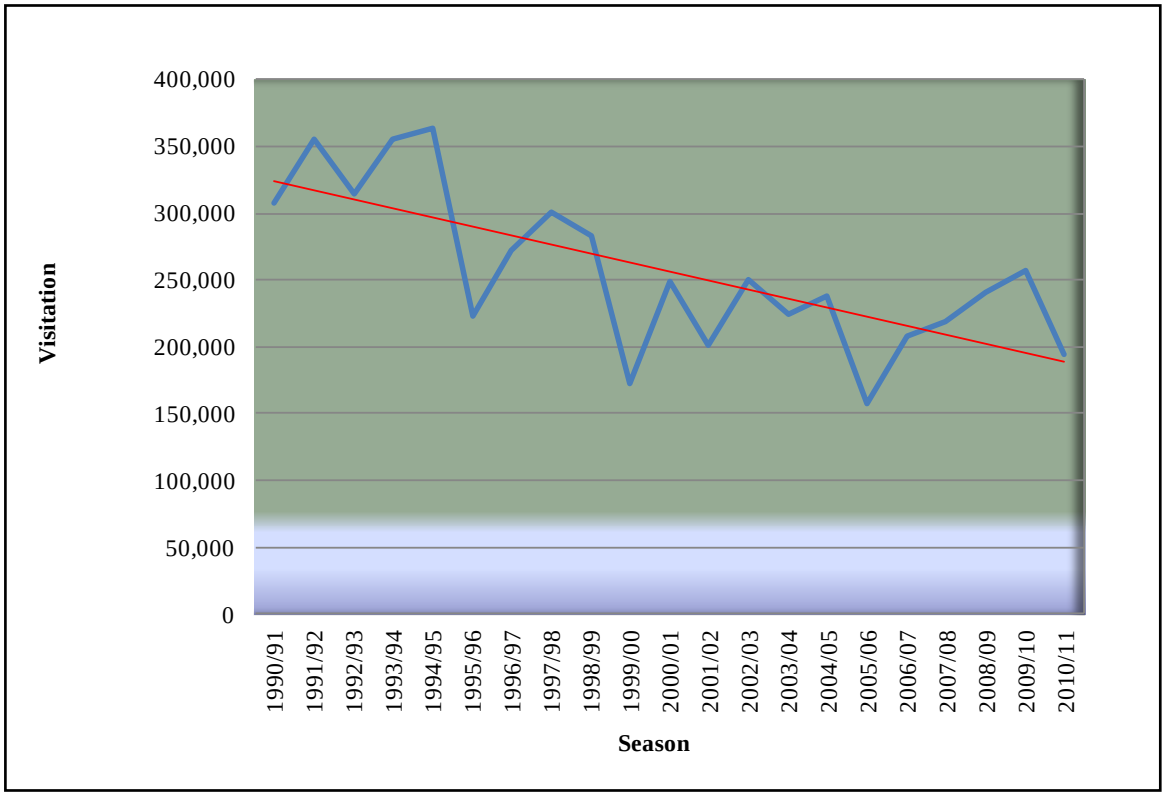


Figure 1. Annual Taos Ski Valley skier/rider visits from 1991 to 2011

Key observations in table 4 and figure 1 include:

- Through the 1990s, TSV averaged approximately 295,000 annual visits.
- By the 2000s, TSV's average annual skier/rider visits had dropped to approximately 225,000.
- Taos Ski Valley's 10-year average annual skier/rider visits dropped by approximately 25 percent between the 1990s the 2000s.
- In the 13 years since TSV last exceeded 300,000 annual visits (1997/98), TSV has averaged approximately 222,000 annual visits.

Although TSV has an advanced snowmaking system which provides coverage on key beginner and intermediate trails, the resort is highly dependent on natural snow to provide coverage across its remaining network of lift-served and hike-to terrain. As with any ski area, TSV is subject to vagaries in the weather that can affect snow conditions throughout the season (refer to table 4 for total annual snowfall at TSV). In short, total annual snowfall affects annual skier/rider visits at a ski area, and TSV is no exception.

For this recreation analysis, TSV's annual skier/rider visitation was compared to annual snowfall for the 21 seasons between 1990/91 and 2010/11. As indicated in table 4, in the 1990s TSV averaged 295,000 annual skiers/riders and 291 inches of snow. In the 2000s that average fell to 225,000 annual skiers/riders and 225 inches of snow. While a direct, year-by-year comparison does not yield a specific correlation between snowfall and annual visitation, when they are averaged across 2 decades, a strong correlation does emerge. This is part coincidence, and part reality. To a degree, snowfall affects visitation, but the fact that TSV made no major infrastructural or terrain improvements across this same timeframe must be taken into consideration at this point; i.e., in the absence of new terrain and/or infrastructure, snow quality became more important to TSV's clientele. In fact, the total guest experience at any ski area is defined by many factors, including, but not limited to, terrain variety, the lift network, dining and guest services, and snow quality. Beyond any one variable to the overall guest experience, long-term trends in annual visitation are defined by the overall value that guests perceive and the quality of the experience in general. Therefore, snowfall is important, but it is simply one factor that contributes to the overall guest experience at a resort and does not, in and of itself, dictate trends in long-term annual skier/rider visits. The importance of capital expenditures and terrain improvements is explored later in this section.

Until 2008, TSV was a skiers-only mountain. As snowboarding gained a larger foothold across the ski industry throughout the 1990s and into the 2000s, TSV was one of the few remaining "hold outs" in the United States which did not allow snowboarders. While it did appeal to a certain brand of skier, the resort could not continue to ignore the greater market (snowboarding currently represents 31 percent of skier visits nationwide, according to the National Ski Areas Association).[18] Therefore, on March 19, 2008, TSV reversed its long-standing ban on snowboarding, leaving only three resorts out of the nearly 500 operating in the United States closed to snowboarding (Mad River Glen in Vermont, Deer Valley and Alta in Utah). Taos Ski Valley's decision to allow snowboarders contributed to the increased visitation during the 2009/10 season; however, that was negated by poor snow conditions the following year, in which

[18] TSV, 2010

visitation declined. Based on daily counts since 2008, snowboarders represent 18 percent of TSV's market.

The majority (roughly 73 percent) of TSV's skiers and riders are destination guests who travel to the resort from across the Rocky Mountain region and nation, staying for multiple days. Of this majority, roughly 25 percent stay at TSV, 30 percent stay in the Town of Taos, and 18 percent stay elsewhere within Taos County. The remaining 27 percent of TSV's guests are day skiers and riders who reside in Taos or within driving distance to the resort from across the northern New Mexico region, including Santa Fe, Los Alamos, and Albuquerque.[19]

On busy weekends (e.g., the holidays/New Year, President's Day, Martin Luther King Day, and throughout spring break), TSV can experience peak days in which over 4,000 skiers/riders are in attendance. Although high, this number is well within 125 percent of TSV's CCC of 3,520.[20] Peak days are relatively rare, occurring 6 to 10 days per season. After the holidays, weekend days usually experience 2,000 skiers/riders, with 1,200 being typical on weekdays.

New Mexico

The overall declining trend in TSV's annual skier/rider visitation between 1991 and 2011 is reflective of the statewide trend for the same time period. In the 1990s, total New Mexico skier visits averaged 1,050,000 per year. In the 2000s, that average fell to 777,500 (a 26 percent decline).[21]

Rocky Mountain Region

In the Rocky Mountain Region as a whole (composed of Idaho, Montana, Wyoming, Utah, Colorado, and New Mexico), total skier visits were up by 2.6 percent in 2010/11 over the previous season, to 20,900,328. Generally, the region saw higher than average snowfall and a longer season, as well.[22]

United States

New Mexico's declining trend cannot be blamed entirely on the weak economy, since the ski industry overall saw record skier/rider visitation in the 2010/11 season with 60.54 million visits nationwide, slightly edging out the previous record of 60.5 million in 2007/08.[23] This can be attributed to modest improvement in the travel and tourism market, high average snowfall in all major regions except the Southeast and Southwest, and in turn, longer seasons. The record performance of the 2010/11 season demonstrates the resilience and positive momentum that the ski industry has maintained over the past decade.[24]

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[19] Information provided by TSV management.

[20] On an extremely infrequent basis, TSV has accommodated 4,500 people in a single day. While this results in longer lift lines, the lift and trail network (as well as parking and guest services) can handle these infrequent peak days.

[21] Includes Angel Fire, Parajito, Red River, Sipapu, Sandia Peak, Sante Fe, Ski Apache, and TSV. Ski New Mexico, 2011

[22] Very low snow associated with La Nina negatively impacted resorts in the southwestern United States, including New Mexico.

[23] NSAA, 2011

[24] Ibid.

At 60.54 million visits in 2010/11, the United States as a whole was up 13.5 percent from the long-term average (1978/79 to 2010/11) of 53.33 million visits. Over the last ten seasons, the average number of visits recorded nationally was 57.8 million visits, and the 2010/11 season was up 4.7 percent from this 10-year average. The industry has substantially "raised the bar" the past decade, with the ten best seasons on record all occurring in the past 11 winters (i.e., since 2000/01).[25]

Taos Ski Valley's Competitive Market

Taos Ski Valley shares a competitive market with other regional and destination resorts in the southern and central Rocky Mountains. This market includes not only similarly sized resorts in New Mexico, such as Angel Fire, Red River, Santa Fe, Parajito, Sandia Peak and Ski Apache, but extends to southern Colorado resorts such as Wolf Creek, Telluride, Crested Butte, and Durango. Additionally, TSV competes with ski areas that are known for their challenging terrain such as Jackson Hole, Alta, and Big Sky.

Industry Trends: Capital Expenditures and Terrain Improvements

Over the past 2 decades, the ski industry has witnessed a trend toward lift-serving high alpine terrain in response to growing customer demand. This trend has been fueled by evolutions in ski and snowboard technology, as well as skier/rider preferences for more adventurous and challenging terrain. In general, resorts that have successfully added high alpine lifts, while maintaining a healthy balance of hike-to terrain, have retained or in many cases increased, their market shares (i.e., annual skier/rider visitation).

At ski areas across the United States, capital expenditures are on the upswing, increasing from $242 million in 2009/10 to $293 million in 2010/11, with a projected rise to $369 million in 2011/12. The increases likely reflect improved resort outlooks on the economy and market conditions, and/or resort financial circumstances.[26]

In the context of its overall decline in annual skier/rider visitation across the late 1990s and the 2000s, TSV has not added any terrain or invested in significant capital improvements that would lead to an improved recreational experience.[27] In fact, aside from the addition of the *North American* trail/glade in 2008, the most recent capital improvements at TSV were from the 1981 MDP.[28] Lifts 1, 2, and 4 were replaced, and lifts 7, 7a, and 8 were installed in 1984, 1992 and 1995, respectively. In the midst of this, TSV has lost much of the brand recognition that it had in the 1970s and 1980s, as destination guests looked elsewhere to resorts that were investing in terrain and infrastructural improvements, as well as to resorts that allowed snowboarding, which was rising in popularity.

By contrast over the past decade, many resorts across the nation have increased their net skiable acreage and/or invested in capital improvements, which have contributed to the ski industry's ten best seasons on record, all occurring in the past 11 winters (table 5).

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[25] Ibid.

[26] Ibid.

[27] With the exception of Santa Fe and Angel Fire, this is generally true of all of New Mexico's ski resorts.

[28] TSV, 1981

Table 5. Annual U.S. skier/rider visits from 1991 to 2011

Season	Total U.S. Skier Visits (in millions)
2010/11	60.54
2009/10	59.79
2008/09	57.35
2007/08	60.50
2006/07	55.07
2005/06	58.90
2004/05	56.89
2003/04	57.07
2002/03	57.59
2001/02	54.41
2000/01	57.34
1999/00	52.20
1998/99	52.09
1997/98	54.12
1996/97	52.52
1995/96	53.98
1994/95	52.68
1993/94	54.64
1992/93	54.03
1991/92	50.84
1990/91	47.72

A correlation can be made between terrain expansions, capital improvements, and visitation growth. It is likely these types of investments lead to tangible improvements in guests' recreational experiences and help drive or, at least maintain, annual visitation levels.[29] Conversely, the absence of terrain and capital improvements may contribute to an erosion of market share. It is likely TSV's gradual decline in annual visitation and weakened competitive positioning are related to its lack of new terrain and capital improvements, when compared to other resorts in the Rocky Mountain Region, and to the U.S. ski industry as a whole.

As an example, through a variety of projects, many western resorts have managed to retain, improve, and even create their reputations within the "adventure" skiing and snowboarding market segment. Examples of some of these resorts (not all of which are direct competitors with TSV) include:

[29] External factors such as snowfall and economic factors must be considered, as well.

- Telluride, Colorado – Prospect Bowl and Revelation Bowl
- Breckenridge, Colorado – Imperial Express (Peak 8)
- Arapahoe Basin, Colorado – Montezuma Bowl Express
- Snowbird, Utah – Mineral Basin
- Big Sky, Montana – Lone Peak Tram
- Snowbasin, Utah – Strawberry Express Gondola
- Mt. Rose, Nevada – The Chutes terrain expansion

An examination of thirteen Colorado/New Mexico resorts between the mid-1990s and late-2000s completed for this EIS reveal those who invested in terrain and capital infrastructure reported *stable or increased* annual visitation.[30] Resorts that did not invest in terrain and capital infrastructure, including Crested Butte, Durango, and TSV, experienced substantial *decreases* in skier visits over the same time period.

To illustrate the effects of terrain and capital improvements on a resort's annual visitation, two recent ski area improvement projects at Mt. Rose Ski Tahoe (Nevada) and Arapahoe Basin (Colorado) were examined. Mt. Rose and Arapahoe Basin are used as examples because they are of similar size to TSV, and expert and intermediate terrain was incorporated into their lift-served terrain networks without significant terrain modification (i.e., grading and/or tree removal).

- In the 2004/05 season, Mt. Rose Ski Tahoe opened 167 acres of lift-served, expert terrain in "The Chutes" (this required an expansion of the ski area's SUP boundary). As a result of The Chutes project, Mt. Rose witnessed an increase of 54,000 annual skier visits (26 percent) between the 2003/04 and 2004/05 seasons. A comparison of the seven seasons prior to and since, indicates that Mt. Rose's sustained average annual visitation increased by 17 percent following the implementation of this project.
- In the 2007/08 season, Arapahoe Basin installed the Montezuma Lift, which provides direct lift service to 347 acres of new expert and intermediate terrain (Montezuma Bowl was within the ski area's SUP boundary). Following installation of the Montezuma Lift, Arapahoe Basin experienced an increase of 70,000 annual skier visits (19 percent) between the 2006/07 and 2007/08 seasons, following the installation of the Montezuma Lift. This increase in annual visitation has been sustained, with the exception of the 2009/10 season, which saw low snowfall.

Lift Network

Prior to approval of TSV's 1981 MDP, lifts 1, 2, 4, 5, and 6 constituted TSV's on-mountain lift network.[31] Following approval of the 1981 MDP, three of these lifts were replaced: Lift 1 in 1989; Lift 4 in 1991; and Lift 2 in 1995. In 1984 Lift 7 was installed, followed by Lift 7a in 1992 and Lift 8 in 1994. Lift 3 is TSV's oldest lift (42 years). Lift 2, replaced in 1995, is the most recent improvement to TSV's on-mountain lift network. The average age of TSV's aerial lifts is now 27 years.

[30] Including: Winter Park, Wolf Creek, Keystone, Copper Mountain, Telluride, Beaver Creek, Vail, Aspen, Breckenridge, Steamboat, Crested Butte, Durango and TSV.

[31] TSV, 1981

Taos Ski Valley currently operates 13 lifts: 4 quad (four-person) chairlifts, 1 triple (three-person) chairlift, 5 double (two-person) chairlifts, and 3 surface lifts. Taos Ski Valley's lifts are separated according to their location on the front side and back side. Taos Ski Valley has no high-speed, detachable chairlifts. The front side includes lifts 1, 2, 5, 6, and 8, as well as teaching lifts. These lifts serve approximately 200 acres of terrain.

Lifts 1 and 5 provide TSV's out-of-base lift capacity, although Lift 5 is rarely used. Technically, these lifts have a combined capacity of 3,300 people per hour (pph), but since Lift 5 is rarely used, the operational out-of-base capacity is 2,100 pph (i.e., associated with Lift 1).

In general, the age and low capacity of the resort's lift network is such that the 2010 MDP notes that it should be improved and expanded in order to better and more efficiently serve terrain throughout the SUP area.[32] From a recreational perspective, lift speed and hourly capacity are primary factors. Taos Ski Valley's existing network of slow, low capacity lifts restricts the number of runs skiers and riders are able to make throughout the day. Further, access to the summit is necessary to get to the back side, which requires riding two lifts in series. This situation makes circulation difficult and contributes to crowding and congestion at key locations during periods of high visitation.

Terrain Network

Lift-Served Terrain

Taos Ski Valley's terrain (lift-served and hike-to) is located on northeast through northwest facing slopes, topping out at 12,481 feet above sea level at the highest point along the ridge known by skiers as Kachina Peak. The base area sits in a valley at an elevation of approximately 9,200 feet. However, the highest lift-served terrain (from the top of Lift 2) is at 11,819 feet. Taos Ski Valley's lift-served terrain network is composed of "developed" and "undeveloped" terrain.

Taos Ski Valley has a longstanding reputation for low trail densities, diverse terrain, and quality snow conditions. As illustrated in the 2010 MDP, TSV's existing terrain distribution is closely matched to its particular market demand across the range of ability levels, with the exception of a noteworthy deficiency of advanced intermediate terrain and a surplus of expert level terrain.[33]

Taos Ski Valley's topography is composed of distinct areas represented by bowls, ridges, chutes, and trees. Because of the main aspects of these slopes, varied terrain features, and the roughly 3,000 feet of total vertical relief, a wind or storm from any direction can result in an avalanche hazard. Taos Ski Valley qualifies as a Class A Site: High Avalanche Hazard. The site has at least one high intermittent avalanche slide path of ten or more low intermittent avalanche areas. Many of the slopes at TSV have been reclassified as "low intermittent hazard" (indicates occasional exposure to avalanches or dangerous size), because of the protective measures that are routinely applied.

Taos Ski Valley uses multiple methods of conducting snow stabilization activities. A single 105 mm Howitzer provides extremely effective avalanche control for certain weather and terrain conditions. In addition, avalaunchers are used to reach inaccessible areas and expedite control

[32] TSV, 2010

[33] Ibid.

work done on skis.[34] Third, hand blasting may be used in conjunction with the Howitzer and Avalauncher to control avalanche paths. Finally, slope stability is tested by ski patrol staff.[35]

Developed Terrain

The "developed" or formalized terrain network at TSV consists of the lift-served, cleared trails at the resort. Developed trails represent the baseline of the terrain at any resort, as they are where the majority of guests ski and ride, and they are usually the only place to ski/ride during the early season, periods of poor or undesirable snow conditions, avalanche closures, and certain weather conditions.

Taos Ski Valley's developed trail network accommodates beginner- through expert-level guests on 80 lift-served named trails spanning approximately 346 acres. Most beginner and intermediate runs are groomed on a regular basis, totaling approximately 160 acres. However, TSV is known for its extensive and unique array of expert terrain, most of which is not included in the "developed" terrain network (discussed below).

Undeveloped Terrain

While it is renowned for steep, adventurous terrain and uncrowded slopes, it is TSV's abundance of "undeveloped" terrain that has defined its niche with the ski industry. Taos Ski Valley is unique, since the topography within the SUP area includes approximately 74 acres of natural steeps, chutes and glades that are almost entirely expert-level. These areas are lift-served, patrolled, and stabilized to avoid avalanches.

Glades are forested areas throughout a ski area, either natural or purposefully thinned, that provide varying levels of challenge, depending on the tree density and slope angle. Taos Ski Valley's glades are typically steep and tight, making them suitable for experts only. Examples of expert glades within TSV's developed terrain network include: *Sir Arnold Lund*, *North American*, *Edelweiss Glade*, and *Jean's Glade*. These glades are within the Lift 7 and Lift 1 pods. Depending on snow conditions, these notoriously steep glades are heavily used by expert skiers and riders. The 2010 MDP identifies other opportunities for glades which are well-spaced that would provide additional opportunities for expert skiers and riders.[36]

Lift 2 provides relatively easy access to roughly 1,050 vertical feet of double black diamond expert chutes and steeps.

Hike-To Terrain

Taos Ski Valley's unique offering of in-bounds, hike-to terrain represents a large part of its reputation for steeps and chutes. This reputation goes back to 1955, when TSV opened and people began hiking West Basin Ridge, Highline Ridge, and Kachina Peak. Hiking at TSV peaked in the

[34] The avalauncher is a compressed-gas-powered gun that fires explosive projectiles onto slopes too distant or dangerous for patrollers to approach on skis. Avalaunchers have a maximum range of approximately 2,000 meters. The trajectory is varied by altering the firing angle and the nitrogen pressure.

[35] "Test skiing" is a method of releasing tension in the snowpack on selected small slopes by traversing on skis; it serves as a field test of snow stability, and to check conclusions. "Protective skiing" is the deliberate, day-to-day disturbance of snow on avalanche slopes in order to encourage stabilization.

[36] TSV, 2010

1990s, and has remained relatively constant since that time. Currently, TSV offers 214 acres of hike-to terrain.

Although hike-to terrain is very popular among a specific segment of TSV's clientele, there is a surplus of hike-to terrain in comparison to its market. Taos Ski Valley has a roughly 2:1 ratio of lift-served to hike-to terrain (420 acres of lift served to 214 acres of hike-to) within its SUP area, which is comparatively high across the ski industry.

All of TSV's hike-to terrain begins with an initial, short (roughly 200 vertical feet) hike up the ridge from the top of Lift 2. Depending on conditions and one's level of fitness, the initial hike typically takes between 10 and 20 minutes. From the ridge, a multitude of different chutes, steeps, and bowls are available to the north and south, as described below. Hiking to the south leads to terrain along Highline Ridge and Kachina Peak, while hiking north leads to terrain along West Basin Ridge (map 1). These three areas represent some of the best in-bounds, expert terrain available at any ski area in the country. All of TSV's hike-to terrain is within its operational boundary, and is therefore subject to closures by ski patrol, based on snow safety and weather considerations. The ski patrol also maintains a presence throughout the hike-to terrain and responds to emergencies, as needed.

Taos Ski Valley estimates that on any given day, a maximum of about 20 percent of its guests engage in some form of hiking along West Basin Ridge or Highline Ridge, with considerably fewer (20 percent of all hikers) summiting Kachina Peak to descend *Main Street* or *Hunziker*. Most hikers do not go further south on Highline Ridge than *Cabin Chute*, as hiking beyond that point entails an approximate 800-vertical foot ascent to reach the summit of Kachina Peak.

To put this into perspective, on a typical weekend day with 2,000 skiers/riders at TSV, roughly 20 percent (or 400 people) would be expected to hike. Of those hikers, approximately 50 percent (200 people) would hike to terrain accessible from Highline Ridge, 30 percent to terrain accessible from West Basin Ridge, and 20 percent (80 people) would summit Kachina Peak. While it is relatively common for hikers to make repeated trips along Highline Ridge and West Basin Ridge; most people who summit Kachina Peak only do so once in a single day.

West Basin Ridge

If one chooses to hike north, West Basin Ridge has some of TSV's most extreme/steepest chutes and biggest rock bands. Hike-to terrain on West Basin Ridge totals approximately 54 acres. Local favorites, *Stauffenberg* and *Zdarsky*, do not require a long hike, while access to *Wonder Bowl*, *Godi Chute* and *Muse Bowl* requires more time and effort to reach. Typically, hiking terrain along West Basin Ridge is open all the way to *St. Bernard* or *Thunderbird*, with additional terrain open as warranted by snow conditions.

Highline Ridge

After hiking from the top of Lift 2, numerous chutes and glades are available along Highline Ridge to the south between *Hidalgo* and *Cabin Chute*, depending on how far one chooses to hike. Hike-to terrain on Highline Ridge totals approximately 83 acres. Once past *Cabin Chute*, a roughly 800-vertical foot ascent is required to reach the summit of Kachina Peak. Note that when Kachina Peak is not open, *Cabin Chute* represents the furthest extent south which one can hike.

Kachina Peak

Due to its high alpine and exposed nature, Kachina Peak is typically open 55 to 60 days each season (weather dependent). Kachina Peak is typically not open until after the New Year each season. Depending on weather conditions and one's fitness level, it takes a hiker approximately 60 to 90 minutes to reach terrain off the summit of Kachina Peak, along Highline Ridge from Lift 2. Once past *Cabin Chute*, as hikers ascend Kachina Peak, they can drop into *K1* through *K5*. From the summit, *Main Street* is the primary route down the center of the bowl, with *Hunziker* further to the east. Hike-to terrain off of Kachina Peak totals approximately 77 acres.

Snowmaking

The snowmaking system at TSV is capable of covering approximately 193 acres of beginner and intermediate terrain within the developed terrain network. The typical 11-week snowmaking season usually begins in late October and is finished by mid-January. An average depth of 18 to 24 inches is required to open most terrain. The snowmaking system draws water from the Rio Hondo and uses water guns, fan guns and tower guns to provide an appropriate depth of coverage across critical terrain.

Alternative Winter Activities

During the evening, TSV rents snowtubes to guests for sliding on the lower section of Strawberry Hill, adjacent to Lift 3. The tubing run is on a wide-open slope, starting on private land near the snowmaking pumphouse and running to the north across the Rio Hondo onto NFS land. Currently snowtubers walk up the hill and wait their turn to descend. Taos Ski Valley does not operate a lift to transport snowtubers, but the demand for this amenity is extremely high. Because Strawberry Hill is important teaching terrain, TSV does not create or maintain any permanent tubing lanes, nor can it offer sliding during the day. There is lighting in place at this time for the tubing facility. The Village at Taos Ski Valley has a dark skies ordinance with which TSV complies.

There are no formal trails within or immediately adjacent to the SUP area for snowshoeing or cross-country skiing in the winter. However, TSV recognizes that there is demand for both of these activities.

Summer Activities

Summer activities at TSV are limited to chairlift rides on Lift 1 (guests can either download back to the base area or walk back down on the TSV maintenance road) and special events, which are periodically held on NFS and private lands throughout the summer season, contingent upon necessary approvals. There are no summer hiking or biking trails on private or NFS lands at TSV.

Environmental Consequences

Alternative 1 – No Action

Skier/Rider Capacities

Under the no action alternative, TSV's CCC would remain at 3,520 guests per day.

Annual Visitation

Taos Ski Valley has not exceeded 300,000 annual visits since the 1997/98 season. Since that time, it has averaged approximately 222,000 annual visits. This is compared to a 10-year average of 295,000 annual visits in the 1990s, representing a 25 percent decline in visitation between the 2 decades.

As previously discussed, it is likely TSV's lack of terrain and capital improvements over the past 2 decades, combined with its slow embrace of the snowboarding market, directly contributed to its gradual decline in annual visitation throughout the 2000s. Under alternative 1, no terrain or capital improvements would be approved within TSV's SUP area. Therefore, it is likely that TSV's annual visitation would continue to hover around 225,000 in the short term, with further declines in the long term, as infrastructure continues to age and destination skiers/riders look elsewhere to resorts that have invested in projects that substantively improve their recreational offerings and experience. In the midst of this, extremely good or bad snow years could further affect annual skier/rider visitation

While the frequency of peak days would be expected to continue under alternative 1 (approximately 6 to 10 peak days per season), the magnitude of those peak days would be expected to decrease to below 4,000 guests-per-day as TSV's market share continues to erode. Typical weekdays and weekends would likewise be expected to decrease to below 2,000, and 1,200 guests-per-day, respectively.

Lift Network

The average age of TSV aerial lift network is 27 years. The 2010 MDP notes that, due to the age and low capacity of the resort's lift network, it should be improved and expanded in order to better and more efficiently serve terrain throughout the SUP area.[37]

No changes would occur to TSV's lift network under the no action alternative. Taos Ski Valley would continue to operate 13 lifts: 4 quad chairlifts, 1 triple chairlift, 5 double chairlifts, and 3 surface lifts. Taos Ski Valley's existing network of fixed-grip lifts would continue to restrict the number of runs that skiers and riders are able to make throughout the day, as well as contributing to crowding and congestion at key locations during peak periods. The long lift ride times would continue to affect the quality of the recreational experience at TSV.

As previously discussed under the "Visitation" section, lack of capital improvements such as lifts has, and would likely continue to, directly contribute to TSV's historic and future decline in annual visitation.

Alternative 1 would continue to operate only Lift 5 during the summer.

Terrain Network

No changes would occur to TSV's lift-served, developed terrain network (346 acres) under the no action alternative. Taos Ski Valley's terrain distribution would continue to be closely matched to its particular market demand across the range of ability levels, with a shortage of advanced intermediate terrain and an excess of expert terrain.

[37] Ibid.

Additionally, there would be no changes to the natural glades and chutes that are accessible from TSV's lift network. Taos Ski Valley's lift-served, undeveloped terrain would continue to total approximately 74 acres.

As previously discussed under the "Visitation" section, lack of lift-served terrain projects have, and would likely continue, to directly contribute to TSV's historic and future decline in annual visitation.

Hike-To Terrain

Under alternative 1, in-bounds, hike-to terrain would be maintained on West Basin Ridge, Highline Ridge, and Kachina Peak, totaling roughly 214 acres (33 percent) of TSV's terrain. Although hike-to terrain is very popular among a specific segment of TSV's clientele, TSV would continue to have a surplus of hike-to terrain compared to other ski areas in the region and throughout the industry. Selection of alternative 1 would not help sustain the resort in the future as the skiing/riding market continues to demand lift-served, expert terrain. However, because hike-to terrain is very popular among a specific segment of TSV's clientele, alternative 1 would satisfy those who appreciate the existing abundance of hike-to opportunities.

Alternative Winter Activities

Under alternative 1, the starting time at TSV to rent snowtubes to guests for tubing on the lower section of *Strawberry Hill* would continue to be after 5:00 pm. Based on TSV's experience renting tubes to guests for sliding on open slopes, the demand for more formalized, lift-served snowtubing would continue to go unmet, especially from the hours of 1:00 p.m. to 5:00 p.m.

There would be no developed trails within or immediately adjacent to the SUP area for snowshoeing or cross country skiing in the winter. Demand for these activities would continue to go unmet by TSV.

Summer Activities

Under alternative 1, summer activities at TSV would continue to be limited to chairlift rides on Lift 1, and guests would either download back to the base area, or walk down on the TSV maintenance road. Special events, which are held on NFS and private lands periodically throughout the summer season, would continue to be held contingent upon necessary approvals.

Alternative 2 – Proposed Action

Skier/Rider Capacities

Under alternative 2, TSV's CCC would increase from 3,520 to 4,200, a 19 percent increase over alternative 1. This is attributable to lift replacements and installations. Notably, the replacement of Lift 5 with a high speed, detachable quad would reduce the use of Lift 1 to rare occasions, while substantially increasing TSV's out-of-base lift capacity. Likewise, replacing Lift 4 with a high speed detachable quad would increase that lift's contribution to CCC. Alternative 2 includes replacing Lift 7 with a newer fixed-grip quad. Finally, installation of the Main Street and Ridge lifts would incrementally increase CCC, as they contribute (albeit only slightly) to TSV's uphill capacity.

Annual Visitation

The Upgrade Plan identified in the 2010 MDP is designed to improve the overall recreation experience at TSV.[38] As "Phase 1" of the 2010 MDP, alternative 2 projects would allow TSV to begin rebranding itself after almost 2 decades in which no substantial investments in terrain and infrastructure have been made. Thus, the intent (and potential effect) of alternative 2 is that TSV would recapture some of the destination skiers and riders that have been lost since the 1990s. This would make the resort more economically viable and would allow TSV to continue to offer its unique recreational experiences into the future. Additionally, the proposed infrastructure included in alternative 2 would lessen the contribution of snowfall to TSV's annual visitation (i.e., TSV cannot control the weather, but it can improve the recreational experience it offers by investing in infrastructure).

Based on recent lift/terrain projects at other western resorts (as discussed previously under Affected Environment) it is reasonable to assume that lift serving TSV's high elevation terrain would be accompanied by a short-term "spike" in annual visitation, followed by a long-term, more modest, sustained increase. Taking into consideration recent lift/terrain projects at other western resorts (explored in Affected Environment), a reasonable estimate is that new high alpine lifts proposed in alternative 2 could generate an initial spike of between 15 and 20 percent in annual skier/rider visits at TSV for the first 3-to-5 years. It is anticipated the majority of this spike would be attributable to installation of the proposed Main Street Lift; however, the ability of the Ridge Lift to generate additional visitation cannot be discounted. Other proposed mountain improvement projects that would be phased in over 2 to 7 years following approval (e.g., replacement of lifts 4, 5 and 7; new gladed areas; the Snowtubing Center, snowshoe trails, and the lift-served Mountain Bike Trail) would build on the excitement generated by the Main Street and Ridge lifts.

A conservative estimate is the long-term (7 years and beyond) effect of alternative 2 would an increase in annual visitation at TSV by an average of 10 to 15 percent.[39] This is independent and does not take into consideration the potential effects of extremely good or poor snow years, which (among other variables) can contribute to annual skier/rider visitation.

Therefore, the short-term spike in average annual visitation as a result of alternative 2 could increase from the current 225,000 to approximately 270,000 (or more). In the long-term, this would likely level out to between 250,000 and 260,000.

The frequency of peak days in excess of 4,000 skiers/riders (e.g., the holidays/New Year, President's Day, Martin Luther King Day, and throughout spring break) is not anticipated to increase as result of alternative 2. Six to ten peak days would still be expected through the season in the future. However, the number of skiers/riders in attendance on those peak days could be expected to increase slightly, particularly in the short term.

Therefore, the 10 to 15 percent increase in average annual visitation at TSV associated with alternative 2 would be attributable to higher attendance on weekdays and on typical weekends through the season. In other words, weekday attendance may increase from an average of 1,200 skiers/riders to 1,400 and weekend days may increase from 2,000 to 2,300.

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[38] Ibid.

[39] For reasonably foreseeable future projects with potential to increase annual visitation at TSV, refer to the cumulative effects section.

Lift Network

The lift replacements and installations proposed in alternative 2 are consistent with the 2010 MDP, which identifies the age and low capacity of TSV's lift network as an impediment and restricts the number of runs skiers/riders are able to make throughout the day.[40]

Currently, Lift 1, with a capacity of 2,100 pph, is the primary out-of-base lift and is supplemented by running Lift 5, with a capacity for 1,200 pph, on peak days, 6 to 10 days a season. Under alternative 2, TSV would upgrade Lift 5 to a high-speed, detachable quad and Lift 1 would become the backup lift (similar to Lift 5's current role) on peak days. The existing Lift 5 has a capacity of 1,200 pph. The proposed replacement lift would have a capacity of 2,400 pph. This would increase TSV's total out-of-base lift capacity from 3,300 to 4,500 pph. Because Lift 1 would only operate on peak days under alternative 1, TSV's operational day out-of-base capacity would change from 2,100 pph (existing primary out-of-base lift) to 2,400 pph (proposed primary out of base lift). Although the change in out-of-base capacity between alternatives 1 and 2 is only 300 pph, installing a high-speed, detachable quad in the base area would be a substantial improvement to the recreational experience at TSV, by reducing lift ride times as well as lift line wait times.

Replacing Lift 4 would improve the recreational experience at TSV by decreasing the lift ride time, as well as lift line wait times. This would ultimately increase the number of runs that guests can make on popular terrain in a given day.

Lift 7 is proposed to be upgraded to a fixed-grip quad, which would improve the reliability of the lift. Taos Ski Valley would likely replace Lift 7 with the infrastructure from Lift 4 once it is upgraded with high-speed technology. This would not change the hourly capacity of the lift.

The proposed Main Street and Ridge lifts would provide lift service to areas that are currently hike-to only. The recreational implications of these two lifts are discussed below under "Terrain Network."

Note: Under alternative 2, only the upgraded Lift 5 would be operated during the summer. The proposed Main Street and Ridge lifts would only be operated in the winter.

Terrain Network

Alternative 2 would not change TSV's lift-served "developed" terrain network. However, alternative 2 would increase TSV's network of lift-served, undeveloped terrain by 249 percent over alternative 1, from approximately 74 acres to 258 acres. All of the additions to TSV's terrain network would be within TSV's SUP area. Additions to TSV's lift-served, undeveloped terrain network would be a direct result of four proposed projects: (1) Main Street Lift; (2) Ridge Lift; (3) Minnesotas Glades; and (4) Wild West Glades.

Lift-Served Terrain

While lift serving Kachina Peak and West Basin Ridge would impact some of TSV's clientele, the lift-served component of alternative 2 represents a decision on the part of TSV's ownership that, it believes, would benefit a majority of its customers while making the ski area more competitive in the regional and national market. In basic terms, proposed lifts would improve access to large

[40] TSV, 2010

underutilized portions of TSV's terrain, thereby increasing the number of runs/vertical feet that guests can make in a single day. This could be achieved while still maintaining much of the hike-to terrain (on Highline Ridge) for which TSV is known (refer to Hike-To Terrain discussion, below). Main Street Lift is consistent with TSV's SUP, the 1986 Forest Plan (TSV's SUP is within Management Area 16–Recreation Sites, which are managed as areas of "concentrated recreation use") and the 2010 MDP.[41]

Note: Highline Ridge (from the top of Lift 2 to just past *Cabin Chute*) and West Basin Ridge (from the top of Lift 2 to *Sauza*) would remain hike-to, and therefore would not be incorporated into TSV's lift-served terrain network (refer to the "Hike-to Terrain" section below).

West Basin Ridge

With installation of the proposed Ridge Lift, approximately 65 percent (35 acres) of existing hike-to terrain on West Basin Ridge would be converted to lift-served terrain. However, the hiking route would remain the same, and skiers/riders would still be able to hike from the top of Lift 2, if they wished. Due to the location of the top terminal of the proposed Ridge Lift, the upper portions of popular hike-to trails such as *Spitfire*, *Stauffenberg*, and *Zdarsky* would remain hike-to under alternative 2. From approximately *Sauza*, north, all terrain on West Basin Ridge would become lift-served with the Ridge Lift.

Note: Since use of the forested area that would be the Wild West Glade is currently very limited, the provision of lift service in this area would not affect the existing hike-to acreage.

Kachina Peak

Under alternative 2, 77 acres of hike-to terrain on Kachina Peak (including *Hunziker*, *Main Street*, and the *K Chutes- K1* through *K5)* would become lift-served, undeveloped terrain. The top terminal of the proposed Main Street Lift would be located below the summit of Kachina Peak. To get to the ridgeline from the lift would require an approximate 5-minute hike from the top of the lift. The Main Street Lift would only be operated during the winter. Based on the previous estimation of hikers who ascend Kachina Peak on a typical weekend day during the ski season (approximately 4 percent of visitors), lift-serving Kachina Peak would affect the recreational experience of around 80 people on an average weekend day, compared with alternative 1.

Note: The hiking route from Highline Ridge to the summit of Kachina Peak would remain unchanged in alternative 2. Those who wish to continue to hike would be allowed to do so.

Due to the high alpine and exposed nature of Kachina Peak, it is typically open between 55 and 60 days each season. Depending on conditions, it usually opens after the New Year. Incorporating Kachina Peak into TSV's lift-served terrain network (i.e., installing a fixed-grip quad with a capacity of 1,200 pph) would be anticipated to increase the number of days throughout the typical season in which Kachina Peak is open.

As a "Class A" Avalanche Hazard Ski Area, TSV is characterized by an everyday need for avalanche control evaluation. Reducing the probability that snow slides will occur on a slope is a hazard evaluation that takes place daily. Lift-serving Kachina Peak would improve TSV's capacity to perform snow safety operations by requiring less time for patrollers to hike to perform on-site safety operations, such as deploying hand explosives, performing ski cutting, and

[41] Ibid.

protective skiing. Additionally, it is well-known throughout the ski industry that increased use of terrain leads to increased snow compaction and therefore a more consistent, consolidated snowpack. These improved management opportunities would be conducive to opening terrain on Kachina Peak earlier in the season, and would also result in less intermittent closures throughout the season. Taos Ski Valley management anticipates that, in most seasons, Kachina Peak could be open in time for the holidays and would remain open through the end of the season.

Undeveloped Terrain

Alternative 2 would increase lift-served glades within TSV's SUP area from roughly 72 acres to 144 acres. Both the proposed Minnesotas and Wild West glades would be thinned similar to the recently created *North American Glade*. Thinning would not occur evenly, instead trees and clumps of trees would be thinned to an average spacing of 20 to 60 feet, to create skiable openings between standing trees extending down the fall-line of the slope.[42]

The proposed Wild West Glades (approximately 32 acres) would be accessed from the proposed Ridge Lift. In order to round-trip them, a skier/rider would have to use Lift 8 to access the proposed Ridge Lift or hike the ridge. With the natural terrain gradients of this area, combined with a tree clearing prescription that is intended to create large, navigable openings, the Wild West Glades are intended to be enjoyable for a range of ability levels, including advanced intermediates and experts. Strategic tree removal, signage, and rope closures along the lower extent of the Wild West Glades would be incorporated to ensure skiers/riders connect to *Lower Stauffenberg*, instead of skiing northwest of and below Lift 8.

The proposed Minnesotas Glades (approximately 40 acres) would be accessible from the summit or from the Lift 7 trail pod, and would be suitable for expert skiers/riders. In order to round-trip the proposed Minnesotas Glades, a skier/rider would have to ride Lift 1 or 5, then Lift 2 or 6 to access the Lift 7 pod.

Hike-To Terrain

Under alternative 2, 48 percent—approximately 102 acres—would remain hike-to only. Hiking along the Kachina, Highline Ridge, and West Basin Ridge routes would still be welcome. Providing lift service to 52 percent of TSV's existing hike-to terrain would impact a contingent of TSV's clientele that places a high value on the existing hike-to only experience. Refer to maps 1 and 2 in appendix A to compare the differences in hike-to terrain between alternatives.

As discussed under the Affected Environment section, TSV estimates that on any given day, approximately 20 percent of its guests engage in some form of hiking along West Basin or Highline ridges, with considerably less (20 percent of all hikers) making the effort to summit Kachina Peak. Most hikers do not go further south on Highline Ridge than *Cabin Chute*. To quantify this, on a typical weekend day with roughly 2,000 skiers/riders at TSV, roughly 400 would be expected to hike along the West Basin and/or Highline ridges, and approximately 80 guests may summit Kachina Peak (conditions warranting). It is these people would potentially be negatively impacted by the proposed Main Street and Ridge lifts.

[42] Field surveys indicate a high mortality of subalpine fir among existing trees in the Minnesotas Glades area; therefore much of the necessary thinning could be accomplished without affecting live trees.

West Basin Ridge

Although a portion of existing terrain on West Basin Ridge would become lift-served, approximately 35 percent (18.8 acres) of the most popular terrain (between *Spitfire* and *Sauza*) would remain hike-to only. Therefore, the impacts to hike-to terrain would extend only to the 30 percent of TSV's hikers who hike north of *Sauza*, as that terrain would become lift-served.

Highline Ridge

Hike-to terrain accessed from Highline Ridge would be unaffected by the proposed installation of either the Main Street or Ridge lifts. Hike-to terrain on Highline Ridge would continue to total approximately 83 acres. The experience for approximately 200 hikers (on a typical weekend day) that presently take advantage of the terrain between *Hildago* and *Cabin Chute* would be unchanged, as access to these areas would continue to be hike-to only. Due to lift service on Kachina Peak and portions of West Basin Ridge, hiking on Highline Ridge may increase by those who want a hike-to only experience. It is reasonable to assume that some of the people who currently hike on Highline Ridge would rather ride new lifts to high-alpine terrain.

In order to preserve the hike-to experience along Highline Ridge, TSV would prohibit skiers and riders who utilize the Main Street Lift from descending the ridge further to the north than *K1*. Because this ridge is typically wind scoured and does not present skiable conditions, this likely would not pose a management issue. However, as necessary, TSV would limit this through a combination of signage, ropes, and fencing. Doing so would maintain the hike-to experience along Highline Ridge and popular terrain on the Ridge's southern extent, including, but not limited to, *Cabin Chute*, *Cabin Trescow*, *Ninos Heroes*, *Lift Shack Chute* and *Twin Trees Chute*.

Kachina Peak

Although the terrain accessed from Kachina Peak would be lift-served under alternative 2, hikers would continue to be allowed to hike along the current route. For the approximately 80 people per weekend day that presently summit Kachina Peak, the experience would change primarily due to an increased volume of skiers descending *Main Street* and *Hunziker*, with associated changes in snow conditions. Skiers/riders that choose to continue to hike the ridge up to the summit would find the hike itself largely unchanged. The proposed Main Street Lift would not be visible for a majority of the hiking route (until they approach the summit); however, lift-served access to Kachina Peak would change the overall experience for those people who currently value the hike-to environment.

Snowmaking

The only proposed snowmaking change associated with alternative 2 is in the base area. To support adequate coverage of the proposed snowtubing lanes, TSV would extend existing snowmaking lines on its private land from Lift 3. Taos Ski Valley presently holds sufficient water rights for this project. This infrastructure would provide snowmaking coverage on approximately 1.5 acres of terrain (0.8 acre on private lands, 0.7 acre on NFS lands), which would utilize an additional 4 acre feet (roughly 1.3 million gallons) of water each season. Since snowmaking lines would be installed on private land only, alternative 2 would not change the existing snowmaking system on NFS lands.

Alternative Winter Activities

Alternative 2 includes two proposed projects that are designed to broaden the winter recreational opportunities at TSV throughout the season. They are the Snowtubing Center and a developed snowshoeing trail system (Adventure Center).

As proposed, the Snowtubing Center near Lift 3 would be situated roughly half on NFS lands within TSV's SUP area and half on private lands owned by TSV. Three to four prepared tubing lanes, varying from 250 to 280 feet long, would be served by a conveyor lift approximately 250 feet in length. This would offer a substantial improvement over the less formalized tubing which is presently offered on Strawberry Hill, and is conducted on wide-open slopes with no surface lift to transport tubers back to the top. Dedicated snowtubing facilities are becoming quite common at resorts across the nation, appealing to families and people seeking alternative activities throughout their day.

Approximately 2 miles in length, the planned Adventure Center, an interpretive snowshoe trail system, would be a low-impact (no trees would need to be removed and no ground disturbance would be necessary) supplemental winter activity at TSV. This trail would begin near the Little Maintenance Facility in the northeast portion of the existing SUP area. Due to the over-the-snow nature of this trail, TSV would have the opportunity to continually modify the marked trail throughout the season, as necessary.

Summer Activities

Offering a lift-served intermediate ability level Mountain Bike Trail from the top of lifts 1 and 5 would provide a summer activity that is currently not available at TSV. After riding Lift 1, riders could access the 3.6-mile trail near the top terminal. The Mountain Bike Trail would switch back down *White Feather* and then make its way through the tree island to *Porcupine*. Once on the front side, the trail would wind back and forth from *Al's Run* through *Inferno* to *Porcupine* to midway down the mountain, where it crosses over to *North American* and surrounding tree islands before returning to the base area. The trail would utilize the natural topography and tree openings to the greatest extent practicable, minimizing impacts and offering an exciting downhill mountain biking experience that TSV currently does not provide. The trail would be cut using hand crews, as well as a small (Swaco) excavator. This trail would complement existing lift-served sightseeing and hiking that is currently available from the top of Lift 1, and responds to a growing trend at resorts for offering alternative summertime activities.

Special events, which are held on NFS and private lands periodically throughout the summer season, would continue to be offered contingent upon necessary approvals.

Alternative 3

From a recreational perspective, alternative 3 closely resembles alternative 1. Specific differences between alternatives 1 and 3 are identified below.

Skier/Rider Capacities

Under alternative 3, TSV's CCC would increase from 3,520 to 3,730, a six percent increase over alternative 1. This is attributable to three lift replacements (notably, lifts 4 and 5) with high-speed

detachable quad chairlifts. Lift 7 would be upgraded with new fixed-grip technology, but this would not increase the capacity of the lift.

Annual Visitation

Alternative 3 does not include the types of projects that would be anticipated to increase annual visitation at TSV in a meaningful or quantifiable way. Replacement of lifts 4, 5, and 7 are likely not enough, in and of themselves, to stimulate additional visitation at TSV because these are necessary upgrades to infrastructure that is already in place. Added amenities such as interpretive snowshoe trails and lift-served mountain biking are important to rounding out the recreational experience at TSV, but are not the types of projects that induce additional visitation without more substantial new projects that serve as a foundation for generating new interest and excitement.

Annual visitation under alternative 3 would be expected to closely resemble alternative 1. Visitation would continue to hover around 225,000 in the short term, with probable further decline in the long term, as TSV's competitive edge in the ski industry continues to decline. Destination skiers/riders would be expected to look elsewhere to resorts that have invested in projects that substantively improve their recreational offerings and the quality or the experience.

As with alternative 1, the frequency of peak days would be expected to continue under alternative 3 (approximately 6 to 10 peak days per season). However, the magnitude of those peak days would be expected to decrease, as TSV's market share continues to erode. Typical weekdays and weekends would likewise be expected to decrease to below 2,000, and 1,200 skiers/riders, respectively.

Alternative 3 fails to truly respond to the purpose and need for action described in chapter 1. The foundation of which is to focus on meeting guests' demands and expectations, so TSV can remain economically viable into the future.

Lift Network

Alternative 3 includes upgrading lifts 4, 5, and 7. Both Lift 4 and Lift 5 would be replaced with high-speed technology. Lift 7 would be replaced with newer fixed-grip technology. These proposed projects are consistent with the 2010 MDP, which identifies the age and low capacity of TSV's lift network as an impediment that restricts the number of runs skiers and riders are able to make throughout the day.[43]

Replacing Lift 5 with a high-speed, detachable quad would increase TSV's average day (when only Lift 5 is running) out-of-base lift capacity from 300 pph to 2,400 pph, and peak day (when both lifts 1 and 5 are running) out-of-base lift capacity from 3,300 pph to 4,500 pph. Although the change in out-of-base capacity between alternative 1 and alternative 3 is only 300 pph, installing a high-speed, detachable lift in the base area would be a substantial improvement to the recreational experience at TSV, by reducing lift ride times, as well as lift line wait times.

Replacing Lift 4 with detachable technology would improve the recreational experience at TSV by decreasing the lift ride times as well as lift line wait times, ultimately increasing the number of runs that guests can make on popular terrain in a given day.

[43] TSV, 2010

Lift 7 is proposed to be upgraded to a fixed-grip quad (using the current infrastructure from Lift 4).

As with the alternative 2, only Lift 5 (upgraded) would be operated during the summer.

Terrain Network

Alternative 3 would not change TSV's lift-served "developed" terrain network. However, under alternative 3, lift-served, undeveloped terrain would increase by 40 acres (from 74 to 114 acres). This is attributable to the proposed Minnesotas Glades, which would be suitable to expert skiers/riders. The Minnesotas Glades would be accessible from the summit or from the Lift 7 trail pod. However, in order to round-trip ski/ride the proposed Minnesotas Glades, one would have to ride either Lift 1 or 5, then Lift 2 or 6 to access the Lift 7 pod.

The proposed Minnesotas Glades would be developed similar to the recently created *North American Glades*, with approximately 50 percent of the trees removed to offer a suitable recreational experience.

Hike-To Terrain

Alternative 3 would increase the number of acres of hike-to terrain by 16 percent over alternative 1, attributable to the proposed Wild West Glades (approximately 32 acres). As discussed under the Affected Environment section, TSV's unique offering of in-bounds, hike-to terrain represents an important part of its reputation. While hike-to terrain is very popular among a specific segment of TSV's clientele (approximately 20 percent of visitors hike), a general surplus of hike-to terrain has been identified in comparison to TSV's skier/rider market. Ultimately, TSV's ratio of terrain types would increase to 38 percent hike-to and 62 percent lift-served, increasing the existing surplus of hike-to terrain and further reducing its ability to appropriately service its current non-hiking demand.

With the natural terrain gradients of this area, combined with a tree clearing prescription that is intended to create large, navigable openings, the Wild West Glades are intended to be enjoyable for a range of ability levels, including advanced intermediates and experts. Strategic tree removal, signage, and possible rope closures along the lower extent of the Wild West Glades would be incorporated to ensure that skiers/riders connect to *Lower Stauffenberg*, instead of skiing northwest of and below Lift 8.

Alternative Winter Activities

Alternative 3 includes an interpretive snowshoe trail system (Adventure Center) designed to broaden the winter recreational opportunities at TSV throughout the season. Approximately 2 miles in length, the planned Adventure Center would be a low-impact (no trees would need to be removed and no ground disturbance would be necessary) supplemental winter activity at TSV. This trail would begin near the Little Maintenance Facility in the northeast portion of the existing SUP area. Due to the over-the-snow nature of this trail, TSV could continually modify the marked trail throughout the season, as necessary.

Summer Activities

Offering a lift-served intermediate ability level Mountain Bike Trail from the top of lifts 1 and 5 would provide a summer activity that is currently not available at TSV. After riding Lift 1, riders could access the 3.6-mile trail near the top terminal. As discussed under alternative 2, the Mountain Bike Trail would switch back down *White Feather* and then make its way through the tree island to *Porcupine*. Once on the front side, the trail would wind back and forth from *Al's Run* through *Inferno* to *Porcupine* until midway down the mountain, where it crosses over to *North American* and surrounding tree islands before returning to the base area. The trail would utilize the natural topography and tree openings to the greatest extent practicable, minimizing impacts and offering an exciting downhill mountain biking experience that TSV currently does not provide. The trail would be cut using hand crews, as well as a small (Swaco) excavator. This trail would complement existing lift-served sightseeing and hiking that is currently available from the top of Lift 1, and responds to a growing trend at resorts for offering alternative summertime activities.

Special events, which are held on NFS and private lands periodically throughout the summer season, would continue to be offered contingent upon necessary approvals.

Summary

Table 6 provides a comparison of the alternatives and their effects on recreation.

Table 6. Comparison of alternatives relative to recreation indicators

	Alternative 1	Alternative 2	Alternative 3
Skier/rider capacity (CCC)	3,520	4,200	3,730
Anticipated annual skier/rider visitation	225,000 (expect decline over time)	270,000	225,000 (expect decline over time)
Anticipated number of peak days throughout each season (125% of CCC)	6 to 10	6 to 10	6 to 10
Total lift network (lift types)	13 total: 4 fixed-grip quads, 1 fixed-grip triple, 5 fixed-grip doubles, 3 surface	15 total: 2 detachable quads, 4 fixed-grip quads, 3 fixed-grip triples, 3 fixed-grip doubles, 3 surface	13 total: 2 detachable quads, 3 fixed-grip quads, 5 fixed-grip doubles, 3 surface
Lift replacements	None	Lifts 4, 5, and 7	Lifts 4, 5, and 7
Lift-served developed terrain (acres)	346	346	346
Lift-served undeveloped terrain (acres)	74	209	114
Hike-to terrain (acres)	214	102	246

Table 6. Comparison of alternatives relative to recreation indicators

	Alternative 1	Alternative 2	Alternative 3
Alternative winter activities	Snowtubing after 5:00 p.m.	Snowtubing all day and evening, Snowshoeing	Snowtubing after 5:00 p.m., Snowshoeing
Summer activities	Chairlift rides on Lift 1	Chairlift rides on Lift 1 Mountain biking	Chairlift rides on Lift 1 Mountain biking

Cumulative Effects

Taos Ski Valley Past Development

Since its development in 1955 (with one lift and one trail), TSV has offered a distinctive, developed winter recreation experience on the Carson National Forest. Six decades later, TSV now offers 13 lifts, 420 acres of lift-served terrain, and 214 acres of hike-to terrain, providing skiing and riding opportunities for every ability level, from novice to extreme. Although TSV has a reputation as a small resort, it is situated in prime natural ski topography and in the 1990s consistently competed with larger resorts for visitors looking for a quality recreational experience with a variety of terrain. Despite the downward trend in visitor numbers through the 2000s, TSV strives to offer a quality recreational experience within its Forest Service-issued special use permit.

As discussed previously, aside from the addition of the *North American* trail and glade in 2008, the most recent capital improvements at TSV were from the 1981 MDP (lifts 1, 2, and 4 were replaced, and lifts 7, 7a, and 8 were installed in 1984, 1992, and 1995, respectively).[44]

From a recreational perspective, one of the most critical recent actions that has helped solidify TSV's place in the ski industry was its reversal in 2008 of a long-standing ban on snowboarding. Taos Ski Valley's decision to allow snowboarders has broadened its appeal in the Rocky Mountain Region and snowboarders now make up 18 percent of TSV's market.

Taos Ski Valley 2010 Master Development Plan

Taos Ski Valley's 2010 MDP identifies existing limitations and opportunities across the resort that would allow TSV to continue meeting visitor demand for a quality recreational experience.[45] By doing so, TSV could increase annual visitation and thereby reestablish its economic viability in the competitive ski industry. The majority of the projects identified in the 2010 MDP are currently undergoing site-specific NEPA analysis in alternative 2 of this Draft EIS. However, the 2010 MDP identifies other long-term projects throughout the SUP area that are designed to further improve the overall recreational experience at TSV. All of these future 2010 MDP projects would require site-specific NEPA analysis and subsequent Forest Service approval before they could be implemented. These projects are discussed below and detailed in appendix A.

[44] TSV, 1981

[45] TSV, 2010

New/replaced snowmaking infrastructure would allow TSV to provide more coverage (approximately 9 acres) as well as to increase inefficiencies. Aside from the lift replacements/additions contained in Phase 1 of the 2010 MDP (analyzed in alternative 2), a new teaching lift is planned on private lands in the base area, and a new base-to-summit lift (the Summit Lift) is planned on NFS lands. Although likely in the distant future, the roughly 7,000-foot long Summit Lift would provide expedited access to the top of the mountain, as well as almost 2,400 vertical feet of round-trip skiing and riding. The Summit Lift could potentially open up new opportunities for summer activities such as hiking and mountain biking (based on the success of the Phase 1 Mountain Bike Trail between the top of Lift 1 and the base area, others may be constructed throughout the SUP area). However, any additional summertime lift access and associated recreational activities would need to be considered relative to the Taos Pueblo's concerns over encroachment onto adjacent Tribal lands.

Future grading and trail widening projects on select trails throughout the SUP are designed to, among other things, improve skier/rider circulation; eliminate steep, abrupt pitches; improve access to trails; and aid in early season snowmaking operations. Finally, the 2010 MDP addresses TSV's deficiency of on-mountain service space with a new Mountain Top Restaurant at the top of Lift 2. This facility would be sized at between approximately 6,700 and 8,500 square feet.

Taos Ski Valley Summer Operations Plan

Taos Ski Valley's Summer Operations Plan is updated annually (as required by the SUP), in coordination with the Questa Ranger District. The purpose of the plan is to establish an operation and maintenance agreement between TSV and the Carson NF for the ski area to effectively operate their facilities for specifically authorized activities.

Taos Ski Valley operates Lift 1 in the summer to improve use and access to the resort year-round. Summer use of Lift 1 is a popular experience on the Carson NF, and enables lift-served hiking back down the maintenance road. Other summer operations at the resort include ongoing maintenance of resort infrastructure for safety and to maintain TSV's ability to offer a quality recreation experience.

Carson National Forest Questa Ranger District Travel Management Plan

The Carson NF Questa Ranger District Travel Management Plan (herein referred to as the TM Plan) manages motorized trails and roads across approximately 84,000 acres of the Carson NF. In the TSV area, the forest has decided to remove an existing corridor along Highway 150, where motor vehicle use was allowed up to 100 feet of the highway for the purpose of parking, camping, and fuelwood gathering. Since there are very few places where motor vehicles could go off the road (except in existing developed campgrounds) and there is camping available in the developed campgrounds along Highway 150 and in the vicinity of the Village of Taos Ski Valley, the decision to remove the 100-foot corridor would not affect the recreational car-camping opportunities in Rio Hondo Canyon. Together camping and skiing are some of the most popular opportunities on the Carson NF.

Development within the Village of Taos Ski Valley and Pattison Trust Land

Private land development in the Village of Taos Ski Valley and on Pattison Trust lands has added roads and residential and commercial infrastructure in a primarily natural setting. This

development has reduced the land available for recreation in the immediate area of TSV; however it does offer amenities that can be enjoyed by visitors. Because the Village is surrounded by the ski area, wilderness, and other undeveloped forested lands, where visitors can choose to recreate, private land development has contributed to the visitor experience, by offering guided tours, biking, dining, and lodging. It is anticipated the Village would continue to grow in the future; however, there are no specific proposals at this time that can be defined or analyzed.

Future development may be limited by the Village wastewater treatment facility, which is currently on NFS lands and under SUP with the Village of Taos Ski Valley. Under the Townsite Act, the Village submitted a proposal (summer 2010) to acquire approximately 70 acres of NFS lands, including the wastewater treatment site and the parking lots (currently under SUP with Taos Ski Valley). The Forest Service has not made any decision related to this proposal.

In summary, past and present projects in the vicinity of TSV have cumulatively created a well-rounded recreational experience on the Carson NF and contributed to the experience for which TSV is known for today. Future projects and plans are directed toward improving that experience, as well as drawing more visitors into the area. When these plans are considered in conjunction with approval of alternative 1 or alternative 3, it is likely that based on the current decline in visitors to TSV, as well as other New Mexico resorts, the recreation experience would remain similar to the one offered today. As a result, TSV would continue to see a decline in visitation. When alternative 2 is considered, in addition to what is currently (and potentially) offered in the TSV area, the recreational experience would be improved in a way that would likely improve TSV's competitive position in the Rocky Mountain skier market, drawing more visitors by significantly improving the recreation experience.

Irreversible and Irretrievable Commitment of Resources

Although terrain that is currently hike-to would be converted to lift-served skiing under alternative 2, hiking to this terrain would still be an option; therefore this would not represent an irretrievable commitment of the hike-to recreation resource. Additionally, the vegetation and ground disturbance that would result from lift installation and snowtubing construction could be revegetated and reclaimed; therefore alternative 2 would not result in an irreversible commitment of resources. Other projects such as lift replacements, glading, the Mountain Bike Trail, and snowshoeing trails would not represent an irreversible or irretrievable commitment of resources.

Social and Economic Environment

The social and economic resources analysis area is defined in the context of the northern New Mexico region, focusing on its relationship to the Carson National Forest (NF), Taos County, the Town of Taos, and the Village of Taos Ski Valley. Relevant social and economic data (including housing, population, and demographic trends) are provided and summarized to offer an analysis of the current and future socioeconomic makeup of the project area relevant to TSV's current and future operations. Integral to this analysis are two documents prepared for the USDA Forest Service:

- Values, Attitudes and Beliefs Toward National Forest System Land: The Carson National Forest (2006)[46]
- Socioeconomic Assessment of the Carson National Forest (2007)[47]

Affected Environment

Social Environment

The following overview of the social environment of New Mexico is excerpted from *Values, Attitudes and Beliefs Toward National Forest System Land: The Carson National Forest*.

> *"Northern New Mexico is a multi-cultural social environment with Hispanic, Native American, Anglo, as well as other cultural groups living in population centers and rural areas. This multi-cultural environment is expressed in New Mexico's history. The Sandia, Folsom, and Clovis Paleo-Indians had a presence in the southwest starting more than 10,000 years ago; and, the Chocise, Mogolloan, and Anasazi cultures also developed in this area of the southwest. The contemporary Apache, Hopi, Navajo, as well as more than 19 Pueblo Native American groups are the decedents of these aboriginal inhabitants.*
>
> *In about 1540 Francisco Vasquez de Coronado explored the Rio Grande Valley in search of the Seven Cities of Cibola. He was initially guided by the Franciscan Friar Marcos de Niza who first heard of Cibola in his 1539 explorations north from Mexico into what is now New Mexico. Don Juan De Oñate led some of the first Spanish settlers to the region where they established residence in the Rio Grande Valley in the early 1600s. Spanish settlement of this region continued through the 1700s, despite various conflicts with the Pueblo and other Native Americans, including an important Pueblo revolt in 1680. After about 1700, the Spanish used land grants to encourage settlement of this region. These grants were of various types, including some "community grants" that allowed grazing, firewood gathering, and other uses by community members. After Mexico achieved independence from Spain in 1821, this portion of Spanish territory was ceded to Mexico. Subsequently, the U.S.-Mexican War and the 1848 Treaty of Guadalupe Hidalgo resulted in American control of this region.*

[46] Russell and Adams-Russell, 2006

[47] USDA Forest Service, 2007

> *This social history shows a mix of cultures that have a contemporary presence in the counties and communities surrounding the Carson NF. It suggests a diversity of values and beliefs about natural resources and their use.'*[48]

The contemporary social environment of the northern New Mexico region is a mix of diverse communities ranging from small rural towns such as Red River, El Rito, and Questa to larger rural centers such as Taos and Espanola. Hispaño and Indian cultures are ubiquitous in these communities, although there is strong Anglo presence.[49]

Native American Tribes

New Mexico has a rich cultural history from and deep relationship with Native American people. Twenty-two federally-recognized tribes exist in New Mexico, including 19 Pueblos, the Mescalero, the Jicarilla Apache, and the Navajo Nation. There are approximately 2.8 million acres of Indian lands in the five counties that compose the Carson NF, with the majority in San Juan County. Rio Arriba County has 646,932 acres of Indian Lands (Jicarilla Apache) followed by Taos County (62,228 acres).[50]

Tribal lands account for approximately 20 percent of all lands in the State of New Mexico, frequently joining National Forest System (NFS) lands. National Forest System lands are important to the culture, traditions, and livelihoods of tribal peoples.

The Taos Pueblo is located approximately 20 miles by vehicle from TSV, and is the only living Native American community designated both a World Heritage Site by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and a National Historic Landmark.[51] The multi-storied adobe buildings have been continuously inhabited for over 1,000 years, and are considered to be the oldest continuously inhabited community in the country. There are approximately 150 full-time residents of the Pueblo, and an additional 1,900 Taos Indians living on Taos Pueblo lands in the vicinity. Their lands total approximately 99,000 acres, all in Taos County.

Taos Ski Valley (both private and NFS lands) occupies land that is considered important to Taos Pueblo.[52] Members have concerns regarding future expansion of the ski area affecting lands of cultural significance. Most of the Pueblo's concern is focused on trespass of sacred lands during the summer months. The Carson NF and TSV representatives regularly meet with officials from the Taos Pueblo. Taos Ski Valley officials met with the Pueblo government to share the 2010 Master Development Plan (MDP) and to understand tribal concerns regarding the ski area's current and future activities and operations. The Cultural Resources section includes a discussion on Taos Pueblo's concerns related to trespass on tribal lands.

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[48] Russell and Adams-Russell, 2006. p. 13

[49] Ibid. p. 1

[50] Ibid. p. 7

[51] Taos Pueblo, 2011

[52] Russell and Adams-Russell, 2006

Population, Housing and Income

The local and regional population and housing availability are key considerations in ski resort operations. Local and regional residents provide the source of potential local users of the resort, as well as the number of people available to work at the resort. The housing stock has an impact on affordability and availability of housing for all citizens in the community, including resort and non-resort employees.

Carson National Forest

Portions of the Carson NF are located within Colfax, Mora, Rio Arriba, and Taos counties. Population centers in this region include Espanola (population roughly 9,758), Chama (population roughly 1,175), Taos (population roughly 5,700), Questa (population roughly 1,927), and Raton (population roughly 7,186). Santa Fe (population roughly 68,650) is not immediately adjacent to the Carson NF, but this is a major population center in this region of New Mexico that provides users for the Carson NF, as well as other New Mexico national forests. Similarly, Albuquerque (population roughly 528,497) in Bernalillo County is also a regional population center.[53]

Average per capita income in the four counties that compose the Carson NF is $21,045, about two-thirds the statewide average, but well above average for most rural areas in New Mexico. Rio Arriba and Taos County are among the wealthiest in New Mexico, with pockets of relative wealth scattered among mainly rural, low and middle income communities. Colfax County, though smaller than Taos and Rio Arriba County, has the highest per capita income of the region, at $22,496. Mora County, by contrast, is the poorest county in the region and among the poorer counties in the state, with a per capita income of only $15,867.[54]

Taos County

In 2000, Taos County had a population of 29,979. In 2010, the population had risen by 9.9 percent to 32,937. The average per capita income between 2005 and 2009 was $21,720, and the median household income in 2009 was $31,660. In 2009, 19.7 percent of the population was below the poverty level ($18,530 – average annual family income).

Taos County housing is more affordable than most other ski resort communities. With a diverse, year-round tourism economy, a high percentage of day visitors, few vacation properties, and large workforce, Taos County's cost of living remains attainable. The median home value of owner-occupied housing units in Taos County between 2005 and 2009 was $204,100. Approximately 74 percent of the residents own their home.[55]

As of October 2011, Taos County had a labor force of 16,682 workers with 15,333 employed and 1,349 unemployed persons. This gives the county an estimated unemployment rate of 8.1 percent. The county unemployment rate is higher than the state at 6.6 percent and lower than the national average of 8.6 percent.[56]

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[53] Ibid. p. 5

[54] USDA Forest Service, 2007 p.79

[55] U.S. Census Bureau, 2010a

[56] U.S. Bureau of Labor Statistics. Last updated: Dec. 12, 2011

Town of Taos

In 2000, the population of the Town of Taos was 4,700 people. In 2010, the population of the Town had risen by 21.6 percent to 5,716. About 5,000 people live year-round in the Town of Taos.[57]

As of 2010, the Town of Taos had a labor force of 2,818 workers with 2,434 employed and 384 unemployed persons. This gives the town an estimated unemployment rate of 13.6 percent. The town unemployment rate is even higher than the county rate, which was far greater than both the state and national averages.[58]

Village of Taos Ski Valley

According to the 2010 Census, there are 57 year-round residents in the Village of Taos Ski Valley, just over a 3 percent increase in population since 2000. The average per capita income in 2009 was $59,219 with a median household income of $91,609, nearly three times the median household income of the Taos County population. The estimated median house or condo value in 2009 was $252,415.[59] Unemployment data for the Village of Taos Ski Valley is currently unavailable and is unlikely to become available in the future due to the very small size of the municipality. Due to the Village of Taos Ski Valley's small year-round population and relative affluence (compared to Taos County), it is unlikely that unemployment is an issue.

Economic Environment

Carson National Forest

The Carson NF occupies approximately 1.4 million acres of land in northern New Mexico. The Carson NF is one of five national forests in New Mexico and it ranks 9th in total acreage among the 12 national forests in the Southwestern Region (Region 3) of the National Forest System.

The Carson NF supports economic activity from a variety of uses, each of which affects the surrounding region in a number of ways. The Carson NF lies mainly within Taos and Rio Arriba counties, with small portions in Mora and Colfax counties. The principal population centers in the region include Española in Rio Arriba County and Taos in Taos County (Española is south of the forest). Colfax County contains Springer and Raton, both a significant distance east of the Carson NF. Mora County contains Mora, which is much closer but very small. The economies of Taos and Rio Arriba Counties are much larger than those of Colfax and Mora Counties, and account for 77 percent of the employment in the four county area.[60]

Recreation is extremely important to Taos County, as it is the primary tourism attraction. Recreation provides jobs and revenue. The Carson NF is comprised of six ranger districts (RD): Canjilon, El Rito, Jicarilla, Camino Real, Tres Piedras, and Questa. The Questa RD is the primary recreation district on the Carson NF. Visitor spending in the Questa RD is the "largest and most

[57] U.S. Census Bureau, 2010a

[58] U.S. Census Bureau, 2010b

[59] City Data, 2009

[60] USDA Forest Service, 2007 p. 79

influential contributor to the economic impact of the Carson National Forest," much of which can be attributed to winter recreation.[61]

Alpine skiing is the primary winter recreation activity on the Carson NF. Red River Ski Area and TSV are located on the Questa RD. Sipapu Ski Area is located on the Camino Real RD. Of the Carson NF's three ski resorts, TSV the largest ski area. Thus, TSV is one of the largest economic contributors to communities near the Carson NF.

The revenue generated by recreational visitors to the Carson NF is important to communities, but generates mostly service and retail employment. Maintaining or increasing recreational opportunity is a focus of these communities dependent on tourism.[62]

According to the 2007 Socioeconomic Assessment of the Carson NF, ski visitors generated a total of $74.1 million in revenues, 1,140 jobs, and $32.1 million in additional labor income. Visitor spending (including that generated by skiing) contributes a total of 84 percent of the employment and 82 percent of the labor income impacts.[63]

Taos County, Town of Taos, and Village of Taos Ski Valley

Taos County is heavily oriented toward retail and service industries. On average, retail trade accounts for 34 percent of Taos County's total receipts (the largest of any sector). Accommodations and food service amount to 10 percent.[64]

- Retail sales in 2007 for Taos County totaled $309,212,000. The Town of Taos accounted for $243,196,000 (78 percent).
- Accommodations and food service spending in 2007 for Taos County totaled $100,133,000. The Town of Taos accounted for $70,675,000 (71 percent).[65]

Taos Ski Valley benefits from being located near the Town of Taos, which is a regional and national tourist destination. Taos is renowned for restaurants, art galleries, shopping, spas, culture, favorable climate, and outdoor recreational opportunities. The Town provides an escape for visitors staying in TSV, which is especially appealing to non-skiing guests.

The Town benefits from this relationship, as well. In Taos, winter is a slow season for tourism, but ski visitation tends to offset this. Skiers stay in town at lodges, eat out at local restaurants, and shop after skiing. The Town and TSV have numerous collaborations that draw in winter tourism, such as online promotions, paid advertising, TSV-Town shuttles, festival promotion, and a new non-stop weekend shuttle service between Taos and Sante Fe (Taos Express).

The Town of Taos and TSV have collaborated on tourism marketing for decades. The Town estimates that at least 40 percent of the lodgers' tax revenues between December and March are directly related to winter sports stays.[66]

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[61] Ibid. p. ix (Executive Summary)

[62] Ibid. p. 82

[63] Labor income impacts refers to the effect of income from the workforce, when spent in the community.

[64] Taos County Chamber of Commerce, 2011

[65] U.S. Census Bureau, 2010a

[66] Connelly, 2011

Taos Ski Valley and the Village of Taos Ski Valley have an even stronger relationship than the ski area and the Town of Taos. Essentially, all 62 businesses licensed in the Village of Taos Ski Valley are wholly dependent upon the resort to draw visitors to the area. Conversely, the visitor experience of TSV is supported and enhanced by every business in the village. The linkage is easy to recognize with the multitude of snow sports retailers, such as Cottam's Ski Shop and the Boot Doctors, but the symbiotic relationship extends to every type of business in the village. For example, it is unlikely many visitors would travel to the Village of Taos Ski Valley just to patronize Cold Smoke Photography or Chocolate Extreme in the absence of the ski resort. Likewise, the existence of these additional shopping and service amenities increases the attractiveness of TSV as a regional and national ski destination. Local businesses and TSV must work together to create a world class vacation destination and the fate of each is dependent on visitation at and competitiveness of TSV.

Taos Ski Valley, Inc.

Taos Ski Valley, Inc. is primarily a destination resort. As indicated in table 7, the majority of TSV visitors stay overnight, and only about one-quarter are day visitors (either local or from across the region). Taos Ski Valley estimates that approximately 30 percent of its destination guests choose to stay in the Town of Taos. At any given time throughout the ski season, roughly 1,100 of TSV's guests are lodging at hotels, condos, and single family homes throughout the Village of Taos Ski Valley.

Table 7. Taos Ski Valley visitation characteristics

Type of Visit	Percent
Overnight	
Town of Taos	30
Village of Taos Ski Valley	25
Elsewhere	18
Day Visit	
Regional	17
Local	10

Source: TSV

Approximately 70 percent of overnight visitors to TSV stay for three or more nights. The most recent National Ski Area Association (NSAA) research for TSV found that overnight guests to the valley spend, on average, $30 per day on food, $45 per day on retail and shopping, and $50 per day on lodging. All of these figures are per person per day calculations.

Since the 1950, TSV has been an important component of the Taos community—both economically and socially. Taos Ski Valley is the largest employer in Taos County in the winter months, from November 15th through April 10th.[67] The resort typically employs 350 full-time,

[67] Briner, 2011

seasonal staff and 70 full-time, year-round staff. Its annual payroll is roughly $6 million. Most of its employees live and spend their earnings in Taos County.[68]

Employment opportunities at TSV are directly, but not proportionally, related to annual skier/rider visitation at the resort. This means as annual visits go up so will the number of jobs that TSV provides, but at a slower rate. This is a result of some jobs at a ski resort being a fixed cost. For example, the number of lift operators or ski patrollers is dependent upon acreage and infrastructure and is fairly constant, while other labor costs are variable. The number of ski instructors and food and beverage employees needed is dependent on how busy the resort is and can change on a daily basis. Taos Ski Valley estimates the labor requirements grow and shrink at about half the rate of change in skier visits. For example, if skier visits increase by 30 percent then the jobs created would be expected to increase by 15 percent. Conversely, if skier visits drop by 20 percent then about 10 percent of jobs at TSV would be expected to be lost.

A similar relationship can be expected to exist between visitation at TSV and job creation in the Village, as the client base is exactly the same and village businesses have similar fixed and variable cost considerations. Another less correlated relationship can be assumed between visitation at TSV and the Town of Taos, although the relationship would be far less significant because, unlike the Village of Taos Ski Valley, the Town of Taos has many other resources that attract visitors.

Taos Ski Valley, Inc. reports approximately $14 million in gross sales each year. Generally, in resort areas, economic modeling has shown for every dollar that is directly spent at a ski area, two to three dollars (ancillary expenditures) are spent in the local community on other goods and services, such as food and beverage, gas, hotels, and merchandise. Therefore, the $14 million directly spent at TSV roughly translates into an additional $28 to $42 million spent in Taos County (including the Town of Taos) by TSV patrons.

Taos Ski Valley also generates considerable municipal revenues for the Village of Taos Ski Valley. Lodgers taxes produced from overnight stays in the Village and gross receipts taxes (GRT) generated from retail sales, food and beverage sales, rental sales, and lift ticket sales at TSV demonstrate a rough correlation with total skier visits at TSV. Hence, when visitation changes tax revenues to the Village can be expected to roughly follow this trend. Table 8 shows this relationship between 2008 and 2011.

[68] Taos Ski Valley, 2010

Table 8. Taos Ski Valley skier visits, gross receipts taxes, and lodgers tax

	2008/09	2009/10	2010/11
Skier visits	230,000	257,000	193,700
% change		*11.7%*	*-24.6%*
Gross receipts taxes	$1,040,000	$1,197,000	$967,000
% change		15.1%	-19.2%
Lodgers tax	$280,000	$285,000	$224,000
% change		*1.8%*	*-21.4%*

Source: Village of Taos Ski Valley

When job creation and generated spending is considered with GRT and Lodgers tax, which support local governments and regional tourism promotion, TSV is solidified as a substantial economic driver in the Village, Town, and county.[69]

In order for TSV to maintain its viability in providing high-quality recreational opportunities on NFS lands, and to continue to provide economic benefits and generate spending in local economies, the resort must remain competitive in the product they offer to destination skiers. While TSV has maintained its reputation for offering unparalleled expert skiing and riding, it has not responded with new capital investments or on raising service standards and improving the overall recreational experience that it offers. In the process it has failed to evolve commensurate with the demands and expectations of its market. As a result, TSV is experiencing substantially lower annual visitation than it did in the mid-1990s.

National, Regional, and Local Skier Visitation Trends

Despite the continued weak economy, the ski industry saw record-high visitation in the 2010/11 season with 60.54 million visits nationwide, slightly edging out the previous record of 60.50 million in 2007/08.[70] This can be attributed to modest improvement in the travel and tourism market, high average snowfall in all major regions except the southeast, and in turn, longer seasons. The record performance of the 2010/11 season demonstrates the resilience and positive momentum that the ski industry has maintained over the past decade.[71]

In the Rocky Mountain Region as a whole (composed of ID, MT, WY, UT, CO, and NM), total skier visits were up by 2.6 percent in 2010/11 over the previous season—to 20,900,328. Generally, the Region saw higher-than-average snowfall and a longer season as well.

New Mexico, however, was an anomaly, with notably lower visitation in 2010/11 than the previous season, with approximately 791,000 and 958,000, respectively (a 21 percent drop). As a whole, New Mexico has not demonstrated the market strength shown by the rest of the Rocky Mountain Region in the last decade. Skier numbers have fluctuated year-to-year, generally declining. In the 1990s, total New Mexico skier visits averaged 1,050,000 per year.[72] For the

[69] http://www.taosgov.com/finance/grt.php

[70] NSAA, 2011

[71] Ibid.

[72] Includes Angel Fire, Parajito, Red River, Sipapu, Sandia Peak, Sante Fe, Ski Apache, and TSV.

2000s, that average fell to 777,500 (a 26 percent decline).[73] New Mexico's declining trend cannot be blamed entirely on the weak economy, as the ski industry overall saw record visitation in the 2010/11 season.

Taos Ski Valley has comprised approximately 26 percent of New Mexico's total market share for skiing over the last decade, but had an especially steep decline (almost 25 percent) in visitation between 2009/10 and 2010/11. On the surface, this dramatic decline is likely attributable to light snow years, but may also be indicative of a deeper issue. Over the past two decades, TSV has lacked the capital and terrain improvements that affect its ability to respond to customer expectations and to attract and retain guests. As mentioned previously, guest expectations are constantly evolving in TSV's competitive skier/rider market. Skiers and riders are now demanding more diverse lift-served terrain, as well as upgraded lifts and different kinds of recreational opportunities. Similar to the state as a whole, TSV's annual visitation has fluctuated over the last decade. In the 10-year period between the 2000/01 and 2010/11 seasons, TSV averaged 224,484 annual visits. Over the prior decade (1990/91 through 1999/00 seasons) TSV averaged 296,000 annual visits, equating to a nearly 25 percent decline in visitation between the two decades.

Taos Ski Valley averages 130 operational days per season. Going back over the last two decades (between 1990/91 and 2010/11), TSV's highest total annual visitation was 364,000 skiers in 1994/95 (table 9). Since that time, TSV's annual visitation has fluctuated, with a declining trend (figure 2). Taos Ski Valley has not exceeded 300,000 annual visits since the 1997/98 season, in which 300,264 total annual visits were recorded. Table 9 provides information on TSV's annual skier/rider visitation between the 1990/91 and 2010/11 seasons.

Table 9. Annual Taos Ski Valley skier/rider visits from 1991 to 2011

	Season	Annual Visitation
2000s	2010/11	193,796
	2009/10	256,879
	2008/09	241,115
	2007/08	219,002
	2006/07	208,187
	2005/06	158,003
	2004/05	237,441
	2003/04	224,565
	2002/03	249,682
	2001/02	201,113
	2000/01	248,852
	10-Year Average	*224,484*

[73] Ski New Mexico, 2011

Table 9. Annual Taos Ski Valley skier/rider visits from 1991 to 2011

	Season	Annual Visitation
1990s	1999/00	173,031
	1998/99	282,884
	1997/98	300,264
	1996/97	271,862
	1995/96	223,300
	1994/95	364,000
	1993/94	355,020
	1992/93	314,485
	1991/92	355,000
	1990/91	308,000
	10-Year Average	*294,785*

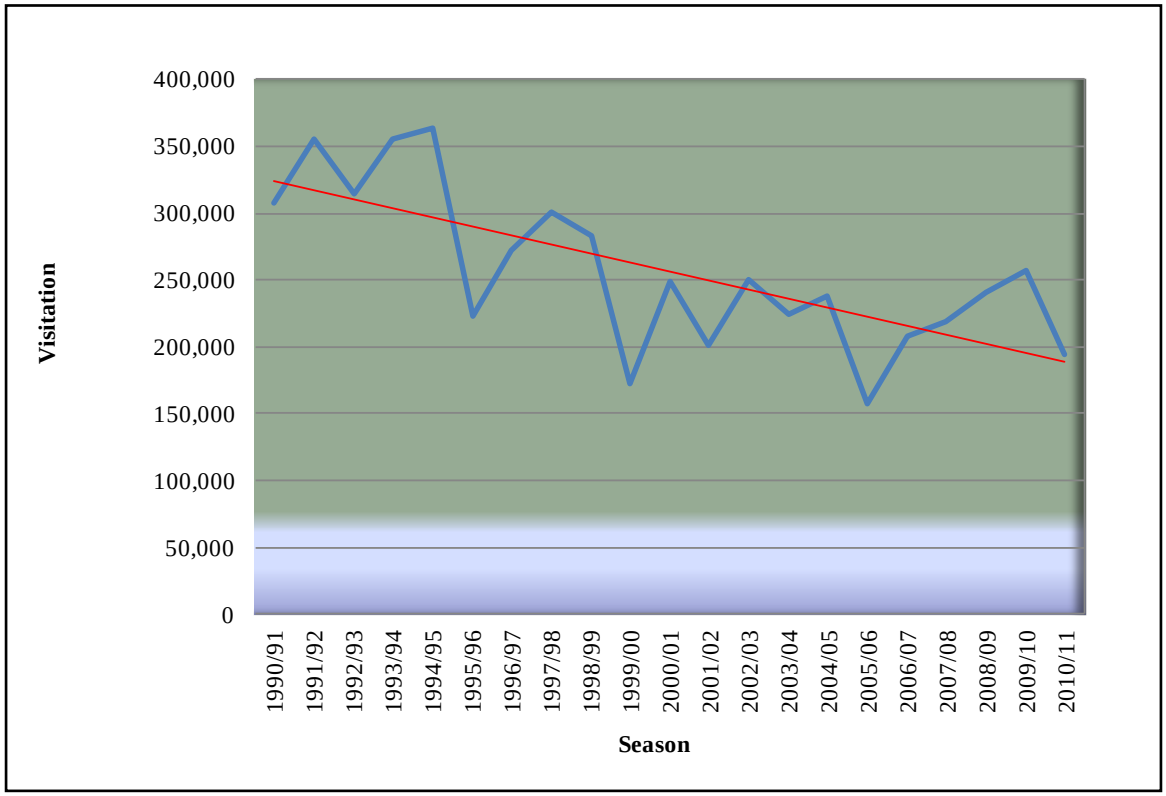

Figure 2. Annual Taos Ski Valley skier/rider visits from 1991 to 2011

Key observations in table 9 and figure 2 include:

- Through the 1990s TSV averaged approximately 295,000 annual visits
- Through the 2000s TSV averaged approximately 222,000 annual visits
- Taos Ski Valley's 10-year average annual visitation dropped by approximately 25 percent between the 1990s the 2000s—from 295,000 to 222,000.
- In the 13 years since TSV last exceeded 300,000 annual visits (1997/98), TSV has averaged approximately 222,000 annual visits.

In the context of its overall decline in annual visitation across the late 1990s and the 2000s, TSV has not added any terrain or invested in significant capital improvements that would lead to an improved recreational experience.[74] In fact, aside from the addition of the *North American* in 2008, the most recent capital improvements at TSV were from the 1981 MDP (lifts 1, 2 and 4 were replaced, and lifts 7, 7a, and 8 were installed in 1984, 1992, and 1995, respectively). In the midst of this, TSV has lost much of the brand recognition that it had in the 1970s and 1980s as destination guests looked elsewhere to resorts that were investing in terrain and infrastructural improvements, as well as to resorts that allowed snowboarding, which was rising in popularity. Further declines in annual visitation are likely to affect the viability of TSV's operation and the ability for it to continue to provide high-quality recreational opportunities on NFS lands.

Environmental Consequences

Alternative 1 – No Action

Alternative 1 does not respond to the primary goal of the 2010 MDP or the purpose and need of the proposed action, which is to make TSV more competitive and to regain its share of the winter sports market. Under alternative 1, it would become increasingly difficult for TSV to remain a viable provider of the recreational opportunities for which it is known. In turn, the significant economic and recreational benefits that have been realized by the local and regional communities for over 50 years would be expected to erode.

Visitation

It is likely TSV's lack of terrain and capital improvements over the past two decades, combined with its slow embrace of the snowboarding market and, to a certain degree, inconsistent snowfall, directly contributed to its gradual decline in annual visitation throughout the 2000s. Since alternative 1 would not include approval of any new terrain or capital improvements within TSV's SUP area, annual visitation at TSV is expected to continue to fluctuate year-to-year, as it has over the last decade. Lack of capital improvements would likely make TSV more reliant on natural snowfall to define its recreational experience. It is likely TSV's annual visitation would continue to hover around 225,000 in the short-term, with a decline over the long-term, as infrastructure continues to age and destination skiers/riders look elsewhere to resorts that have invested in projects that substantively improve their recreational offerings and experience.

[74] Very few of New Mexico's resorts have made any substantial capital improvements in this time period.

Economic Effects

Absent any increases in annual skier/rider visitation, alternative 1 would translate to more difficulties in TSV maintaining its viability for providing recreational opportunities. This would directly translate to a commensurate decrease in TSV's contributions to the northern New Mexico economy (including the Town of Taos and Taos County).

Skiers and riders at TSV are frequent patrons of businesses in the Town of Taos, the county and the Village of Taos Ski Valley. If visitation at TSV decreases, it can be expected that tourism spending in the county, Town, and Village would also decrease. While Taos County and Town of Taos have additional sources to draw tourism spending and would feel the effects of decreased visitation less than the Village of Taos Ski Valley, all three of the jurisdictions would be negatively impacted by the continued decline in TSV visitation. The village would likely face more substantial economic impacts than the town or the county as a whole.

As outlined in the affected environment section, job creation at TSV and the Village of Taos Ski Valley is directly related to skier visitation, while job creation in the Town of Taos and in Taos County is indirectly related to skier visitation at TSV. Under alternative 1, annual visitation at TSV is expected to decline in the long-term, resulting in commensurate (indirect) declines in employment opportunities at local businesses in the Town of Taos.

Long-term decreases in TSV visitation under alternative 1 are also expected to result in fewer Lodgers Tax and GRT revenues for both the Village of Taos Ski Valley and the Town of Taos, as TSV skiers and riders make up a considerable proportion of lodgers, shoppers, and diners in their municipalities.

Tribal Concerns

Taos Pueblo land is in the vicinity of TSV, but is not directly adjacent. It is located less than 2 miles south of the Village, adjoining the Wheeler Peak Wilderness area boundary. As discussed, the Taos Pueblo has raised concerns about existing and future operations and activities at the ski area and how lands of cultural significance could be affected. Most of Taos Pueblo's concern is centered on hiking and trespass of tribal lands during the summer months. Under alternative 1, access throughout the SUP area would not change, and there would be no potential for increased trespass on tribal lands.

Alternative 2 – Proposed Action

Alternative 2 includes proposed projects designed to respond to the purpose and need for action, which is the overarching goal for TSV to remain economically viable by being competitive in the destination skier/rider market and continuing to provide a quality recreational experience into the future. Alternative 2 is a suite of projects taken from the 2010 MDP.

Visitation

An increasing population is a positive indicator for TSV's future business operations, as growth in visitation is partially tied to the population of their local market. As discussed in the Existing Conditions section, the populations of both Taos County and the Town of Taos have increased since the 2000 Census (9.9 and 21.6 percent, respectively). Looking towards the future, moderate growth is projected to continue in Taos County, to a total population of approximately 44,000

people by 2040.[75] This trend, combined with annual visitation increases that other western resorts have recently experienced in conjunction with lift/terrain projects (as discussed previously under Existing Conditions) support the expectation that alternative 2 would increase TSV's annual visitation.

Based on (but not limited to) recent lift/terrain projects at other western resorts, and resulting increases to annual visitation, the new high alpine lifts and additional lift-served advanced intermediate terrain proposed in alternative 2 could generate an initial spike of between 15 and 20 percent in annual visitation at TSV for the first 3 to 5 years. These projects would potentially reduce the importance of natural snowfall in visitation at TSV. It is anticipated the most of this spike would be attributable to the Main Street Lift providing lift service to advanced intermediate terrain. The ability of the Ridge Lift to generate additional visitation cannot be discounted, as it would provide lift service to the Wild West Glades, additional terrain for the advanced intermediate.

Alternative 2 also includes other proposed mountain improvement projects that would be phased in over 2 to 7 years. The Snowtubing Center and interpretive snowshoe trails (Adventure Center) would provide additional recreational opportunities and would build on the interest generated by the Main Street Lift, Ridge Lift, and added advanced intermediate terrain the two lifts would serve. A conservative estimate is that over the long-term (7 years and beyond) alternative 2 would increase the annual visitation at TSV by an average of 10 to 15 percent.[76] Overall, alternative 2 would allow TSV to offer a more comprehensive multi-season recreation experience, to induce and support increases in visitation.

The proposed Mountain Bike Trail is intended to be an additional summer amenity. This single lift-served trail is not expected to induce a quantifiable increase in summer visitation at TSV or create new jobs. It would therefore not measurably affect economic conditions in TSV or the surrounding communities. For more information on multi-season recreation please refer to the Recreation section earlier in this chapter.

Economic Effects

Short- and long-term increases in annual visitation would also be expected to have positive economic impacts across northern New Mexico and, in particular, in Taos County, the Town of Taos, and the Village of Taos Ski Valley. With 30 percent of TSV's current visitors staying in the Town of Taos during the ski season, an increase in visitation would subsequently lead to more occupancy and revenue in town during this time.[77]

It is anticipated alternative 2 would lead to even more positive economic impacts for local businesses in the Village of Taos Ski Valley. Changes in pedestrian circulation from the new East Guest Drop-Off Area would be intended to provide a more welcoming arrival experience. The new entrance design would include signs and walkways to redirect foot traffic to all businesses in the base area. With projected increases in annual visitation from alternative 2, local merchants could expect an increase in business. The change in pedestrian circulation from the proposed East

[75] University of New Mexico Bureau of Business and Economic Research, 2003

[76] For reasonably foreseeable future projects with potential to increase annual visitation at TSV, refer to the cumulative effects section.

[77] Incidentally, the Town of Taos has endorsed TSV's 2010 MDP (and by default alternative 2), stating, "We need these TSV improvements to sharpen our competitive advantage for winter tourism." (Connelly, 2011)

Guest Drop-Off Area and subsequent realignment of the footbridge to Alpine Village would also improve access to base area shops, especially those located in Alpine Village.

Increased short- and long-term employment could be expected as a result of alternative 2. A short-term increase in employment would occur during the construction and installation phases of projects (e.g., lifts, glades, parking lot improvements), which are expected to occur over two to seven construction seasons. In the long-term, TSV expects to hire three full time year-round employees and 40 to 50 full time seasonal employees as a result of alternative 2. These job creation numbers reflect not only an expected increase in visitation, but also an increase in labor needs for the additional infrastructure and skiing acreage associated with alternative 2. Indirect employment across Taos County could be expected as related to increased winter tourism (i.e., hotels and the service industry).

Furthermore, the long-term increases in TSV visitation under alternative 2 are also expected to result in greater Lodgers Tax and GRT revenues for both the Village of Taos Ski Valley and the Town of Taos, as TSV skiers and riders make up a considerable proportion of lodgers, shoppers, and diners in their municipalities.

Tribal Concerns

Taos Pueblo land is in the vicinity of TSV, but is not directly adjacent. It is located less than 2 miles south of the Village, adjoining the Wheeler Peak Wilderness area boundary. As discussed, the Taos Pueblo has raised concerns about existing and future operations and activities at the ski area and how lands of cultural significance could be affected by alternative 2. Most of Taos Pueblo's concern is centered on hiking and trespass of tribal lands during the summer months. Under alternative 2, access above Lift 5 (mid-way up the front side of the mountain) would not change. Neither Main Street Lift nor the Ridge Lift would be operated during the summer. Alternative 2 would not increase the potential for hikers in the area to trespass on tribal lands.

Alternative 3

Alternative 3 includes some of the components proposed in TSV's 2010 MDP; however, it does not include Main Street Lift, the Ridge Lift, Snowtubing Center, or the East Guest Drop-Off Area.

While alternative 3 is expected to improve the recreational experience at TSV, is not expected to make TSV competitive again, to regain its share of the winter sports market, or to ultimately allow TSV to maintain its viability as a provider of high-quality recreational opportunities on the Carson NF. As with alternative 1, the significant economic benefits that have been realized by the local and regional communities for over 50 years would be expected to erode in the future.

Visitation

Annual visitation under alternative 3 would be expected to closely resemble alternative 1, continuing to hover around 225,000 visitors per day in the short-term. Further decline is expected in the long-term, as TSV's competitive edge in the ski industry continues to erode. Destination skiers/riders would be expected to look elsewhere to resorts that have invested in projects that substantively improve their recreational offerings and the quality of experience.

Replacement of lifts 4, 5 and 7 are likely not enough, in and of themselves, to stimulate additional visitation at TSV, because these are necessary upgrades to infrastructure that is already in place.

Added amenities such as interpretive snowshoe trails and lift-served mountain biking are important to rounding out the recreational experience at TSV, but are not the types of projects that induce additional visitation without more substantial new projects that serve as a foundation for generating new interest/excitement.

Economic Effects

In the short-term, alternative 3 would generate increases in construction-related employment. However, it is not anticipated alternative 3 would be accompanied by any long-term impact to employment, as none of the projects would require additional permanent or seasonal positions.

As with alternative 1, decreasing TSV visitation under alternative 3 can be expected to be accompanied by decreasing tourism spending in the town, county, and village. While the County and Town of Taos have additional sources to draw tourism spending and would feel the effects of decreased visitation less than the Village of Taos Ski Valley, all three of the jurisdictions would be negatively impacted by the continued decline in TSV visitation. The village would likely face more substantial economic impacts than the town or the county as a whole.

As mentioned previously, job creation at TSV and the Village of Taos Ski Valley is directly related to skier visitation, while job creation in the Town of Taos and in Taos County is indirectly related to skier visitation at TSV. Under alternative 3, visitation is expected to decline in the long-term, resulting in direct and indirect declines in employment opportunities in the local economies.

Long-term decreases in TSV visitation under alternative 3 are also expected to result in fewer lodgers tax and GRT revenues for both the Village of Taos Ski Valley and the Town of Taos, as TSV skiers and riders make up a considerable proportion of lodgers, shoppers, and diners in their municipalities (particularly in the winter).

Tribal Concerns

Taos Pueblo land is in the vicinity of TSV, but is not directly adjacent. It is located less than 2 miles south of the Village, adjoining the Wheeler Peak Wilderness area boundary. As discussed, the Taos Pueblo has raised concerns about existing and future operations and activities at the ski area and how lands of cultural significance could be affected. Most of Taos Pueblo’s concern is centered on hiking and trespass of tribal lands during the summer months. Under alternative 3, access throughout the SUP area would not change, and there would be no potential for increased trespass on tribal lands.

Cumulative Effects

From a social and economic perspective one of the most critical recent actions that helped keep TSV’s place in the ski industry was its decision in 2008 to accept snowboarding. Taos Ski Valley’s decision to allow snowboarders has broadened its appeal in the Rocky Mountain Region, and snowboarders now make up 18 percent of TSV’s market. That in itself has helped TSV to remain economically viable over the past three seasons.

While changes in employment, retail sales, and tax revenues to local communities have been discussed in the preceding environmental consequences section as indirect effects, it is important to reiterate the cumulative changes in visitation at TSV has on the surrounding communities. Taos Ski Valley has strong economic relationships with the Town and County of Taos as well as the

Village of Taos Ski Valley. If TSV is performing well, it is likely businesses in the surrounding area will as well. The same is true for local business success and TSV. The resort benefits from the additional shopping and service amenities the communities provide because they increase the attractiveness of TSV as a regional and national ski destination. Likewise, the communities benefit from the visitors that TSV draws to the region. Local businesses and TSV must work together to create a world class vacation destination and the fate of each is reliant on visitation at and competitiveness of TSV.

Taos Ski Valley 2010 Master Development Plan

Taos Ski Valley's 2010 MDP identifies existing limitations and opportunities across the resort which, upon being addressed, would allow TSV to continue meeting visitor demand for a quality recreational experience. By doing so, TSV could reestablish its economic viability in the competitive ski industry. The majority of the projects identified in the 2010 MDP are currently undergoing site-specific NEPA analysis in alternative 2 of this Draft EIS. However, the 2010 MDP identifies other long-term projects throughout the SUP area that are designed to further improve the overall recreational experience at TSV, which are anticipated to drive additional visitation that could help reestablish TSV in the Rocky Mountain Region. All of these future 2010 MDP projects would require site-specific NEPA analysis/approval before they could be implemented.

Development within the Village of Taos Ski Valley and Pattison Trust Land

Private land developments within the Village of Taos Ski Valley and Pattison Trust have added roads, and residential and commercial development in the vicinity of TSV. These developments support restaurants and retail sales in the vicinity of the resort and offer amenities that increase employment in the area. It is anticipated the Village would continue grow in the future; however, there are no specific proposals at this time that can be defined or analyzed.

Village of Taos Ski Valley Master Plan

The Village of Taos Ski Valley Master Plan is a guiding document for the community that outlines the long-term goals for growth and development within the village. It was last updated in November of 2010. While the plan creates no specific regulations or codes that must be enforced, it does encourage appropriate development decisions to be made within the Village of Taos Ski Valley. Six development districts are identified in the plan: (1) Village Core; (2) Kachina Center; (3) Amizette; (4) Commercial Recreation; (5) Neighborhood; and (6) Farming/Recreation. While the plan suggests land use and design standards for each district, no reasonably foreseeable projects, proposals, or future development can be extracted from the plan. It can be expected, however, that if new private development were induced as a result of increased visitation from any of the proposed actions, it would be adequately managed by the Village of Taos Ski Valley government and the Master Plan.

Townsite Act Wastewater Treatment Facility

The Village of Taos Ski Valley Master Plan has found that "new development may be limited until such time that a new wastewater treatment plant is constructed, or changes to the plant capacity, are approved."[78] Also, the Village has submitted a proposal to the Forest Service to

[78] Village of Taos Ski Valley, 2010

purchase approximately 70 acres of National Forest System (NFS) land on the Carson National Forest under the authority of the 1958 Townsite Act for the purpose of improving community services and expanding local public facilities, specifically the Village Wastewater Treatment Facility. The proposal has not been accepted by the Forest Service at this time.

The existing wastewater treatment plant has adequate capacity to service TSV's 2010 MDP projects and associated visitation levels (it has handled loads that were associated with annual skier/rider visits in excess of 350,000 in the past).

Upgrades to the wastewater treatment system in the Village would not be expected to have significant direct impacts to the socio-economics of the area. However, when considered in combination with increased visitation resulting from the proposed actions and new private development that may take place in response, the contemplated Wastewater Treatment Facility is a critical component of economic and physical growth within the Village.

Pattison Trust Mountain Biking

The Pattison Trust is currently considering improving a 1,400-acre forested area on private lands for outdoor recreation, including some additional mountain biking trails. When this private development is considered in conjunction with the proposed TSV Mountain Bike Trail a cumulative increase in summer recreational opportunities in the immediate area around TSV can be expected. While summer opportunities would be increased around TSV, the relative draw of this activity is minimal when compared to the scale of winter and other summer recreation in the area.

Irreversible and Irretrievable Commitment of Resources

No irreversible and/or irretrievable commitments of social and economic resources have been identified in association with the alternative analyzed in this document.

Environmental Justice

In 1994, President Clinton issued Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" to ensure such populations are not subject to disproportionately high levels of environmental risk.[79] EO 12898 provides that "each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." EO 12898 makes it clear that its provisions apply fully to programs involving Native Americans.

In the memorandum to heads of departments and agencies that accompanied EO 12898, President Clinton specifically recognized the importance of the procedures under NEPA for identifying and addressing environmental justice concerns.[80] The memorandum particularly emphasizes the importance of the NEPA's public participation process, directing that "each federal agency shall provide opportunities for community input in the NEPA process." Agencies are further directed to "identify potential effects and mitigation measures in consultation with affected communities, and improve the accessibility of meetings, crucial documents, and notices."

While the Council on Environmental Quality (CEQ) has oversight of the federal government's compliance with EO 12898 and NEPA, EO 12898 established a Federal Interagency Working Group chaired by the Environmental Protection Agency (EPA) and comprised of 11 federal departments and agencies, as well as several White House offices. EPA's Office of Environmental Justice, while overseeing the integration of environmental justice into EPA's policies, programs and activities, serves as the lead on the Federal Interagency Working Group to incorporate environmental justice into all federal agencies.

Taos County is racially diverse, with 55.8 percent Hispanic or Latino, 36.3 percent White (not Hispanic), and 6.2 percent American Indian. Approximately 45 percent of residents live in households where English is not spoken at home.[81]

Although Taos County has a large proportion of minority and low-income populations, none of them would be disproportionately affected by any of the proposed projects at TSV. In fact, the projects that are included in the action alternatives are of the type that would likely bring more people and more spending/revenue to Taos and Taos County, which would benefit residents regardless of economic or ethnic makeup.

[79] 59 Federal Register 7629, 1994; *Disproportionately* is a generic term used to define the adverse effects of environmental actions that burden minority and/or low-income populations at a higher rate than the general public.

[80] Memorandum from the President to the Heads of Departments and Agencies. Comprehensive Presidential Documents No. 279 (February 11, 1994)

[81] U.S. Census Bureau, 2010a

Parking and Ski Area Access

The scope of this parking and ski area access analysis is confined to TSV's day parking areas and guest drop-off area on Sutton Place Road and proposed East Guest Drop-Off Area on Thunderbird Road. Vehicular access for residents and overnight guests to Thunderbird Road and Twining Road is also discussed.

Affected Environment

Access to Taos Ski Valley

All vehicles access TSV by turning east from US-64 (Paseo Del Pueblo Norte), 4 miles north of the Town of Taos, and driving 15 miles northeast on NM-150 (location map)—a paved, two-lane road. Approximately 10 miles from Arroyo Seco, NM-150 ends at TSV's day skier parking lots. Overnight guests and residents at the Village of Taos Ski Valley drive through the day skier lots to access residences and condos located on private roads.

The Taos Municipal Airport is available for small private planes; there is no commercial service to Taos. The closest commercial airport is the Albuquerque International Sunport, approximately 150 miles away. The majority (roughly 73 percent) of TSV's skiers and riders are destination guests who travel to the resort from across the Rocky Mountain region and nation, staying for multiple days. Of this majority, roughly 25 percent stay at TSV, 30 percent stay in the Town of Taos, and 18 percent stay elsewhere within Taos County. The remaining 27 percent of TSV's guests are day skiers and riders who reside in the local area or live within driving distance to the resort from across northern New Mexico.[82]

Additionally, New Mexico's new commuter rail (Rail Runner) offers frequent trains running from Albuquerque to Santa Fe. Shuttles are available from the Santa Fe Railyard District Station to the Town of Taos, where visitors can use a shuttle or a personal vehicle to get to TSV.

Parking

As indicated previously, NM-150 dead ends at TSV's day parking lots—all of which are located on NFS lands within TSV's SUP area. The TSV entry sign is just before the Gila Lot.[83] These day parking lots total roughly 15 acres, with approximately 1,740 parking spaces (table 10). As indicated in table 10, on days when TSV's existing comfortable carrying capacity (CCC) of 3,520 guests is reached, the resort has a surplus of roughly 500 parking spaces available, which accounts for:

- An average vehicle occupancy (AVO) of 2.6
- Approximately 110 cars per acre
- Destination guests who do not park in day skier lots or guests who arrive by bus[84]

[82] Information provided by TSV management.

[83] Each of the parking lots are given the name of an animal.

[84] First-hand observations confirm that AVO at TSV is 2.6 people, which aligns with the ski industry average of between 2.3 and 2.7 people per car. Taos Ski Valley staff has also documented that TSV's AVO increases on days when its CCC is exceeded.
Taos Ski Valley typically parks approximately 105 to 115 cars per acre, which is lower than an industry average of 120 cars per acre. This inefficiency can be attributed to many factors, including (but not limited to): parking lot

On peak days, when TSV's existing CCC is exceeded by up to 25 percent (approximately 6 to 10 days per season), TSV can accommodate visitation approaching 4,400 guests.

Table 10 summarizes the results of a detailed planning analysis conducted for the 2010 Master Development Plan (MDP) that accounts for all aspects of TSV's current parking configuration, including: CCC (i.e., day skiers/riders); guests parking at off-site accommodations; guests arriving by shuttles and buses; employee parking requirements; and average vehicle occupancies.[85]

Table 10. Taos Ski Valley's existing parking capacities

Existing CCC (3,520 + 5% non-skiing/riding guests)[a]	3,696
Estimated number of guests parking off-site	725
Estimated number of guests arriving by shuttle	200
Estimated number of guests parking in day lots	2,771
Estimated number of guests arriving by car (92%)	2,549
Estimated number of guests arriving by charter bus (8%)	222
Required number of guests car spaces (based on AVO)[b]	992
Required charter bus parking spaces = 6 (1 bus = 4.5 car spaces)	25
Required employee car parking spaces	175
Car parking spaces for overnight guests at Edelweiss, Sierra del Sol, Twining and other nearby condos	46
Total required spaces	1,238
Existing parking spaces	1,740
Parking Space Surplus	**+502**

[a] CCC = comfortable carrying capacity
[b] AVO = average vehicle occupancy (2.6 passengers)

Bus parking spaces are currently located on the north east section of the Armadillo lot. RV and employee parking are currently located in the Coyote lot. Existing handicapped parking is located just west of the Guard House on the north side of the Armadillo Lot. Approximately 30 pay parking spaces are located directly east of the Guard House, at the intersection of Sutton Place and/or north and west of the Guard House depending on demand. With the exception of bus parking spaces, all of the above mentioned parking space types are included in the existing parking spaces calculation.

In addition to day lots operated by TSV, there are designated parking spaces at accommodations on private lands, within walking distance of the base area (e.g., Edelweiss, Sierra del Sol, and

configuration, parking strategy during days with lower skier visits versus the strategy on "peak days," snow removal and storage, and parking attendants' ability to direct guests.

[85] Includes Snakedance Condominiums, Hotel St. Bernard, Snow Bear Inn and Condominiums, and Kandahar Lodge.

Twining Condos). At any given time throughout the ski season, roughly 1,100 of TSV's guests are lodging at hotels, condos, and single family homes throughout the Village of Taos Ski Valley.[86]

Vehicular and Pedestrian Circulation

The majority of TSV's day skiers and riders park in day lots and take TSV shuttles to the drop-off area/turnaround, which is located on private land at the end of Sutton Place Road, known as the Pagoda. A small percentage of guests either walk to the base area after parking their cars or are dropped off near the guard house at the entrance to Sutton Place Road. Under either scenario, all pedestrians are directed up Sutton Place Road to access ticketing/guest services and Lift 1. Alternate walking routes include taking a pedestrian bridge between the guardhouse area and the Alpine Village (a complex of shops and a restaurant) on Thunderbird Road, and walking along Thunderbird Road to a stairway and bridge that leads directly to the resort center.

Regardless of whether they are dropped off by shuttle/car or walk from the parking lots, all guests must ascend a 30-foot or more elevation change between the Pagoda and the base of Lift 1. For guests wearing ski boots, carrying gear, and/or accompanying children, this is an inconvenience that affects the recreational experience from the initial point of entry or a visitor's "sense of arrival" to the resort.

Conveying a "sense of arrival" at the interface with base area guest services and on-mountain access is an important element in defining the guest experience at any resort.[87] Creating an on-grade pedestrian access route from the shuttle drop-off to guest services and Lift 1 is a high priority for TSV. Existing factors that detract from TSV's sense of arrival are:

- Pedestrians, TSV shuttle buses, and personal vehicles all circulate at the entrance to and along Sutton Place Road.
- Base area buildings obstruct a guest's view of the mountain from the existing drop-off area (Pagoda) and down by the Guard House.
- Guests must walk up steps to and through the Pagoda to access guest services/ticketing and Lift 1.

On the eastern edge of the day parking lots, Twining and Thunderbird roads provide access to homes, condominiums, and hotels for residents and overnight guests staying in the Village of Taos Ski Valley. In order to reach Twining and Thunderbird roads, vehicles must navigate through TSV's day lots, which accommodate both one-way and multi-directional traffic, as well as parking on Twining Road and Thunderbird Road in relation to TSV's day lots and base area (map 4 in appendix A).

As NM-150 ends, residents and overnight guests are routed to the eastern side of TSV's day parking lots through the Armadillo lot. Once past Sutton Place Road, residents and guests can access either Thunderbird Road or Twining Road. To return back to NM-150, the Coyote lot is used. Mixing residential and overnight guest traffic with day skiers throughout the parking lots creates circulation issues and inefficiencies for resort operations. Mixing day skiers who are

[86] Note: Ordinance No. 10-30 (Village at Taos Ski Valley, 1997) requires all future development of residential units within the Village of Taos Ski Valley to have dedicated, on-site parking.

[87] Travel industry dictionary (http://www.travel-industry-dictionary.com/sense-of-arrival.html)

parking their vehicles with through traffic within TSV's day lots is not an ideal situation for either guests or residents.

Environmental Consequences

Alternative 1 – No Action

Under alternative 1, TSV would continue current management of parking and vehicular/ pedestrian circulation within the SUP area, with no operational or infrastructural changes.

Parking

Taos Ski Valley's day parking capacity would continue to be approximately 1,740 vehicles under alternative 1, with roughly a 500-space surplus on days when the CCC is reached (table 11).

Bus, RV, employee, and handicapped spaces would be maintained, as would approximately 30 pay parking spaces located directly east of the Guard House, at the intersection of Sutton Place and/or north and west of the Guard House near the existing bus parking. No change would occur to the designated parking spaces at accommodations within walking distance of the base area (e.g., Edelweiss, Sierra del Sol, and Twining Condos) under alternative 1.

Vehicular and Pedestrian Circulation

Taos Ski Valley's guests would continue to access the resort and the Village of Taos Ski Valley via NM-150 and through the existing parking lots. Under alternative 1, access to homes, condominiums and hotels located on Thunderbird and Twining roads would continue to be influenced, and in many cases hindered, by mixing day skiers who are parking their vehicles with through-traffic throughout TSV's day lots.

Under alternative 1, guests would continue to be dropped off at the Pagoda on Sutton Place Road and walk uphill (approximately 30 feet in elevation) to access guest service facilities and load Lift 1.

Alternative 2 – Proposed Action

Management Area (MA) 16 standards and guidelines from the 1986 Forest Plan include: "Administer the existing ski areas in accordance with the direction in the Master Development Plan for each area."[88] Taos Ski Valley's 2010 MDP (which has been accepted by the Carson NF) identifies the existing guest drop-off situation as a high-priority planning issue that needs to be resolved in order to improve the recreational experience.

Key concepts identified in the 2010 MDP for addressing TSV's circulation/guest drop-off issues include the East Guest Drop-Off Area. Alternative 2 includes strategic reconfigurations of TSV's day parking lots and the East Guest Drop-Off Area that would improve the "sense of arrival" at TSV, as well as vehicular circulation and pedestrian access to the resort and local businesses.

[88] USDA Forest Service, 1986d

Parking

Under alternative 2, TSV's CCC would go from 3,520 to 4,200. As discussed in the Recreation section, a conservative estimate for the long-term (7 years and beyond) would be a 10 to 15 percent increase in annual visitation. This increase would result in more demand for parking on a daily basis. While the existing surplus of day parking spaces can absorb most of this increased demand, the total number of parking spaces under alternative 2 would be reduced, due to the proposed reconfiguration of TSV's parking lots (discussed below). The result is alternative 2 would reduce TSV's day parking surplus, from roughly 500 spaces to roughly 80 spaces (table 11). The proposed reconfiguration of TSV's day parking lots is depicted in map 4 in appendix A.

The overall decrease in parking spaces is a result of three components included in alternative 2: (1) the proposed conversion of the Bison lot to a new entry road; (2) the construction of the proposed East Guest Drop-Off Area; and (3) strategic widening of individual parking lots (map 4 in appendix A). Although an additional parking lot would be constructed north of the Armadillo lot, this lot would not fully compensate for the overall loss of parking capacity. Therefore, under alternative 2, the total number of spaces available for TSV's day skiers/riders would decrease by approximately 109 spaces, from 1,740 to 1,631 (table 11).

Although TSV's total number of day parking spaces would decrease, this is not anticipated to be a problem except on rare peak days (e.g., during the spring break periods). On peak days, when TSV's CCC is anticipated to be exceeded, more rigorous management of the parking situation would be required. Taos Ski Valley would put an increased emphasis on directing guest parking to improve parking efficiency (i.e., the number of vehicles that can be parked per acre). In addition, TSV would work with local transit services to add routes and shuttles. Finally, TSV would promote or provide incentives for guests and employees to carpool or use shuttles to get to TSV from Taos and the surrounding area. This would substantially improve parking capacity.

Under alternative 2, RV and employee parking would be maintained in the Coyote lot, as would approximately 30 pay parking spaces located directly east of the Guard House, at the intersection of Sutton Place and/or north and west of the Guard House near the existing bus parking. No change would occur to the designated parking spaces at accommodations within walking distance of the base area (e.g., Edelweiss, Sierra del Sol, and Twining Condos) under alternative 2.

Under alternative 2, bus and handicapped parking would be maintained, but relocated to more accessible locations in the reconfigured East Guest Drop-Off Area.

Vehicular and Pedestrian Circulation

Alternative 2 would substantially improve vehicular circulation within and between TSV's day parking lots. This alternative would provide better separation of individual lots and more defined vehicular thoroughfares. The result would be improved efficiency, navigability, and reduced vehicular/pedestrian interface. The proposed parking lot reconfiguration under alternative 2 is depicted in map 4 in appendix A.

The proposed reconfiguration of the existing Bison lot to serve as a main entry road for TSV would result in a key circulation improvement. This would separate residential and overnight guest traffic from day skiers/riders accessing the parking lots by car, on foot, or by shuttle. It would allow for a relatively unencumbered flow of traffic for guests traveling beyond the parking

lots (e.g., to the drop-off area, the base area, overnight lodging facilities, and private residences) and relieve congestion historically caused by entering and exiting parking spaces.

By becoming the main entry portal to TSV, the East Guest Drop-Off Area would substantially improve the visitor experience by contributing to an active pedestrian environment, further adding to a positive sense of arrival for guests to TSV.[89] This would accommodate a river walk entrance to the main plaza and Lift 1, eliminating difficult stairways with a redeveloped streetscape. Furthermore, the East Guest Drop-Off Area would allow guests views of the mountain, reinforcing a positive sense of arrival with visual cues of lifts and ski trails that have become standard at world-class ski resorts.

Combined with future projects on private, base area lands (including improved and relocated pathways); the East Guest Drop-Off Area would also create dedicated pedestrian routes that would alleviate conflicts between pedestrians, TSV shuttle buses, and personal vehicles.

The proposed East Guest Drop-Off Area and pedestrian pathways have the potential to improve foot traffic to merchants that have businesses in and around TSV's base area. During the Phase 1 scoping process, TSV personnel met with local merchants to come up with a design that did not redirect visitors away from businesses on route to the base area. The result was an agreement to realign the existing footbridge leading to the Alpine Village commercial area, if the East Guest Drop-Off Area was approved and implemented. The realignment would minimize impacts to local business and offer guests additional shops en route to the base area.

Alternative 2 would give pedestrians the option to continue using Sutton Place Road to access the base area or access through the new East Guest Drop-Off Area (map 4 in appendix A).

Alternative 3

Under alternative 3, parking and vehicular/pedestrian access at TSV would be identical to alternative 1. Taos Ski Valley's guests would continue to access the resort via NM-150 and the existing parking lot corridors. Access to homes, condominiums, and hotels located on Thunderbird and Twining roads would continue to be influenced by mixing day skiers who are parking their vehicles with through-traffic. Alternative 3 would also maintain TSV's day parking capacity of approximately 1,740 vehicles, with roughly a 500-space surplus on days when the CCC is reached.

Table 11. Summary of Taos Ski Valley's parking capacity by alternative

	Alternative 1	Alternative 2	Alternative 3
Comfortable carry capacity (CCC) (+5% non-skiing/riding guests)	3,696	4,410	3,696
Estimated number of guests who park off-site	725	725	725
Estimated number of guests who arrive by shuttle	200	200	200

[89] An active pedestrian environment refers to the existence of a myriad of retail shops and dining and pleasant urban design that engages pedestrians and makes the environment exciting or pleasurable to walk through.

Table 11. Summary of Taos Ski Valley's parking capacity by alternative

	Alternative 1	Alternative 2	Alternative 3
Estimated number of guests who park in day lots	2,771	3,485	2,771
Estimated number of guests who arrive by car (92%)	2,549	3,206	2,549
Estimated number of guests who arrive by charter bus (8%)	222	279	222
Required car parking spaces (based on an AVO of 2.57)	992	1,248	992
Required charter bus parking spaces = 7 (1 bus = 4.5 car spaces)	25	31	25
Required parking spaces for snowtubing guests	N/A	50	N/A
Required employee car parking spaces	175	175	175
Car parking spaces for overnight guests at Edelweiss, Sierra del Sol, Twining and other nearby condos	46	46	46
Total required spaces	1,238	1,550	1,238
Total parking spaces	1,740	1,631	1,740
Parking Space Surplus	**+502**	**+81**	**+502**

Cumulative Effects

Cumulative effects analyzed in this section apply to all alternatives, including the no action alternative. For a detailed description of past, present and reasonably foreseeable future projects, the reader is referred to appendix B.

The temporal bounds for this cumulative effects analysis for ski area access and parking extend from TSV's inception as a resort in 1955 through the foreseeable future in which TSV can be expected to operate. The spatial bounds for this cumulative effects analysis are limited to TSV's day parking areas and guest drop-off areas on Sutton Place Road. Vehicular access for residents and overnight guests to Thunderbird Road and Twining Road is also considered.

Parking and ski area access has evolved at TSV since its development in 1955. At first, TSV was supported by a small, 50-car parking lot near the existing shuttle drop-off area. Over the years, additional parking and vehicular circulation was developed within the TSV SUP area. The most recent parking lot development—the Deer, Eagle, and Gila lots—occurred over 25 years ago. Since that time, the existing parking configuration has provided ample parking for even the busiest days at TSV (4,400 guests) with a large surplus of parking spaces. While there are differences between the parking and vehicular circulation configuration between TSV's accepted 2010 MDP and alternative 2 (as result of wetlands that were subsequently identified), the parking and vehicular circulation improvements considered in this analysis are considered inclusive of those contemplated in the 2010 MDP. Taos Ski Valley's Summer Operations Plan could bring

additional visitors to TSV in the off season, but summer visitation (and requisite parking needs) is much lower than what is required for the winter season. Future private land development in the area is necessarily speculative at this time and cannot be discussed or analyzed in detail at this time. While it is reasonable to assume that this may increase vehicular traffic through the day parking lots between NM-150 and Thunderbird/Twining roads, the projects contained in alternative 2 would be beneficial. Finally, the Village of Taos Ski Valley has mandated that all new development have dedicated, on-site parking and therefore future private land development would not affect TSV's parking needs.

Irreversible and Irretrievable Commitment of Resources

No irreversible or irretrievable commitments of resources related to access and parking have been identified.

Cultural Resources

The scope of this analysis focuses on the cultural and historic resources recorded within and near TSV's SUP area that could be affected by the activities proposed in the TSV MDP Phase 1 Projects.

Federal Direction

Projects on federal lands, or with federal funds, must comply with the provisions of the National Historic Preservation Act (NHPA) of 1966, as amended; Executive Order 11593; and the Archaeological Resources Protection Act (ARPA) of 1979.

Section 106 of the NHPA and EO 11593 require federal agencies to take into account the effect of a project on any district, site, building, structure, or object that is included in, or eligible for, inclusion in the National Register of Historic Places (NRHP). The Carson NF uses the agreed upon standards in the Region 3 First Amended Programmatic Agreement (R3 First Amended PA) with the State Historic Preservation Office (SHPO) to comply with the federal requirements of the NHPA. Additionally, the ARPA of 1979 requires archaeological resources to be protected for future generations of Americans.

The issues typically relevant to cultural, historic, and traditional resources found within ski area management special use areas like TSV include potential impacts from ground-disturbing activities, such as construction and rehabilitation of lifts, trails, roads, parking areas, snowtubing, access, underground lines, and installation of erosion control features. New lifts, facilities and trails have a potential to increase public visitation to archaeological sites or Tribal sacred areas, or allow access onto neighboring lands.

Affected Environment

The Questa Ranger District archaeologist used the approved methodology for conducting cultural resource inventories on the Carson NF, as set forth in the 1986 Forest Plan. This Section 106 review effort consisted of a combination of office research, as well as field surveys and site visits. File and records reviews included a literature search of past reports and records, and state, district site and survey atlases, GLO and other land survey maps, and mining records at Taos County Clerk's Office. Field work included pedestrian surveys designed for this proposal in conjunction with past TSV management projects, which together have inventoried about 350 acres of the 1,268-acre TSV SUP area.

On the high-elevation ridges and valleys of the Hondo watershed, cultural resource sites consisting of chipped stone and stone tools are evidence of seasonal travel, habitation, hunting, and resource gathering by people who migrated to northern New Mexico several thousand years ago. Artifacts as early as Folsom points from Paleo-Indian times (9,000 years ago) have been discovered on the Questa Ranger District, as well as an abundance of chipped stone, grinding stones and pottery from later periods. These prehistoric sites show long-term human use and seasonal occupation, with the Jicarilla Apache remaining in the Taos Mountains until the end of the 19th century. Taos Pueblo in the Rio Grande Valley was established by 1300 AD, and became a major trade center along the old trail routes, with Pueblo people using the valley and mountains for hunting and gathering resources.

Historic-mining related sites dating from the mid 19th through mid 20th century are recorded throughout the Rio Hondo watershed, particularly in the Twining area at TSV. Scars, roads, waste piles, and standing ruins from mining operations and rotting remnants from mining boomtowns are hidden in the ridges, canyons, and along creeks. Miners and investors laid out streets and built log cabins for the town of Amizette in 1893, followed by the boomtown of Twining in 1894, which was abandoned by 1910. From the 1830s until the mid 20th century, thousands of sheep grazed the Antoine LeRoux land grant, including South Fork pasture and Hondo canyon. This became cattle livestock grazing after 1950. Development at TSV was renewed in the 1950s, with the opening of a new highway up Hondo Canyon.

Archaeologists have conducted sample and 100 percent surveys for ground-disturbing improvements at TSV since 1979. On July 27 and September 22, 2011, the Questa District Archaeologist visited project locations and completed a one hundred percent survey of 10 acres associated with the improvements, and recorded one new site. There are three cultural resource sites previously recorded within the TSV SUP area, and one site nearby.

There are two cultural resource sites recorded in TSV SUP area and one adjacent to TSV that are considered eligible or potentially eligible to the NRHP, and therefore suitable for mitigation from adverse effects according to NHPA.

Cultural and historic resources in TSV's SUP area and adjoining lands show the cumulative effects of natural and human impacts over time. Heavy snowfall, torrential thunderstorms, erosion, and forest growth have contributed to deterioration of sites, as have use and abuse by people who have visited the sites, often pulling apart historic log structures to build in a different location, or to burn in a campfire. However, recent field checks have determined that no eligible cultural resources sites are currently being adversely impacted by TSV operations.

Taos Ski Valley and Taos Pueblo

In addition to the Forest Service consultation process, TSV and the Taos Pueblo meet regularly to discuss current and future ski area operations and tribal concerns. Members of TSV and the Taos Pueblo have met to review the projects outlined in the 2010 MDP including those projects that are part of this Draft EIS. Several concerns were initially raised by the Taos Pueblo including summer hikers trespassing on Taos Pueblo land, avalanche blasting, and above treeline snowmaking infrastructure.

Environmental Consequences

The phase 1 improvement projects comply with the R3 First Amended PA provisions of Appendix A, Section I, "Undertakings Subject to Standard Consultation." The Forest Service and the SHPO agree that the projects have the potential to affect historic properties and will normally require consultation. The phase 1 improvements fall into two sections: (C) Permits, easements and right-of-way grants that authorize surface disturbance or have the potential to affect historic structures or traditional cultural properties; and (P) Trail construction. All of the proposed improvements requiring 100 percent pedestrian survey have been surveyed for cultural resources, with the exception of those found on slopes greater than 40 percent, which are excluded from survey as there is little potential to affect cultural resources on these steep slopes.

The proposed projects also comply with the R3 First Amended PA provisions of Appendix A, Section II, "Exemptions," where the FS and SHPOs agree that these classes of undertakings have predictable effects and a very low likelihood of affecting historic properties:

A. Permits, easements, rights-of-way, and leases that do not authorize surface disturbance or have the potential to affect historic structures or traditional cultural properties;

B. Activities where previous natural or human disturbance has modified the landscape so extensively that the likelihood of finding historic properties is negligible;

E. Maintenance of existing structural improvements that do not involve additional ground disturbance; and

Q. Activities not involving ground or surface disturbance.

Alternative 1 – No Action

Under alternative 1, the cultural resource sites within TSV SUP area would continue to be managed under the 1986 Forest Plan, resulting in no direct effects from these particular proposed activities.

Alternative 2 –Proposed Action

Alternative 2 includes new and realigned lifts, lift replacements, glading, resort access, and parking lot reconfigurations, a new snowtubing facility, snowshoe trail, a mountain bike trail, and the reconfiguration of a skier drop-off area. Proposed activities that have the potential to affect cultural resources and adjacent lands include parking lot reconfigurations and improved access to terrain throughout the SUP area.

The four previously recorded sites were identified outside of the individual project areas, and the newly recorded site would be avoided or protected from the proposed projects (refer to the project design criteria below). The three sites that are eligible or potentially eligible for listing would be avoided or otherwise protected from the phase 1 improvements.

With implementation of the project design criteria and best management practices (identified below) cultural resource sites potentially eligible to the NRHP and recorded in the project area would be avoided or protected from direct effects and proposed ground-disturbing activities as stipulated above and in the archaeological clearance report.

Design Features and Mitigations

1. Install orange safety fencing around designated archaeological sites to protect from ground-disturbing construction activities.
2. If undocumented historic and/or prehistoric properties are located during ground disturbing activities or planning activities associated with approved construction activities, they will be treated as specified in 36 CFR 800.11 concerning Properties Discovered During Implementation of an Undertaking.

No impact to tribal lands was identified as a result of Alternative 2. As previously discussed, improved access throughout the SUP area (primarily related to the Main Street Lift) initially

raised concern for trespassing onto area tribal lands. However, because the Main Street Lift would only operate during the winter ski season, the distance and topography between TSV and tribal lands would continue to discourage access from the TSV SUP area. Furthermore, TSV has committed to implementing a communication strategy for guests and resort operations that is designed to avoid future trespassing incidents. Finally, TSV clarified that the proposed actions are not anticipated to increase avalanche blasting in the Main Street area (this in-bounds area already receives routine avalanche control work by TSV ski patrol), and no above treeline snowmaking infrastructure is proposed. Taos Ski Valley plans to meet with appropriate members of the Taos Pueblo to further discuss on-going concerns with TSV operations and the 2010 MDP projects.

Alternative 3

Alternative 3 includes the following proposed projects: lift replacements (lifts 4, 5 and 7); new gladed areas (the Wild West and the Minnesotas glades); a new Mountain Bike Trail; and a new snowshoe trail. Under alternative 3, no projects have been identified as having potential impacts to cultural resources. However, if undocumented historic and/or prehistoric properties are located during ground disturbing activities or planning activities associated with approved construction activities, they will be treated as specified in 36 CFR 800.11 concerning Properties Discovered During Implementation of an Undertaking.

Cumulative Effects

Taos Ski Valley Past Development

Past development of TSV included clearing, grading, thinning, trail construction, summer lift operations, and infrastructure on approximately 450 acres of public lands throughout the 1,268-acre SUP area and adjacent private lands. Past development of the Village of Taos Ski Valley included construction of roads, residential, commercial and utilities, some of which razed the remaining historic features of Twining ghost town.

Taos Ski Valley thinned an area to create gladed area called the *North American Glade*. A second project, a traditional trail, approved to the southeast of *North American* is yet to be constructed. This expert trail would be approximately 9.7 acres in area. Taos Ski Valley operates Lift 1 in the summer to provide lift rides as well as on-mountain hiking terrain. Ongoing summer maintenance of ski area infrastructure includes lift and boundary maintenance, drainage management and trail upkeep, and guest service facility repair.

Taos Ski Valley 2010 Master Development Plan

New trails and replaced lifts, terrain and infrastructure projects are outlined in TSV's 2010 MDP, which was accepted by the Carson NF. Phase 2 projects include: the Summit Lift, Burrow Beginner Area, new trails, trail widening and grading, retaining walls, snow fences, vegetation management, and a mountain top restaurant. The 2010 MDP also includes vegetation management component. Although these projects have been accepted as goals for development and operation of TSV, site specific NEPA analysis would be required prior to implementation of any of the identified projects.

In summary, cultural resources sites within the TSV SUP have been protected from ski area activities through avoidance or other protection measures, contributing to a desired condition, although sites and properties will continue to naturally degrade over time. In addition, forest

growth will continue to contribute to structural, surface, and subsurface impacts to cultural sites, and increase risk from fire. Cultural sites and historic properties will continue to naturally degrade over time. Over the long-term, ski management area activities like thinning, glading, and trail construction may be beneficial to help protect historic properties and cultural sites from the devastating effects of wildfires and the associated suppression activities and subsequent erosion.

Irreversible and Irretrievable Commitment of Resources

No irreversible or irretrievable commitment of sites recorded, and considered eligible or potentially eligible to the National Register of Historic Places would occur as a result of any of the project alternatives.

Visual Quality

This visual quality analysis focuses on specific portions of TSV's SUP area where new projects are proposed that would alter the appearance of the area (i.e., West Basin Ridge, Kachina Peak, gladed areas, East Guest Drop-Off Area, and the Snowtubing Center). In general, the proposed Mountain Bike Trail, Adventure Center (snowshoe trails), lift replacements, and parking lot reconfiguration are not expected to meaningfully alter the visual characteristics of the SUP area, because they would have very little visual impact, are proposed in the existing developed base area, or entail replacing existing infrastructure.

Aside from within the ski area, the TSV SUP area is visible from limited vantage points along NM-150 and internal resort access roads in the immediate vicinity of TSV. Portions of the TSV SUP are also visible from the adjacent Wheeler Peak Wilderness. Almost the entire SUP area is visible from across the Hondo Canyon, on trails in the Columbine-Hondo Wilderness Study Area (WSA). The views from key points in Wheeler Peak Wilderness and the WSA are valued year-round by local hikers as well as visitors who expect to see and natural alpine settings (sensitivity level 1).

The potential aesthetic impacts of the proposed changes within the SUP area were considered in relation to the overall existing development and recreational theme of the resort. Analysis of visual resources of a landscape requires an evaluation of the project area and its ability to absorb the effects of both historic and ongoing human and natural change. Slope, natural vegetation types, and patterns, topography, and viewing distance are important factors in this analysis. The development of skier facilities, infrastructure, and developed trails on NFS and private lands within the ski area has occurred over the past 6 decades, with the area being managed as a winter recreation site. Given TSV's location and status as a developed ski area, it is reasonable to assume the majority of guests using the ski area and the developed base area expect their immediate surroundings to appear as such. However, these same people enjoy and value the pristine views of the mountains in the background.

Management of the Scenic Environment on National Forest System Lands

The Visual Management System (VMS) was adopted in 1974 as the primary scenery management direction by the Forest Service and was incorporated into the 1986 Forest Plan.[90] The VMS was developed to inventory and mange the visual resources of NFS lands. The visual management inventory consists of three steps: landscape character type, variety class, and sensitivity levels overlaid on distance from the viewer. These steps are combined and interpreted to develop Visual Quality Objectives (VQO).

Visual Quality Objectives and Landscape Character

An action can cause changes to visual resources that can be objectively measured. By assessing the existing scenic character of an area in terms of pattern elements (form, line, color and texture) and pattern character (dominance, scale diversity and continuity), it is possible to identify the

[90] Once the Carson NF's 1986 Forest Plan is revised, management of the scenic environment will be directed by the newer Scenery Management System (SMS). The Scenery Management System (SMS) was adopted in 1995 as the primary scenery management direction by the Forest Service. In brief, the SMS is a systematic approach for assessing scenic resources in a project area to help make management decisions on the project.

extent to which the scenic character would exhibit contrast with the landscape, or its converse—compatibility.

The 1986 Forest Plan establishes visual quality objectives for scenic resources. The acceptable limits of change of a particular area (e.g., Management Area, as defined in the 1986 Forest Plan) are the documented VQO, which serve as management goals for scenic resources. The VQOs for MA 16 – Recreation Sites are "retention" or "partial retention" adjacent to developed sites.[91]

- The retention VQO dictates that "activities may only repeat form, line, color, and texture which are frequently found in the characteristic landscape," meaning changes to the visual landscape resulting from proposed activities should not be immediately evident to the casual viewer.[92]
- The partial retention VQO allows activities to "introduce form, line, color, or texture which are found infrequently or not at all in the characteristic landscape, but they should remain subordinate to the visual strength of the characteristic landscape."[93]

In general, the scenic landscape of the TSV SUP area is characterized by rugged, forested mountains exceeding 11,000 feet in elevation interrupted by chutes, rock bands and valleys. This natural character is blended with a strong recreational character within the SUP. It is also important to note that the 1986 Forest Plan defines the characteristic landscape as including manmade features.[94]

Visual Management System Distance Zones

Viewing distance is important in determining how change is perceived across a landscape. Distance zones are divisions of a particular landscape being viewed, and are used to describe the part of a characteristic landscape that is being inventoried or evaluated.

- Foreground: This zone is usually limited to areas within 0.25 mile or 0.5 mile (not to exceed 0.5 mile) of the observer, but it must be determined on a case-by-case basis, as should any distance zoning. Generally, detail of landforms is more pronounced when viewed from within the foreground zone.
- Middleground: Alterations in the middleground (extending from the foreground zone to 3 to 5 miles from the observer) are less distinctive. Texture is normally characterized by the masses of trees in stands or uniform tree cover.
- Background: This zone extends from the middleground to infinity. Shape may remain evident beyond 10 miles, especially if it is inconsistent with other landscape forms. Beyond 10 miles, alteration in landscape character becomes obscure.

[91] USDA Forest Service, 1986

[92] USDA Forest Service, 1974

[93] Ibid.

[94] USDA Forest Service, 1986 p. 16 Recreation Sites – 4

Forest Plan Standards and Guidelines

The 1986 Forest Plan contains forest-wide standards and guidelines which apply to resources across the Carson NF.[95] No forest-wide standards and guidelines specifically apply to the scenery management of the TSV SUP area. Management Area 16 includes the following direction related to scenery management:[96]

- **Desired Future Condition**: In areas adjacent to the facilities, retain the form, line, color, and texture which are characteristic of the landscape (retention visual quality objective) or any activities and uses remain visually subordinate to the characteristic landscape (partial retention VQO).
- **Standards and Guidelines – Visual Quality**: Manage for the visual quality objective of retention or partial retention adjacent to developed sites. Use a definition of characteristic landscape which includes manmade features.

Taos Ski Valley's existing lift and trail network, all related infrastructure, maintenance, and guest operation buildings are consistent with MA 16 standards and guidelines. The characteristic landscape and ski trails within TSV's permit area are natural in appearance. Tree lines along the edges of ski trails are varied and undulated and islands of trees were purposely left in the middle of some trails. Cleared trails were reseeded immediately, resulting in successful revegetation. This has reduced the color contrast between trails and forested areas in the summer.

Affected Environment

Scenic Characteristics of the Taos Ski Valley Permit Area

Developed and undeveloped winter recreation dominates the sense of place at TSV and in the Village of Taos Ski Valley. The aesthetic landscape across private and NFS lands in the vicinity of TSV has been defined by recreation since the resort opened in 1955, with the development of trails, lifts, infrastructure, and skier facilities on NFS lands evolving since that time. Roughly 1,200 acres of skiable terrain have either been developed, or are accessible from TSV's lift network, on NFS and private lands. Upper portions of TSV's SUP include open bowls, unvegetated chutes, steeps, and rock bands like those found on Highline and West Basin ridges.

Vegetation cover throughout the SUP area varies, due to the broad range in elevation, slope aspect, and gradient. Plants that occur within the alpine zones (11,000 to 11,500 feet) and subalpine zones (9,000 to 11,500 feet) of New Mexico characterize the SUP area. Dominant tree species include Engelmann spruce, subalpine fir or cork-bark fir, and the dominant ground cover is whortleberry. The distinctive vegetation patterns typical of cut ski slopes contribute to the scenic character in the lower, forested portions of the permit area.

The elevation of the TSV base area and the Village of Taos Ski Valley is 9,207 feet. The summit elevation of Kachina Peak is 12,481 feet; however, the highest lift-served terrain from the top of Lift 2 is at 11,819 feet. The aspects of the slopes, varied terrain features, and roughly 3,000 feet of total vertical relief minimize the visibility of the ski area to drivers on NM-150 and residents and

[95] A *standard* is a course of action which must be followed; **adherence is mandatory**. A *guideline* is a preferred course of action designed to achieve a goal, respond to variable site conditions, or respond to an overall condition.

[96] USDA Forest Service, 1986 p. 16 Recreation Sites – 1

visitors within the Village of Taos Ski Valley. Only limited portions of the existing lift and trail network on north and east facing aspects of the "front side" (lifts 1, 2, 5, 6, and 8) can be perceived in the middleground distance zones by visitors to the Village of Taos Ski Valley. Views of some of the east facing, "back side" aspects of TSV (around lifts 4 and 7) are also available from limited portions of the Wheeler Peak Wilderness in the middleground distance zone.

Scenic Characteristics of the Proposed Project Areas

Proposed project areas are discussed separately from the SUP area, to provide the reader with specific information regarding the current visual characteristics of a proposed project area and how its visual characteristics may change if the specific project were implemented.

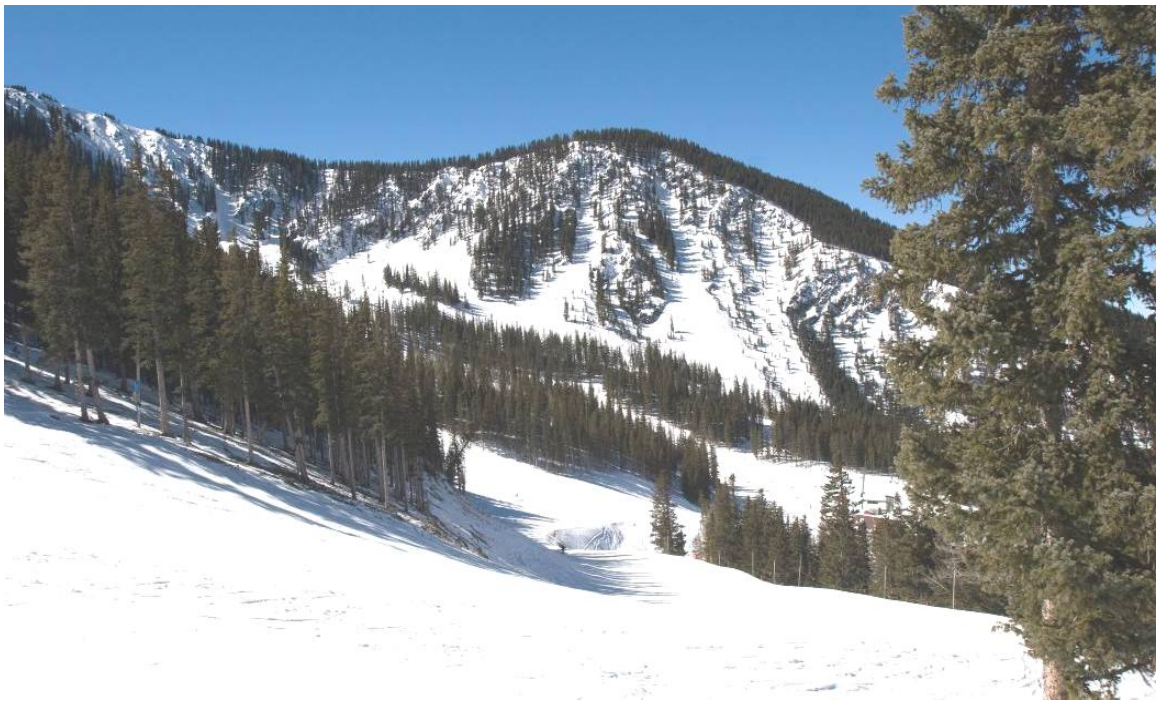

Figure 3. View of West Basin Ridge

West Basin Ridge and Wild West Glades

West Basin Ridge is just below tree line and contains steep chutes and large rock bands. These natural chutes and rock bands provide a textured view with vegetated areas interspersed throughout the chutes. The overall slope is comprised of a patchwork of trees and boulders in a series of small drainages and ridges. The drainages are highly susceptible to avalanche, evidenced by the absence of trees. Trees are relatively sparse, with Engelmann spruce being the dominant species. Tree stands tend to create linear patterns down the slopes.

West Basin Ridge is visible from within the SUP boundary as foreground to skiers/riders. West Basin Ridge is not visible from the adjacent Wheeler Peak Wilderness. Figure 3 depicts West Basin Ridge as viewed from near the top to Lift 1. It is a natural appearing bowl, when viewed (middleground) from key trails and the ridgeline across the canyon in the Columbine Hondo Wilderness Study Area.

The area proposed for the Wild West Glades is comprised of densely forested vegetation throughout the length of the proposed glades. The dominant species are cork-bark fir and Engelmann spruce, with some mortality in the smaller cork-bark fir. The proposed Wild West Glades would be on the "front side" facing north. This area is visible as middleground from portions of the TSV SUP area, and from the upper reaches of Gavilan Trail, across the canyon in the Columbine Hondo WSA. A short segment is also visible from NM-150.

Kachina Peak

Kachina Peak is defined by its large, north-facing open bowl, which provides a high alpine, exposed mountain aesthetic. Kachina Peak has been skied since TSV opened to the public in the 1950s, but no vegetation has been removed. The vegetation within this area is comprised of a variety of low-growing alpine plants. *Main Street* is the main run down the center of the bowl, with *Hunziker* on skier's right and *K5* through *K1* chutes on skier's left.

Figure 4 depicts Kachina Peak as viewed from *Japanese Flag*. Lift 4 is in the foreground. The north-facing aspect of the bowl within TSV's SUP area is visible from isolated portions of the Wheeler Peak Wilderness (figure 5). From the top of Wheeler Peak and the ridgeline north to Walter Peak, only the top of Kachina is visible. The north facing aspect of Kachina Peak bowl is visible across the valley from private residences and the upper reaches of the trails within Columbine-Hondo WSA that provide access to Gold Hill.

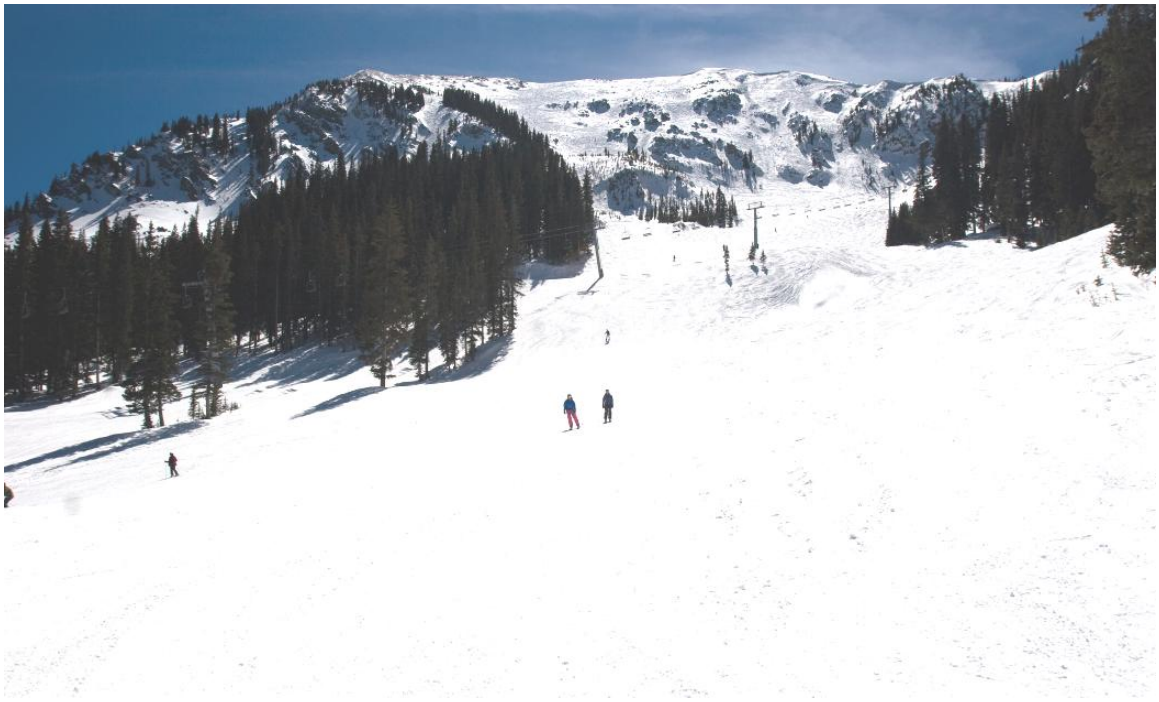

Figure 4. View looking up to Kachina Peak from Japanese Flag

Figure 5. Kachina Peak with Wheeler Peak in the background

Minnesotas Glades

Glades are forested areas throughout a ski area, either natural or purposefully thinned that provide varying levels of difficulty, depending on the tree density and slope angle. Examples of glades within TSV's developed terrain network include: *Sir Arnold Lund*, *North American Glade*, *Edelweiss Glade*, and *Jean's Glade*. These glades are within Lift 7 and Lift 1 pods. The 2010 MDP identified other opportunities for glades that are located on gentler pitches, with well-spaced trees suitable for lower level skiers and riders. When glades are purposefully thinned, the residual canopy often disguises the created openings so that there is little or no change in the texture of the tree stands when viewed as middleground. Figure 6 depicts the recently created *North American Glade*.

Figure 6. North American Glade

As depicted in figure 7, a notable feature of the area proposed for the Minnesotas Glades is the number of standing dead fir trees, which interrupt the color of the tree masses with large patches of brown. The vast majority of mortality is cork-bark fir and is the result of a combination of insect infestation and drought. The potential fire hazard from the extensive amount of dead debris in the canopy is a concern. The lower portion of the forested area proposed for the Minnesotas Glades is visible as foreground from within the SUP on the *Rubezehal* return trail (looking straight up the mountain). Since they are on an east facing slope, they also can be seen from limited places within the Village and on the Phoenix Road.

Figure 7. Area proposed for Minnesotas Glades

Resort Access

Proposed changes to the resort access would occur in the existing parking lot. Currently the lot consists of paved lanes separated by tree islands. The parking lot is adjacent to the developed infrastructure of the Village of Taos Ski Valley, on NFS lands. In its current configuration, the guest drop-off areas between the Guard House and the Pagoda on Sutton Place Road do not contribute to a sense of arrival for guests accessing the mountain, which is an important element of the guest experience. From the current drop-off area at the Pagoda guests are presented with views of building facades (including the rental shop and ski school) and parking lots rather than views of the lifts and ski slopes.

Figure 8. Proposed location for East Guest Drop-Off Area

Figure 9. Existing arrival experience at west drop-off area

Snowtubing Center

At the location of the proposed snowtubing runs, there is a band of riparian vegetation between the lower level of the parking lot and the Rio Hondo. The Village of Taos Ski Valley uses the riparian strip as an interpretive opportunity and as a pedestrian corridor to connect key facilities in the base area. The corridor contains a short, elevated boardwalk on the east end. The trail is known as the Nature Trail, dedicated to John Ramming. The trail provides occasional views of the Lift 3 slopes and offers an opportunity for guests to observe skiers and riders in the winter.

Environmental Consequences

Alternative 1 – No Action

Alternative 1 would not change or modify the visual quality of the SUP area. Developed and undeveloped portions of the permit area would continue to meet the VQO standards and guidelines as well as forest-wide prescriptions for scenic quality set forth in the 1986 Forest Plan.

Alternative 2 – Proposed Action

In the context of MA 16 – Recreation Sites, implementation of the proposed projects in alternative 2 would be consistent with the Carson Forest Plan and established VQOs for the SUP area. Table 2 in chapter 2 includes mitigation measures for Visual Quality that would be applied where appropriate, to keep any changes subordinate to the landscape character and natural appearance and meet the Partial Retention objective.

Under alternative 2, some incremental changes to the scenery can be expected; however, the changes would be most visible (foreground) from ski slopes and the base area developed facilities. Sensitive views from designated wilderness and wilderness study area are protected, by designing the Main Street Lift upper terminal to be located below the ridgeline on a natural bench.

West Basin Ridge and Wild West Glades

The proposed Ridge Lift would only be visible from within the ski area (primarily in the foreground view). This lift would be installed with minor vegetation removal (at the top terminal). Any created opening would be within the existing range of openings on the ridgeline. It is anticipated that thinning of vegetation to create the Wild West Glades would look natural, with some small openings, particularly from the middleground view. The remaining canopy cover would appear natural from across the canyon in the Columbine-Hondo WSA and from within the permit area. For a representation of what Wild West Glades would be anticipated to look like, refer to figure 6, which depicts the existing *North American Glade*.

Kachina Peak

The top of the proposed Main Street Lift would be located in a small recessed area on the north facing slope of Kachina Peak, roughly 20 feet below the summit. The location is not visible from Wheeler Peak, but can be seen from the ridge between Wheeler and Walter peaks, in Wheeler Peak Wilderness. The location is part of a large open slope with some textural relief, due to the rock outcrops and scattered tree islands. Viewing the slope as middleground (the view from all perspectives, except from the permitted ski slopes just below) and limiting the size of any improvements would keep any changes subordinate to the general landscape character. The

proposed Main Street Lift would be bottom drive, and only a tower supporting a bullwheel and a small lift operator/ski patrol building would sit at the top of the proposed lift. Natural topography, combined with the north-facing aspect of Kachina Peak within TSV's SUP area, would obscure most of (portions of the top terminal infrastructure may be slightly visible) the Main Street Lift from Wheeler Peak Wilderness. Limited vegetation removal associated with the placement of the bottom terminal would only be visible as foreground from the adjacent ski slopes.

The Main Street Lift would be visible from the base of Lift 4, and private land development nearby. The development at the base of Lift 4 has grown around the ski resort and guests, as well as residents expect to see ski area infrastructure in the landscape.

Minnesotas Glades

The Minnesotas Glades could, for the most part, be created by simply thinning out small, dead material. By removing mostly dead and dying trees, the Minnesotas Glades (which would be visible from the Phoenix Road on private land) would look natural and healthy. Figure 6 provides a view of the recently created *North American Glade* and offers a good representation of what Minnesotas Glades would look like.

Resort Access

Changes to improve access (i.e., the "sense of arrival") would be expected to be appreciated by guests of TSV. The proposed East Guest Drop-Off Area includes removal of 0.1 acre of trees at the drop-off point to accommodate turning radius of buses and shuttles, as well as 1.3 acres of trees in the tree islands adjacent to the existing parking levels to create additional parking to compensate for the loss of parking at the new drop-off location and for the access road. Since these areas are already developed for parking lots there would be no substantial change to existing conditions.

Snowtubing Center

The proposed Snowtubing Center on *Strawberry Hill* would be built near Lift 3 (half on private land and half on NFS lands). The private portion is a developed ski slope and has a developed recreational character. The proposed area is visible from the base area, the parking lot, the Nature Trail, and limited portions of the Village of Taos Ski Valley. The lower half of the tubing runs would cross the Rio Hondo and enter NFS lands in the riparian strip along the stream. There would be some loss (0.7 acre) of riparian vegetation, affecting the foreground view of the riparian area from the Nature Trail. The trail itself would be moved upslope along the parking lot to avoid the tubing runs in this area. However, since the existing trail location provides a spectator opportunity associated with ski area activities, that opportunity would be enhanced by adding the tubing runs. The change also meets Forest Plan standards since developed facilities are not considered an intrusion in recreation areas.

Alternative 3

Impacts to visual quality under alternative 3 are expected to be similar to certain aspects of alternative 1 and alternative 2. The proposed Wild West Glades, Minnesotas Glades, lift replacements, Mountain Bike Trail, and snowshoe trails would have the same visual quality effects as discussed under alternative 2. Not implementing the Main Street Lift, Ridge Lift,

Snowtubing Center, East Guest Drop-Off Area, and parking reconfiguration would have no effect on visual quality, as in alternative 1.

Cumulative Effects

Taos Ski Valley Past Development

Private land developed has evolved along with developed skiing at TSV since the resort was founded in 1955 (with one lift and one trail). Historic development on NFS lands at TSV has involved clearing of trails, grading, and construction of lifts, roads, and buildings. Changes in vegetative patterns and developed facilities are visible from NFS lands within the permit area, and numerous locations on private land in the Village of Taos Ski Valley. All of these earlier changes create the existing conditions described above. Kachina Peak is a naturally-open bowl (i.e., no vegetation removal has taken place here) and Highline Ridge and West Basin Ridge appear essentially as they always have—defined by steep, narrow chutes and gladed areas—although minimal vegetation removal has occurred in these areas to improve them from a recreational perspective.

Taos Ski Valley 2010 Master Development Plan

The 2010 MDP includes a roughly 7,000-foot long Summit Lift, which would replace Lift 1 and then utilize mostly open terrain to the top of Lift 2. The lower portion would replace a lift and then continue extending up to where Lifts 2 and 6 currently terminate. There would be little change to the existing visual quality objective, when viewed from the base area or from the Columbine-Hondo Wilderness Study Area across the canyon to the north.

The remaining projects from the 2010 MDP would contribute minor incremental impacts to the aesthetic environment within the SUP area. See appendix B for descriptions of future projects including grading and trail widening projects on select trails, new/replaced snowmaking infrastructure, and the construction of mountain bike trails. Effects from the addition of a mountain-top restaurant can be mitigated by placement of the new structure and by incorporating the architectural guidelines from the Forest Service Built Environment Image Guide (BEIG). All these projects could be mitigated to meet the existing VQO for the SUP area. Since alternatives 2 and 3 would not affect TSV's compliance with the Carson Forest Plan or established VQOs for the SUP area, they would not add to cumulative effects that degrade the scenery of the SUP area beyond existing levels of compliance, with the additional projects proposed in the 2010 MDP.

Development within the Village of Taos Ski Valley and Pattison Trust Lands

Private land development in the Village of Taos Ski Valley and on Pattison Trust lands have added roads and residential and commercial development in a primarily natural setting. Each of these developments contributes to the developed landscape that is visible in the immediate area of TSV. It is anticipated there would be new residential and commercial construction within the Village. The extent of this development would be limited by the Village of TSV Master Plan.[97] The present plan limits new construction to the existing platted land in the Village. New construction occurring adjacent to already developed areas, within the constraints of Village performance standards, would cumulatively increase the area of development on private land, with some

[97] Village of Taos Ski Valley, 2010

elements of alternatives 2 and 3. However, the area would be limited by the Village of Taos Ski Valley Land Use Plan and the development would remain subordinate to the landscape.

Since alternatives 2 and 3 would be consistent with the Carson Forest Plan and established VQOs for the SUP area, they would not add cumulative effects that degrade the scenery of the SUP area, beyond existing levels of compliance, with the additional development approved in the Village of Taos Ski Valley Land Use Plan.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road.

Additional developed terrain and infrastructure in previously undisturbed portions of the SUP area would represent small, irretrievable effects to visual resources, particularly from the Lift 4 base area perspective. The loss is associated with a low level of controversy since residences and businesses there expect to see ski area infrastructure. This commitment of the visual resource is not considered irreversible because facilities and lifts could be removed and, in time, the area could be reclaimed and revegetated, restoring its natural appearance.

Air Quality

The only Class 1 airshed located near TSV's SUP area is the Wheeler Peak Wilderness directly south and east of the SUP area. A Class 2 airshed, Latir Peak Wilderness, is located approximately 5 miles north of the SUP area.

Regulatory Direction

The goal for air quality on NFS lands in New Mexico is to manage emissions generated in or near federal land management areas such that air quality will meet the National Clean Air Act (CAA) and New Mexico Environment Department's Air Quality Bureau (AQB) requirements. Specific requirements can be found in the Forest Service Air Quality Program. In addition, the CAA requires each state to develop, implement, maintain and enforce an Air State Implementation Plan (SIP), with appropriate air pollution control regulations and strategies, to ensure that state air quality meets the National Ambient Air Quality Standards (NAAQS) established by the EPA. National Ambient Air Quality Standards for particulate matter (PM_{10}) and the Prevention of Significant Deterioration (PSD) Total Suspended Particulate (TSP) increment for Class 1 and 2 areas must be met (see table 12).

Forest Service direction regarding air resources is found in the 1986 Forest Plan. No specific air quality related standards or guidelines have been promulgated for MA 16; however, Forest-wide standards require that management activities "…be planned so that air quality will be equal to or better than that required by the applicable federal, state and/or local standards or regulations."[98]

Applicable Air Quality Regulations

Federal

The CAA was enacted in 1955, but it contained few requirements for reducing air pollutant emissions. It was amended numerous times from 1963 through 1990 to address reductions in vehicular and stationary source emissions and to establish national air pollution concentration limits. It also established several programs, including: NAAQS, which limited air concentrations to protect public health and welfare; the New Source Performance Standards, which set emission standards for major sources; and the SIP procedures, which were designed to bring areas that exceeded NAAQS levels (non-attainment areas) to within the standards.

Table 12 lists the National Ambient Air Quality Standards.

Table 12. National ambient air quality standards for criteria pollutants

Pollutant	Primary Standards[a]	Averaging Times	Secondary Standards
Carbon Monoxide	9 ppm (10 mg/m3) 35 ppm (40 mg/m3)	8-hour[b] 1-hour[b]	None None
Lead	0.15 µg/m3 1.5 µg/m3	Rolling 3-month Average Quarterly Average	Same as Primary Same as Primary

[98] USDA Forest Service, 1986

Table 12. National ambient air quality standards for criteria pollutants

Pollutant	Primary Standards[a]	Averaging Times	Secondary Standards
Nitrogen Dioxide	0.053 ppm (100 µg/m3) 0.100 ppm	Annual (Arithmetic Mean) 1-hour[h]	Same as Primary
Particulate Matter (PM) PM10 PM2.5	 150 µg/m3 15.0 µg/m3 35 µg/m3	 24-hour[bc] Annuald (Arithmetic Mean) 24-hour[e]	 Same as Primary Same as Primary Same as Primary
Ozone	0.075 ppm (2008 std) 0.08 ppm (1997 std)	8-hour[g] 8-hour[f]	Same as Primary Same as Primary
Sulfur Dioxide	0.03 ppm 0.14 ppm	Annual (Arithmetic Mean) 24-hour[b] 3-hour[b]	0.5 ppm (1300 µg/m3)

[a] ppm = parts per million, µg/m3 = micrograms per cubic meter, mg/m3 – milligrams per cubic meter
[b] Not to be exceeded more than once per year.
[c] 3-year average of the weighted annual mean PM10 concentration at each monitor within an area must not exceed 50 µg/m.
[d] 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m.
[e] 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 65 µg/m.
[f] 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
[g] 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm.
[h] 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm
Source: U.S. Environmental Protection Agency, 2009

The CAA designates two different air quality areas that receive different levels of protection. Class 1 areas generally include national parks, federally-designated wilderness areas that are in excess of 5,000 acres and that were created prior to 1977, national monuments, national seashores, and other areas of special national or regional value. Class 1 designation warrants the highest level of protection afforded to an area. Class 2 designation typically applies to non-Class 1 areas. The Wheeler Peak Wilderness (adjacent to the SUP on the east and south) is a Class 1 airshed, as is the Pecos Wilderness, located approximately 30 miles to the southwest. The Latir Peak Wilderness is a Class 2 airshed located approximately 5 miles to the north.

Class 1 and 2 areas are either designated as attainment, non-attainment, or unclassifiable areas. Unclassifiable designations apply where pollution is not anticipated to exceed national standards and where insufficient information is available to either substantiate or reject this assumption. Unclassified areas generally have little, if any, industrial development and comparatively sparse

populations. The low likelihood of air quality problems makes these areas a lower priority for expensive monitoring programs.

In addition to the NAAQS discussed above, the EPA has promulgated regulations to protect and enhance air quality. The PSD regulations are intended to help maintain good air quality in areas that attain the national standards and to provide special protections for national parks, federally designated wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historical value.[99] These regulations stipulate that new sources must not cause a decline in ambient air quality and must use best available control technology to limit emissions.

Prevention of Significant Deterioration permits are required for, "major emitting facilities" which emit, or have the potential to emit, 100 tons or more per year of any air pollutant.[100] Environmental Protection Agency regulations specifically list the sources that are considered "major emitting facilities"—this list does not include ski areas.[101] However, the regulations note that the term "major emitting facilities" also includes "any other source with the potential to emit 250 tons per year or more of any air pollutant."[102] A PSD permit is not required for TSV because ski areas are not classified as stationary sources and TSV does not have the potential to emit over 250 tons of any regulated air pollutant.

In an effort to eliminate or minimize the severity and number of exceedances of the NAAQS and to achieve expeditious attainment of these standards, the EPA promulgated the Conformity Rule in 1993. Conformity regulations apply to federal actions and environmental analyses in non-attainment areas completed after March 15, 1994. The conformity regulations do not apply to Taos County or to the TSV area because they are classified as attainment areas or as unclassifiable for all criteria pollutants.

Mobile Source Air Toxics Regulations

As stated in 40 CFR Parts 59, 80, 85 and 86 Control of Hazardous Air Pollutants from Mobile Sources:

Mobile source air toxics (MSATs) are compounds emitted from highway vehicles and non-road mobile equipment (e.g., construction equipment). Some of these toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. The EPA has identified six priority MSATs: benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene.

The EPA has issued a number of regulations that will significantly decrease MSATs by requiring the use of cleaner fuels and cleaner engines. The MSAT regulations were issued under the authority in Section 202 of the Clean Air Act. In its regulations, EPA examined the impacts of existing and newly promulgated mobile source control programs, including the reformulated gasoline program, national low emission vehicle standards, Tier 2 motor vehicle emissions

[99] 42 USC 7470-7479

[100] 42 USC 7475[a] and 7479[1]

[101] 42 USC 7479[1]

[102] Ibid.

standards, gasoline sulfur control requirements, proposed heavy-duty engine and vehicle standards, and on-highway diesel fuel sulfur control requirements.[103]

State

The EPA retains oversight authority but has delegated enforcement of the CAA to the states. In New Mexico, the Air Quality Bureau (AQB) of the New Mexico Environment Department (NMED) has the authority and responsibility to enforce air quality regulations and standards, with the exception of tribal land and Bernalillo County. Tribal land is subject only to federal regulatory requirements, and Bernalillo County has been delegated authority by the EPA to operate an air quality program separate from the state.

The state is required by the EPA to develop and administer air pollution prevention and control programs; state standards must be either the same as, or more stringent than, federal CAA standards. In New Mexico air quality regulations are provided in the New Mexico Administrative Code (NMAC) Title 20, Chapter 2. These regulations establish state ambient air quality standards (NMAAQS) that are equal to, or more stringent than, the NAAQS set forth by the EPA. In addition to the criteria pollutants covered by the NAAQS, the state has promulgated ambient air quality standards for Total Suspended Particulate (TSP), hydrogen sulfide, and added a 24-hour NO_2 standard. New Mexico also requires that all pollutant concentrations are expressed in parts per million (ppm) and are adjusted for altitude and temperature at the measurement location.

Affected Environment

Climate

Taos County has a semi-arid, continental climate. Summer days are dry and sunny, except for frequent afternoon thunderstorms. Winter days are often cold, with snowfall common but rarely lasting long. Average summer temperatures range from the mid to upper 60s (F) during the daytime to the 40s at night. Winter extremes at TSV vary between -20° (nighttime) and 40°F (daytime). Average precipitation levels are between 34 and 40 inches, approximately half due to summer rain and the other half from winter snow. Annual snowfall at TSV is approximately 300 inches, where the elevation is 9,207 feet.

Because average wind direction as measured at TSV is predominantly from the south, it is unlikely that any emissions generated directly or indirectly by TSV's operations (e.g., grooming equipment, emissions associated with heating and cooking fuels, snowmobiles, and guest vehicles) currently affect the Wheeler Peak Wilderness. Although the Latir Peak Wilderness is located north of TSV, local topography, meteorological conditions and distance from the ski resort make it unlikely that TSV's operations would have any effect on this airshed.

National Ambient Air Quality Standards Pollutants

Taos County has not monitored, and is not currently monitoring, SO_2, CO, O_3, Pb, or NO_2. It is believed that the probability of these pollutants becoming an impediment to attainment is unlikely due in part to the absence of major air emission sources in the region. This, combined with the expense of monitoring, has made it impracticable to oversee these pollutants. The closest ambient pollutant monitoring site is located at the Taos fire station. Parameters measured at the site are

[103] 40 CFR 59, 80, 85 and 86

PM_{10}, continuous $PM_{2.5}$ and meteorology (e.g., wind, temperature). Pollutants recorded at the site are typically wind-blown dust and residential wood smoke. At times, smoke from large fire events is also recorded. Data collected at this site for the previous year indicates that air quality in Taos County is in compliance of state and federal annual arithmetic mean standard for $PM_{2.5}$.[104]

In December 2006 EPA revoked the PM_{10} annual standard due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution. Before its revocation, the level of the annual standard was 50 micrograms per cubic meter of air ($\mu g/m^3$) of air.[105] At the time of this analysis, PM_{10} data from the NMED Taos monitoring site was unavailable. Regardless, it is probable that Taos County would continue to be classified as an attainment area for all monitored criteria pollutants and no additional air quality issues would be anticipated. Incremental increases in emissions would be unlikely to violate PSD regulations for criteria pollutants.

Greenhouse Gas Emissions and Carbon Dioxide

Emissions which contribute to climate change are called greenhouses gases (GHG), as they allow more solar radiation in at the upper atmospheres and trap heat in the lower atmosphere. The primary GHGs are carbon dioxide (CO_2), O_3, methane (CH_4), and nitrous oxide (N_2O). Natural sources of CO_2 occur within the carbon cycle where billions of tons of atmospheric CO_2 are removed from the atmosphere by oceans and growing plants, also known as “sinks,” and are emitted back into the atmosphere annually through natural processes also known as “sources.”

Greenhouses gases discussions generally focus on CO_2, as it constitutes approximately 85 percent of all GHG emissions worldwide. Within the United States, fossil fuel combustion accounted for approximately 94.1 percent of CO_2 emissions in 2008. The largest source of these CO_2 emissions was from the burning of fossil fuels such as coal, oil and gas in power plants, automobiles, industrial facilities, and other sources.[106] The transportation sector directly accounted for about 28 percent of total United States GHG emissions, making it the second largest source of GHG emissions, behind electricity generation (34 percent). Globally, approximately 30,377 Teragrams (Tg) of CO_2 (1 teragram = 1,000,000 metric tons) were added to the atmosphere through the combustion of fossil fuels in 2008, of which the United States accounted for about 19 percent.[107]

Greenhouses Gases Contribution of Taos Ski Valley Operations

It is not currently possible to accurately discern the effects of TSV from the effects of all other GHG sources worldwide, nor is it expected that attempting to do so would provide a practical or meaningful analysis of project effects. However, by developing assumptions related to traffic created by guests and accessing facilities at TSV it is possible to estimate the GHG emitted by existing vehicular traffic produced by visitors accessing facilities at TSV during the winter operating season. The assumptions were related to the origin of guests, and the number of guests who utilize lodging. For example, the majority (roughly 73 percent) of TSV’s skiers and riders are destination guests who travel to the resort from across the Rocky Mountain region and nation, staying for multiple days. Of this majority, roughly 25 percent stay at TSV, 30 percent stay in the Town of Taos, and 18 percent stay elsewhere within Taos County. The remaining minority

[104] New Mexico Environment Department, 2011

[105] US EPA, 2010

[106] Ibid.

[107] US Energy Information Administration, 2009

(27 percent of TSV's guests) are day skiers and riders who reside in the Town of Taos or within driving distance to the resort form across the northern New Mexico region.[108] The detailed quantification is located in the Project File.

From Albuquerque International Sunport (ABQ), guests typically either use a shuttle service or rent a car for the approximately 2.5-hour drive (135 miles) to the mountains. Many destination guests stay within the Town of Taos or at lodging adjacent to TSV and only drive to and from the resort at the beginning and end of their vacation. It is acknowledged that other sources of GHG emissions are present at TSV (e.g., grooming equipment, emissions associated with heating and cooking fuels, and snowmobiles); however, the majority of GHG emissions are produced by vehicle trip generation specific to the use of the ski area.

Discussed above, GHG emissions include a variety of compounds, most notably CO_2, CH_4, and N_2O. However, for on-road tailpipe emissions, CO_2 is by far the most significant contributor to GHG emissions. For purposes of comparing GHG emissions, the overall GHG emissions associated with TSV's existing guests are assumed to consist entirely of CO_2. The CO_2 emissions were calculated from the fuel usage of vehicles traveling to and from TSV, based on the average fuel economy data (i.e., miles per gallon of fuel) published by the EPA.[109] Since not all visitors to TSV stay overnight, a percentage of these visitors were assumed to travel round-trip each day from the northern New Mexico Region with an average daily round trip of 100 miles. The CO_2 emission factors (e.g., CO_2 emitted per gallon of gasoline burned) were then applied to the calculated total fuel usage to get the CO_2 emissions emitted from motor vehicles traveling to utilize TSV facilities. The detailed quantification is located in the Project File.

Taos Ski Valley has not exceeded 300,000 annual visits since the 1997/98 season, and since that time, it has averaged approximately 222,000 annual visits over 130 operational days. This is compared to a 10-year average of 295,000 annual visits in the 1990s, (representing a 25 percent decline in visitation between the 2 decades). This air quality analysis utilizes the above assumptions and the 10-year average annual visitation of 224,484 (see table 4 in the recreation section) to determine the baseline air quality contributions of TSV under the Existing Condition.

It is estimated that GHG emissions currently generated by TSV visitors contribute approximately 3,984.8 metric tons CO_2 equivalent (CO_2e) during an average season, or approximately 30.7 metric tons CO_2e/day, to the local and regional environment.[110] For clarity, this calculation includes motor vehicle emissions generated by TSV's guests as they drive from the Albuquerque metropolitan area or other origination points to visit TSV.

The average fuel economy was based on the EPA average for passenger cars and light duty trucks. The assumed fleet average was 20.4 miles per gallon.[111] It is important to note that future fleet-

[108] Information provided by TSV management.

[109] EPA Office of Transportation and Air Quality developed *Emission Facts: Average Carbon Dioxide Resulting from Gasoline and Diesel Fuel, 2005*, to ensure consistent assumptions and practices in the calculation of emissions of greenhouse gases from transportation and mobile sources. It is intended to be used as a reference for estimating emissions from mobile sources. Based on this fact sheet, a gallon of diesel fuel emits approximately 22.2 lbs CO_2. A gallon of gasoline emits approximately 19.4 lbs CO_2.

[110] "CO_2e is a metric used to compare the emissions from various greenhouse gases based upon their global warming potential." (EPA, 2011)

[111] In 2007, the weighted average combined fuel economy of cars and light trucks combined was 20.4 miles per gallon. (FHWA, 2008)

average fuel economy will improve as new Corporate Average Fuel Economy (CAFE) standards are enacted. The Energy Independence and Security Act signed into law on December 19th, 2007, mandates a 40 percent increase in fleet-average fuel economy by 2020, equal to 35 miles per gallon.[112]

Environmental Consequences

Greenhouse Gas Emissions

Because greenhouse gases from vehicle emissions mix readily into the global pool of greenhouse gases, it is not currently possible to accurately discern the effects of the TSV's operations under alternative 1, 2 or 3 from the effects of all other greenhouse gas sources worldwide, nor is it expected that attempting to do so would provide a practical or meaningful analysis of project effects. Currently, the Forest Service does not have a standard tool for measuring greenhouse gas emissions. However, the EPA has provided guidance on how to calculate GHG emissions related to mobile sources, this guidance was used to determine the impact of the anticipated increase in vehicle trips associated with TSV's operations. It is important to note that it is impossible to measure the incremental cumulative impact on global climate from emissions associated with TSV's existing and planned operations and activities.

For purposes of this analysis the estimated GHG emissions and increase in motor vehicle traffic are based on projected visitation estimates at TSV post implementation, by alternative (for more information on visitation projections, refer to the recreation section in chapter 3).

Based on the assumptions described above, the estimated GHG emissions generated by TSV visitors for the action alternatives are presented below in table 13.

Table 13. CO_2e generated by alternative post implementation

	Average Daily Visitation (guests)	Average Daily Metric Tons CO_2e*	Annual Metric Tons CO_2e*	Percent Change CO_2e over Existing Condition (%)
Existing Conditions	225,000	30.7	3,984.8	N/A
Alternative 1	225,000	30.7	3,984.8	0
Alternative 2	255,000	34.8	4,526.5	13.6
Alternative 3	225,000	30.7	3,984.8	0

* The ratio of carbon dioxide emissions to total emissions (including carbon dioxide, methane, and nitrous oxide, all expressed as carbon dioxide equivalents) for passenger vehicles was 0.977.
Source: EPA, 2009

Alternative 1 – No Action

Under alternative 1, no new projects would be implemented at TSV. Greenhouses gases emissions and air quality impacts would be associated with maintaining existing operations, including the

[112] Pub. L. 110 – 140 Energy Independence and Security Act of 2007

lifts and ski trail network and associated infrastructure. No project related changes would occur to the current trends in air quality. Ongoing commercial and residential growth within Taos County would continue independently of activities at TSV. There would be no new projects approved under alternative 1, therefore no new short-term construction related greenhouse gases would be emitted. It is likely that TSV's annual visitation would continue to hover around 225,000 in the short-term, with further declines in the long-term as infrastructure continues to age and destination skiers/riders look elsewhere to resorts that have invested in projects that substantively improve their recreational offerings and experience.

In total, guests visiting TSV under alternative 1 are estimated to contribute approximately 3,984.8 metric tons of CO_2e annually or 30.7 metric tons of CO_2e daily (refer to table 13) as in the Existing Condition. Due to existing regulations, climate, and topography, future exceedances of NAAQS would be unlikely. It is probable that Taos County would continue to be classified as an attainment area for all monitored criteria pollutants and no additional air quality issues would be anticipated. Incremental increases in emissions would be unlikely to violate PSD regulations for criteria pollutants.

Taos Ski Valley's future operations under alternative 1 would be extremely unlikely to adversely affect air quality in the Wheelers Peak and Latir Peak Wilderness areas. Upper level winds are predominantly from the south, and TSV is downwind from the Wheeler Peak wilderness (a Class I airshed). Although the Latir Peak Wilderness is located north of TSV, local topography, meteorological conditions and distance from the ski resort make it unlikely that TSV's operations would have any effect on this airshed.

Beyond the scope of this project, new CAFE vehicle standards will continue to make progress in introducing more fuel efficient vehicles to reduce greenhouse gas emissions and help reduce carbon monoxide and ozone pollutants in the project area.

Due to existing regulations, climate, and topography, future exceedances of NAAQS would be unlikely. It is probable that Taos County would continue to be classified as an attainment area for all monitored criteria pollutants and no additional air quality issues would be anticipated. Incremental increases in emissions would be unlikely to violate PSD regulations for criteria pollutants.

Alternative 2 – Proposed Action

Long-Term Air Quality Effects

No emissions permits would be required for implementation of alternative 2. No long-term air quality impacts are expected at TSV or adjacent NFS or Taos County lands as a result of alternative 2. Effects to air quality associated with projects occurring on public lands would not result in any changes to existing air quality effects. The impacts of public lands projects are expected to be within the acceptable standards for both particulate matter and visibility.

Under alternative 2, it is reasonable to assume that lift serving TSV's high elevation terrain would be accompanied by a short-term "spike" in annual visitation, followed by a long-term, more modest, sustained increase. Based on (but not limited to) recent lift/terrain projects at other western resorts, and resulting increases to annual visitation, proposed new high alpine lifts at TSV could generate an initial spike of between 15 and 20 percent in annual visitation for the first 3-to-5 years. Alternative 2 has the potential to increase annual visitation from the current average of

225,000 to approximately 270,000 (or more) in the short-term. In the long-term, however, it is anticipated that this number would likely level out to a more modest increase between 250,000 and 260,000 guests per year (a 10 to 15 percent increase).

Using a 130-day operating season, average annual visitation at TSV is projected to increase by approximately 30,000 skier visits over alternative 1. This increase would be accompanied by a corresponding increase in vehicular traffic and GHG emissions from mobile sources. Under alternative 2, GHG emissions generated from mobile sources as guests visit the resort is anticipated to be approximately 4,526.5 metric tons CO_2e annually, or 34.8 metric tons CO_2e daily, representing an increase of 13.6-percent over existing conditions and alternative 1 (refer to table 13). For comparison, the EPA estimates that the average annual household emissions in the United States are approximately 11.3 metric tons CO_2e.[113]

No long-term effects to air quality in the Taos County basin are expected to be measureable. Likewise, alternative 2 is not anticipated to result in violations of state or federal air pollution control laws and regulations or to have an appreciable effect on air quality.

Short-Term Air Quality Effects

Implementation of alternative 2 would comply with 40 CFR Part 85 entitled "A Control of Air Pollution from Mobile Sources." Fugitive dust emissions are generally the largest source of PM_{10} during construction. Emissions depend on soil type, soil moisture content, and the total area of soil disturbance. Much of the fugitive dust generated by construction activities consists of relatively large-sized particles, which generally settle within a short distance of the construction site. Dust emissions attributable to construction activities are not considered significant because they would be temporary and would not occur within a designated PM_{10} or $PM_{2.5}$ non-attainment area.

Trees felled during implementation of alternative 2 would be disposed of via a combination of removal of merchantable timber or on-site burning, if/when appropriate. Although there would be localized short-term air quality effects due to the burning of wood debris, the effects are anticipated to be limited in scale and would cease once the debris has been completely incinerated. Any necessary local (Village of Taos Ski Valley and State of New Mexico Air Quality Bureau) burn permits would be obtained prior to disposal of the wood debris.

Construction equipment powered by internal combustion engines would generate NO_2, reactive organic gases, odors, SO_2, CO, and PM_{10}. Detailed construction schedules and knowledge of the type, number, and duration of heavy equipment operations are necessary to accurately quantify construction-related emissions. This information is not yet available for this Draft EIS. However, air quality impacts caused by construction equipment emissions would be short-term, occurring only when construction activities are taking place, and would have a minor impact on overall air quality. Additionally, mitigation measures would be employed to remain in compliance with local, state, and federal air quality regulations, particularly during construction to minimize impacts to air resources (table 2 in chapter 2).

[113] Environmental Law Resource, 2010

Alternative 3

Long-Term Air Quality Effects

Alternative 3 does not include the types of projects that would be anticipated to increase annual visitation at TSV in a meaningful or quantifiable way. Replacement of lifts 4, 5 and 7 are likely not enough, in and of themselves, to stimulate additional visitation at TSV because these are necessary upgrades to infrastructure that is already in place. Therefore, under alternative 3, annual visitation (and related traffic) would be expected to closely resemble alternative 1—continuing to hover around 225,000 in the short-term, with probable further declines in the long-term as infrastructure continues to age.

Therefore, because no increases in visitation are anticipated, the long-term effects to air quality under alternative 3 are anticipated to be as described in alternative 1.

Short-Term Air Quality Effects

Implementation of alternative 3 would comply with 40 CFR Part 85 entitled "A Control of Air Pollution from Mobile Sources." Fugitive dust emissions are generally the largest source of PM_{10} during construction. Emissions depend on soil type, soil moisture content, and the total area of soil disturbance. Much of the fugitive dust generated by construction activities consists of relatively large-sized particles, which generally settle within a short distance of the construction site. Dust emissions attributable to construction activities are not considered significant because they would be temporary and would not occur within a designated PM_{10} or $PM_{2.5}$ non-attainment area.

Trees felled during implementation of alternative 3 would be disposed of via a combination of removal of merchantable timber or on-site burning. Although there would be localized short-term air quality effects due to the burning of wood debris, the effects are anticipated to be limited in scale and would cease once the debris has been completely incinerated. Any necessary county burn permits would be obtained prior to disposal of the wood debris.

Construction equipment powered by internal combustion engines would generate NO_2, reactive organic gases, odors, SO_2, CO, and (discussed above) PM_{10}. Detailed construction schedules and knowledge of the type, number, and duration of heavy equipment operations are necessary to accurately quantify construction-related emissions. This information is not yet available for this Draft EIS. However, air quality impacts caused by construction equipment emissions would be short-term, occurring only when construction activities are taking place, and would have a minor impact on overall air quality. Additionally, mitigation measures would be employed to remain in compliance with local, state, and federal air quality regulations, particularly during construction to minimize impacts to air resources (table 2 in chapter 2).

Cumulative Effects

Development within the Village of Taos Ski Valley and Pattison Trust Lands

Past, present and future residential and commercial growth within Taos County and the Village of Taos Ski Valley (and the associated increased population and traffic levels) is more likely to impact air quality than impacts associated with proposed projects at TSV. Private land development in the area such as the Village of Taos Ski Valley and the Pattison Trust have added roads, residential and commercial development in a primarily natural setting. These developments

typically utilize wood stoves for heat these have the largest impact on visibility. It is anticipated that the Village would continue grow in the future; however there are no specific proposals at this time that can be defined or analyzed. Future development (which are not appropriate for septic systems) may be limited by the Village wastewater treatment facility.

No long-term, cumulative effects to air quality in the Taos County basin are expected. Likewise, past, present and reasonably-foreseeable future projects are not anticipated to result in violations of state or federal air pollution control laws and regulations or to have an appreciable effect on air quality.

Irreversible and Irretrievable Commitment of Resources

No irreversible and/or irretrievable commitments of resources in relation to air quality have been identified in association with either alternative analyzed in this document.

Water, Wetlands and Soils Resources

The scope of this analysis includes streams, wetlands and soils with potential to be impacted by any of the proposed projects. In addition, this analysis includes an assessment of stream health conditions within the Headwaters of Rio Hondo watershed.

Forest Plan Direction

The 1986 Carson Forest Plan includes management direction for Riparian Areas, Watershed Resources, and Recreation Sites on NFS lands.[114] The applicable forest wide standard and guidelines are included here for reference.

Watershed

- **Best Management Practices:** Minimize the effect of planned activities on the water and soil resources through the use of best management practices (BMPs).
- **Maintain Improvements:** Maintain soil and water improvement projects.

Riparian Areas

- **Sediment:** Activities that generate sediment will be avoided during fish spawning.
- **Stream Flow:** Manage all existing perennial streams for favorable conditions of flows for in-stream and downstream uses.
- **Floodplain and Wetlands:** Any projects prepared in the floodplain/wetlands will be subject to an analysis which evaluates them in context of Executive Orders 11988 and 11990.
- **Roads:** Locate new roads outside of the riparian type. If new roads are to be built, then erosion control measures utilizing BMPs (i.e., buffer zones, sediment catch basins, seasonal road closures, etc.) will be included.
- **Crossings:** Align crossings so that the minimum possible area is affected. Do not align roads to pass through the long axis of narrow riparian strips. Schedule construction activities during low water periods. Minimize road clearing widths. Provide fish passage in all perennial stream crossings.

Management Area 16 – Recreation Sites

Specific to the project area, for Management Area 16 – Recreation Sites, the applicable standards and guidelines stipulate:

Ski Areas

- Administer the existing ski areas in accordance with the direction in the Master Development Plan for each area.
- Plan and monitor watershed treatments and conditions.
- Conduct administrative studies relating to watershed management.

[114] USDA Forest Service, 1986c

In addition, the Forest Service reviews soil mapping unit characteristics to determine the extent of impacts to the soils resource.

Clean Water Act

The Clean Water Act (CWA) regulates discharges of pollutants into waters of the United States and waters that do not comply with water quality standards. Under section 303(d) stream reaches that do not comply with standards are listed as impaired surface waters and states are required to identify total daily maximum loads (TMDL) for pollutants in which the stream is not in compliance, to achieve load reductions. Streams within the project area that are listed as impaired and/or have TMDL specified have been discussed in detail below.

U.S. Army Corps of Engineers Direction

The U.S. Army Corps of Engineers Wetlands Delineation Manual, hereinafter referred to as 1987 Manual, and the Interim Regional Supplement, defines wetlands as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."[115] Wetlands generally include swamps, marshes, bogs, and similar areas. Activities within and near these areas, including tree removal, culvert installation, grading, and changes in runoff regimes may affect the ecological functions of wetland resources. Impacts to wetlands are regulated by Section 404 of the CWA, and such activities would require issuance of a permit from the U.S. Army Corps of Engineers (USACE).

Executive Order 11988

Executive Order (EO) 11988 provides direction for floodplain utilization including managing floodplains to reduce the impact on human safety and property as well as preserving the natural values of floodplains. EO 11988 requires federal agencies to reduce the risk of floodplain loss, analyze potential effects of modifications or occupancy of floodplains and develop measures to minimize impacts as appropriate. The direct and indirect environmental consequences section identifies how the projects have been implemented to avoid and minimize construction within the floodplain.

Executive Order 11990

Additional direction regarding wetlands management for the USACE and Forest Service is provided by EO 11990 – Protection of Wetlands. Presidential EO 11990 requires federal agencies to avoid to the extent practicable, long- and short-term adverse impacts associated with the destruction or modification of wetlands. More specifically, the Order directs federal agencies to avoid new construction in wetlands unless there is no reasonable alternative. The Order states further that where wetlands cannot be avoided, the proposed action must include all practicable measures to minimize harm to wetlands. As required by EO 11990 and the CWA, avoidance and minimization measures must be considered through the planning process. Therefore, the direct and indirect environmental consequences also identifies planning constraints with regard to terrain development.

[115] U.S. Environmental Laboratory, 1987; U.S. Environmental Laboratory, 2010

Affected Environment

This analysis is divided into three resource headings: streams, wetlands and soils. Project disturbance areas were surveyed for streams, wetlands and evidence of soil erosion. Streams and wetlands that were identified during the field surveys were delineated and are included in this analysis. Soils were reviewed within the project disturbance area for signs of overland flow and erosion, and this data are included in the analysis. Additionally, Forest Service data for streams, wetlands and soils were relied on for areas outside those locations that could experience direct project impacts.

Streams

The headwaters of the Rio Hondo are in the Sangre de Cristo Mountains of New Mexico. According to Forest Service data, over 68 miles of streams occur within the headwaters of the Rio Hondo watershed (part of the greater Upper Rio Grande watershed). These streams are comprised of named and unnamed tributaries to the Rio Hondo, which runs along the base of TSV. Streams within the Upper Rio Grande watershed are generally narrow, with rocky bottoms and woody riparian vegetation. Stream widths range from 2 feet (unnamed tributaries) to 15 feet (Rio Hondo). Refer to table 14 for stream names and lengths within the watershed.

Table 14. Existing streams within the Rio Hondo watershed

Stream	Length (feet)
Gavilan Canyon	11,066.35
Italianos Canyon	12,725.87
Lake Fork	12,009.67
Long Canyon	9,543.94
Manzanita Canyon	15,113.94
Rio Hondo	26,564.68
South Fork Rio Hondo	23,892.33
Yerba Canyon	15,708.23
Unnamed	235,121.04
Grand Total	361,746.05

Rio Hondo Watershed

Land use in the Upper Rio Grande watershed ranges from undeveloped forest to ranches, croplands, settlements and ski areas. Land use within a watershed contributes to stream health and water quality by affecting the groundcover and permeability of the land. Water flow over natural or undeveloped lands is interrupted by vegetation, soil infiltration and topography. As development occurs water yield, runoff rates, sedimentation and water pollutants can all increase while natural channels are interrupted and water courses change. Although approximately 90 percent of the 21-square mile watershed is undeveloped, the Rio Hondo provides domestic water supply, wildlife habitat and aesthetic values within the Rio Hondo Basin and therefore water quality impairments are monitored closely.

The Rio Hondo is the largest stream located within the project area, and has the greatest potential for impacts due to implementation of any of the projects. It is within, or downstream of, all of the projects identified in the proposed action and alternative 3. Four water gage stations are located on the Rio Hondo: two near TSV, one downstream near Valdez and one further downstream near the confluence with the Rio Grande. In 2000, the Valdez gage reported mean annual flow of 35.4 cubic feet per second (cfs), with a minimum of 13 cfs and a maximum of 72 cfs.

Impaired Surface Waters and Total Maximum Daily Load

Two stream segments have been identified as impaired in the State of New Mexico 303(d) impaired surface waters list and have potential to be directly affected by actions within the TSV SUP area: a downstream portion of the Rio Hondo, from the Rio Grande to the FS boundary (9 miles downstream), and the Rio Grande from Rio Pueblo de Taos to Red River (24 miles downstream).[116] The portion of the Rio Hondo from the FS boundary to the Rio Grande has been listed in the past for temperature, pH, total ammonia, and stream bottom deposits. Currently this segment is listed for nutrients and the New Mexico Environment Department assigned a TMDL for temperature to this reach. The Rio Grande, 24 miles downstream of TSV, has been listed for turbidity, stream bottom deposits and temperature. Currently it is listed for stream bottom deposits only.[117]

Surveys of the Rio Hondo near TSV above and below the Village of Taos Ski Valley waste water treatment plant between 2000 and 2004, demonstrated that the segment fully supports its designated uses, however, a total maximum daily load (TMDL) has been identified for nitrogen and phosphorus in this portion of the Rio Hondo. Nitrogen and phosphorus are essential nutrients in freshwater ecosystems, driving productivity in plants and algae. Nitrogen and phosphorus enter this stream in a variety of ways namely: precipitation, parking lot and recreation site runoff, groundwater, and waste effluent transport. When nitrogen and phosphorus are present in excess, the nutrient enrichment results in excessive growth of algae and higher aquatic plants which affects the aesthetic and ecological characteristics of the stream. Surveys have shown that below the Village of Taos Ski Valley's waste water treatment plant, no increase in either nitrogen or phosphorus should occur. The TMDL was created to monitor effluent discharges from the Village of Taos Ski Valley wastewater treatment plant.[118]

A calculation was developed to estimate the TMDL for nutrients based on: 1) land use types and other natural background nutrient levels, 2) growth allocation, 3) point sources such as the Village of Taos Ski Valley waste water treatment plant effluent, and 4) a margin of safety.

Land use types were defined using a geographic analysis of land cover extent, proportion of canopy cover and type within the upper Rio Hondo Watershed.[119] Each land cover type, forest, shrubland, grassland and urban, was assigned a nutrient export coefficient for nutrient delivery based on soil erosion within 50, 500 and 5000 meters of streams and wetlands. Export coefficients range from highest for the urban cover type, then shrubland, grasslands and finally the lowest coefficient for nutrient delivery from forest land cover. Similarly, those areas closest to surface waters have the highest coefficient (within 50 meters)—those further from surface waters

[116] New Mexico Environment Department Surface Water Quality Bureau, 2010a

[117] New Mexico Environment Department Surface Water Quality Bureau, 2010b

[118] New Mexico Environment Department Surface Water Quality Bureau, 2005

[119] USDA Forest Service, 2008

have lower export coefficient values. Potential nutrient sources within the project area include: the waste water treatment plant, construction and urban development, ski slopes, hiking and biking trails, parking lots, atmospheric deposition and undeveloped land (nutrient export occurs under natural conditions).

Field surveys identified activities such as snow removal and other runoff from the ski area parking lot that contribute sedimentation to the Rio Hondo. Graded or paved areas have the potential to route overland flow to stream channels unless they are properly disconnected. Sediment from gravel applied for traction in the parking lot is the biggest contributor of sedimentation to area streams. Drainage from impervious surfaces or areas that have reduced topsoils can result in increased water yield and rates of runoff. Additionally impervious surfaces can function as conduits for pollutants and sediment from high-runoff areas to the stream channel.[120] Generally, the effects of overland flow from graded areas can become negligible when they are disconnected by routing flow to permeable soils with established vegetative cover rather than into stream channels.[121]

The growth allocation is incorporated into the model to account for development and expansion through 2020. For TSV this includes future projections for the Village of Taos Ski Valley development as well as increased demand for the waste water treatment plant. In addition the existing use and waste load allocation for the waste water treatment plant is incorporated into the model. Finally, a margin of safety is used as a buffer to ensure that water quality is maintained.

The New Mexico Environment Department calculated the estimated annual target load for phosphorus, 3.19 pounds per day, and nitrogen 31.9 pounds per day.

Rio Hondo

Within the project area, the Rio Hondo flows along the east end of the parking lots then turns west to flow along the base of TSV's popular Strawberry Hill beginner terrain and tubing hill. At that point railway car supports (flatbeds) and wooden boards are used to bridge the Rio Hondo for approximately 200 feet. The bridge is used by TSV as an access road in the summer and a tubing platform in the winter. Channel banks observed within the project area are generally stable with abundant shrubby vegetation. The Rio Hondo has been culverted in three locations and tributaries have been culverted in numerous locations within the project area. The Rio Hondo and its tributaries are constrained by parking lots and other urban development on both FS and private lands.

Within the stream segment covered by railway car supports, a water diversion pipe draws water from the Rio Hondo, at a total capacity of 2,000 gallons-per-minute. Taos Ski Valley holds a diversionary right of 200 acre feet (AF), 65.2 million gallons, from the Rio Hondo annually.[122] Water meters are located at the diversion stations. The amount of water that is diverted is reported to the State of New Mexico on a quarterly basis.

Taos Ski Valley's snowmaking system provides coverage on approximately 193 acres of the developed terrain across the SUP area. This coverage requires approximately 193 AF, or 62.9 million gallons of water (assuming a coverage depth of 24 inches). Snow is made on the majority

[120] Shanley and Wemple, 2002

[121] Tague and Band, 2001; LaMarche and Lettenmaier, 2001

[122] State of New Mexico, State Engineer Office file # 01701A

of beginner through intermediate-level trails. The typical 11-week snowmaking season starts in late October and is finished by mid-January. An average depth of 18 to 24 inches of snow is required to open critical terrain in the teaching area, as well as Powderhorn (Intermediate) and upper and lower Whitefeather (Novice).

Other Perennial Streams

Three other unnamed perennial streams have been identified within the project area; one in the Wild West glades, one that flows down the *Shalako* and *Baby Bear* trails near Lift 4, and one that flows along the east edge of *North American*. The stream located within the Wild West glades is undisturbed and has a surrounding wetland fringe. This stream averages 2 feet in width and runs above ground for approximately 20 feet. The perennial stream that runs down *Shalako* and *Baby Bear* was previously cleared of adjacent riparian vegetation and revegetated with grasses commonly used watershed restoration and seeding. Currently revegetation on these trails is well established and a closely spaced network of water bars route overland flow away from the stream. The perennial seep along the east edge of *North American* is somewhat deeply incised and has a small (1 to 2 feet wide) surface flow. Woody debris located within the channel and on its banks is common. Herbaceous ground cover along the stream is abundant.

Wetlands

Wetlands within the project area consist of riparian wetland systems fed by the Rio Hondo and groundwater seeps. Approximately 1.0 acre of jurisdictional and non-jurisdictional wetlands was identified within the project area.[123] Some of the wetlands delineated had been disturbed by previous parking area development. Approximately 2.8 acres of graded terrain exists within 100 feet of wetlands. Wetlands 2, 3, 4 and 5 all share at least one edge with the parking area and as a result sand and gravel in the wetlands is common; however, in all cases, moderately deep (8 to 10 inches) soils, hydrophytic vegetation and hydrologic indicators are present and functional.

Wetlands within the project area offer varying degrees of wildlife and plant habitat, water storage, and filtration properties. All of the wetlands delineated have maintained wetland vegetation and soils and are able to function for water resources; however, due to size, location and the surface disconnection between the wetland and the Rio Hondo, the value of wetlands 2 and 3 for wildlife habitat has been reduced from values prior to area development. Wetlands 1, 2, 3 and 4 are located in an area where human use, noise, cars and construction vehicle use is common. Although these wetlands are intact, due to their location wildlife use is limited.

Wetland classification is based on the Cowardin classification system.[124] The Cowardin system classifies wetlands primarily by dominant plant community. Two types of jurisdictional wetlands were identified within the project area consisting of palustrine emergent (PEM) and palustrine shrub/scrub (PSS). Dominant wetland vegetation at TSV includes *Salix planifolia*, *Carex sp*.,

[123] Wetland 6 was the only proposed non-jursidictional wetland. As previously mentioned, wetlands were delineated following standard protocols. However, a formal jurisdictional determination has not been provided by the U.S. Army Corp of Engineers.
The USACE differentiates between jurisdictional and non-jurisdictional wetlands and therefore the difference is disclosed within this report. The USDA Forest Service recognizes and protects both jurisdictional and non-jurisdictional wetlands.

[124] Cowardin et al., 1979

Equisetum arvense, Aconitum colubianum, Veratrum viride, Heracleum lanatum, Populus tremuloides, and, *Dactylis glomerata.*

Table 15. Existing wetlands identified within the special use permit area

ID	Type	Area
1	PSS	0.14
2	PSS/PEM	0.06
3	PSS	0.05
4	PSS	0.55
5	PEM	0.19
6	PEM	0.04
Total		**1.03**

Palustrine Emergent Wetlands

Palustrine emergent wetlands (PEM) have been identified across 0.23 acre within the project area. This wetland class is characterized by the presence of erect, rooted, usually perennial, herbaceous hydrophytic plants.[125] *Carex* sp., *Equisetum arvense*, *Aconitum colubianum* and *Heracleum lanatum* are the dominant plants. Low chroma soil matrices and a thick organic layer, 10 inches or greater, are characteristic of these hydric soils. PEM wetlands throughout the project area are generally located where seeps emerge to the surface.

Palustrine Shrub/Scrub Wetlands

Palustrine shrub/scrub (PSS) wetlands were most common within the project area, totaling approximately 0.74 acre. Cowardin et al. has defined this type of wetlands as being dominated by a woody vegetation community composed of shrubs and young trees less than 6 feet tall.[126] The dominant species present within these wetlands includes *Salix planifolia*. The majority of the PSS wetlands found within the project area were found within riparian zones of perennial drainages.

Palustrine Shrub Scrub/Palustrine Emergent Wetlands

The PSS/PEM in the project area measured approximately 0.06 acre and is a mosaic of the wetland plants describe above including *Salix planifolia* and *Heracleum lanatum*. These wetlands were saturated at approximately 16 inches during a dry year and had approximately 10 inches of low chroma hydric soils. It was determined that because this wetland does not exist under normal conditions (due adjacent parking lot development and the effects on hydrologic flow), as well as the drier than normal winter and summer conditions for the area at the time of the survey, saturation within the upper 16 inches is a sufficient indicator of wetland hydrology.

[125] Ibid.

[126] Ibid.

Geology and Soils

Geology adjacent the Rio Hondo east of Valdez includes primarily Precambrian igneous (granite, andesite, porphyry) and metamorphic (schist, gneiss and quartzite) rocks, with small deposits of Pennsylvanian sedimentary rocks. The landscape was created by glaciers, water erosion and mass wasting.[127] These Precambrian and Pennsylvanian rocks are over laid by 13 map units within the SUP boundary (refer to table 16 below).

Table 16. Existing soils within the Taos Ski Valley special use permit area

Soil Map Unit	Acres
99 Aquic Cryofluvents	57.97
305 Dystric Cryochrepts[a]	25.57
308 Dystric Cryochrepts[a]	147.47
309 Dystric Cryochrepts[a]	5.05
313 Dystric Cryochrepts/Typic Paleoboralfs[a]	351.12
316 Dystric Cryochrepts/ Typic Paleoboralfs[a]	151.91
317 Dystric Cryochrepts/ Typic Paleoboralfs[a]	88.69
341 Pergelic Cryumbrepts/Rubble Land/Rock Outcrop	20.84
602 Rubble Land/Rock Outcrop	36.74
603 Dystric Cryochrepts/Rubble Land	5.82
910 Dystric Cryochrepts/Typic Cryaquolls	2.02
922 Typic Dystrochrepts/Typic Udorthents	1.67
999 Dystric Cryochrepts/Typic Paleboralfs/Rock Outcrop	394.64
Grand Total	**1,289.50**

[a] While the soil names may be identical or very similar other elements of the map units directly drive management interpretations and can be used to predict or infer responses to management actions. Numerous distinctions between the map units include but are not limited to:
1) soil dominance (single soil named v. multiple soils named (consociation v. complex)
2) slope range soils occur within (15 to 40% slopes vs 40 to 80% slopes)
3) vegetation community associated with each map unit (i.e., some have aspen as a vegetation component while others occur at higher elevations and aspen is absent).

Soils in the project area are variable but generally have a loam or sandy loam surface and the pH is slightly acidic. Soil organic matter is generally limited in the well drained soils, except where wetlands exist as identified on map 5 in appendix A. Surface and subsurface soil erodibility is low to moderate within the project areas (K values of the whole soil [kw] ranging from 0.1 to 0.15).[128] However, potential for rilling and minor surface erosion within the project area is generally severe due to steep slopes, which have an increased potential for erosion. Erosion can be

[127] USDA Forest Service, 1981

[128] NRCS, 2008. The factor K represents the soil's susceptibility to erosion in their plot condition based on soil texture. Soils that are resistant to erosion have low K values (0.02 to 0.15); display moderate erosion are in the middle of the range (0.25 to 0.40); and highly erodible soils tend to have values greater than 0.4.

minimized through BMPs such as prompt revegetation and application of erosion control methods such as mats/blankets and/or mulching disturbed areas are practices that can be utilized.

Environmental Consequences

The standards, guidelines and EOs identified in the Existing Conditions section, as well as the issues and indicators discussed in chapter 1 of this EIS, guide the analysis of streams, wetlands and soil conditions upon implementation of alternatives 1, 2 or 3.

Alternative 1 – No Action

Streams

Under alternative 1, approximately 68 miles of streams would exist within the Rio Hondo watershed. Land use in the watershed would continue to have affects on the water quantity and quality; however, no additional affects to hydrology within the watershed would be anticipated as a result of the No Action alternative.

Wetlands

The riparian wetland systems fed by the Rio Hondo and groundwater seeps would be maintained within the project area. Although existing impacts from adjacent graded areas would continue, especially in wetlands 2, 3, 4 and 5, no new impacts to wetlands would occur within this watershed as a result of alternative 1.

Geology and Soils

No ground disturbance would occur under the No Action alternative and therefore no impacts to the geological or soils resource would be anticipated as a result of approval of this alternative.

Alternative 2 – Proposed Action

Streams

Under alternative 2, approximately 361,750 feet of streams would continue to exist within the Rio Hondo watershed. Project components that have potential to affect streams in the area are: the Lift 4 replacement, the Wild West Glades, the Mountain Bike Trail, the Snowtubing Center and the parking lot reconfiguration. All of the project components in alternative 2 are analyzed below. Under alternative 2 approximately 1.79 acres (1.51 acres on NFS lands and 0.28 acre on private lands) of grading and clearing would occur within the stream influence zone; however, 0.44 acre would be re-grading the previously graded parking lot. Clearing and grading within 50, 500 and 5000 meters of streams and wetlands can result in increased sediment inputs to streams, by converting ground cover to more erodible and less permeable land types. Under alternative 2 the following land type conversions would occur:

Table 17. Conversion of cover types

Cover Type Conversion	Acres
50m Buffer	
Grassland to Urban	0.87
Forest to Urban	0.12
Shrubland to Grassland	0.54
500m Buffer	
Grassland to Urban	3.57
Forest to Urban	3.43
Forest to Grassland	1.12
Shrub to grassland	0.24
5000m Buffer	
Grassland to Urban	0.30
Forest to Urban	0.35
Forest to Grassland	0.59
Shrubland to Grassland	0.01

Although the primary nutrient inputs are attributable to effluent from the waste water treatment plant, runoff, erosion and sedimentation can raise the background nitrogen and phosphorus to levels above those established for the TMDL. The proposed projects would result in changes to cover types within the three buffer distances which could increase nitrogen loads to the Rio Hondo by 0.04 pound per day or 6.6 kg annually, a 0.6 percent change from existing conditions. Total phosphorus has the potential to increase by approximately 0.1 pound per day, or an increase of 17.3 kg annually, a 10.8 percent increase from existing conditions. Despite the cover type conversions, any increase in runoff, erosion or sedimentation would be addressed by the application of FS best management practices such as:

- A Storm Water Pollution and Prevention Plan will be developed prior to implementation of project activities.
- Avoid soil-disturbing activities during periods of heavy rain or wet soils.
- Implement any work within or directly adjacent stream channels and wetlands, when hydrologic flows are reduced (late-summer and early fall).
- Keep heavy equipment out of the Rio Hondo.
- Do not create slash piles near the Rio Hondo.
- Design and construct water bars to discharge surface runoff originating from proposed ski trails and mountain bike trails into well-vegetated areas.
- In all areas where grading or soil disturbance will occur, topsoil or other organic amendment will be stockpiled and respread following slope grading and prior to reseeding.

- Use mechanical subsoiling or scarification of areas determined to have been compacted by construction activities.
- During construction activities, use surface netting, in conjunction with mulching.
- Promptly revegetate all disturbed areas with native plant seed. Seed mixtures and mulches will be noxious weed-free. Non-persistent, non-native perennials or sterile perennials may be used immediately after implementation, while native perennials become established. The Forest Service must approve the seed mixtures prior to implementation.
- Re-establish effective ground cover upon completion of ground disturbing activities (mulch, scatter slash) at levels that occurred prior to disturbance.
- Maintain vegetation buffers adjacent to intermittent or perennial drainages and wetlands, to the extent possible. Where avoidance is not possible, appropriate erosion control practices (i.e., silt fences or straw wattles) will be employed.
- Lay felled trees across the riparian zone at 20 to 45 degrees to the stream channel.
- In gladed areas, maintain existing organic cover during thinning and slash treatment. If disturbance to the organic cover occurs, replace the disturbance with slash or material from an adjacent layer.
- Where possible, use existing maintenance roads for construction and routine maintenance of the proposed project components.
- Store fuel, oil, and other hazardous materials in structures placed on impermeable surfaces with impermeable berms designed to fully contain the hazardous material plus accumulated precipitation for a period at least equal to that required to mitigate a spill.
- Construction limits will be clearly defined and any identified wetlands will be avoided where possible.

With implementation of these best management practices, total nitrogen could be maintained within the annual load limit for nitrogen of 31.9 kg of nitrogen per year and total phosphorus could be maintained within the annual load limit for phosphorus of 3.19 kg N per year as defined in the TMDL.

Ground disturbance and impacts are discussed by project, below.

New Lifts

Construction and operations of the Main Street Lift and Ridge Lift would result in cover type conversions of grassland to urban, forest to urban and forest to grassland increasing the nutrient export coefficient for these areas. However, with the proper use of FS BMP, increases in runoff, sedimentation and erosion for the land type conversion is anticipated to be minimized and nutrient export would remain within the load limits for the Rio Hondo.

Lift Replacements

Lifts 4, 5 and 7 would result in a grassland to urban cover type conversion which would have potential to increase nutrient export to the Rio Hondo. Portions of the Lift 4 replacement would occur within 50 meters of an unnamed perennial tributary to the Rio Hondo requiring approximately 0.02 acre of grading from tower placement. Land conversion within the 50-meter

buffer have the highest nutrient export coefficients as those disturbances have the greatest potential to effect water quality in the adjacent stream. Currently revegetation on *Shalako* and *Baby Bear*, where the stream is located and tower installation is proposed, is well established and a closely spaced network of water bars route overland flow away from the stream. During construction, lift removal and replacement, construction vehicles would cross the stream on designated maintenance roads, eliminating the need to create new crossings. Tower placements within 50 meters of the stream would be minimized. Appropriate drainage management would be required during construction, with sediment fencing, straw bales and wattles/erosion logs being used to keep any sediment out of the stream.

With implementation of drainage management practices and BMPs, increases in runoff, sedimentation and erosion would be minimized and nutrient export would remain within the load limits for the Rio Hondo.

Glades

Tree thinning would occur across approximately 71.9 acres of forest for the Minnesotas and Wild West glades. Although the forest canopy area would be reduced, the level of thinning would not exceed any canopy cover that defines the forest land cover type, therefore no land type conversion would occur.[129] To minimize ground disturbance tree felling would be completed by hand crews using chain saws and trees would either be removed or scattered within the project area. These construction practices would minimize impacts to ground vegetation, therefore reducing the potential to modify runoff, erosion and sedimentation. Further, creating greater canopy spacing has been shown (in the previously implemented *North American Glades*) to improve understory abundance and diversity, increasing stabilizing vegetation and reducing potential for erosion. Due to the minimal ground disturbance resulting from thinning and the abundance of existing and potential understory vegetation, no cover type conversion was identified within the gladed area, therefore the glades would not contribute to an increase in nutrient export.

Although thinning would occur in the forested area surrounding the perennial stream and wetland within the Wild West Glades, tree removal within the 50 meters of the stream and wetland would be minimized to reduce any disturbance within the stream/wetland area. No affects to this stream are anticipated.

Snowtubing Center

The Snowtubing Center would be built to cross the Rio Hondo on the existing railway car supports. A graded platform would be created to provide the appropriate angle for tubing, but the lanes and side walls would be created from manmade snow. The tubing facility would require an additional 2.3 AF (or 733,166 gallons) of water diversions from the Rio Hondo. Total snowmaking diversions would be increased to 195.3 AF, within the existing diversion right of 200 AF.

A total of 0.15 acre (0.7 acre on NFS lands within the SUP and 0.8 acre on private land) of grading would be required to create the Snowtubing Center. On NFS lands no cover type conversion would occur (the area would remain grassland) however on private lands adjacent the Rio Hondo the existing shrubland would be converted to grasslands, increasing the nutrient

[129] USDA Forest Service, 2008

export potential. This disturbance would occur within the 50-meter buffer, therefore has the highest potential to effect nutrient levels reaching the Rio Hondo.

To minimize potential impacts to the Rio Hondo from grading as well as ongoing grooming and snowmaking activities, appropriate drainage management such as sediment fencing, straw bales and wattles would be used to minimize the flow of sediment from the graded area/grassland area into the Rio Hondo. Topsoil removed from the area would be stockpiled and re-spread once grading is complete. After construction the entire area would be revegetated and sediment retention basins and drainage management would be installed within the project disturbance footprint to manage overland flow. With implementation of appropriate FS BMP, nutrient export to the Rio Hondo could be minimized and nitrogen and phosphorus would remain below the annual load limits as established by the TMDL.

Snowshoe Trails

The snowshoe trails would be created over the snow with little tree removal. Ground disturbance within would be negligible and is not anticipated to have any effect on runoff, erosion, sedimentation or project area streams. Although the forest canopy area would be reduced, the level of thinning would not exceed any canopy cover that defines the forest land cover type, therefore no land type conversion would occur.

Mountain Bike Trail

Approximately 0.13 acre of grading would occur associated with construction of the 24-inch wide Mountain Bike Trail. While the trail would not actually result in an area land type conversion (the forest would remain a forest), because of the increase potential of a graded trail routing runoff directly to a stream or wetland, the graded area was analyzed as a conversion from forest to urban land type. With the appropriate stream crossings and drainage measures (rolling dips, water bars and reverse sloped trails), the length of trail that connects to the stream channel could be minimized. However, because the trail crosses the drainage in two locations (by log bridge or similar), it would be difficult to completely disconnect the entire length of trail from the stream. Due to the size of the trail and stream, as well as the use period (after high flow conditions when the trail has dried out) sedimentation related the Mountain Bike Trail could be minimized, and the nutrient export of nitrogen and phosphorus would remain below the annual load limits as established by the TMDL.

Resort Access

Currently the parking area does not have a drainage management or snow removal plan. Approximately 0.28 acre of new grading (including 0.11 acre of tree removal and grading) and 0.44 acre of re-grading would occur for the parking reconfiguration within 50 meters of streams and wetlands. The parking reconfiguration would result in converting both forest and grassland to the urban land cover type increasing the potential for nutrient export.

Particularly during construction, this high-runoff area has potential to result in sedimentation to the perennial streams within the project area, and implementation of appropriate drainage management would be necessary to route runoff away from streams. Repaving the parking lots reduces the potential for erosion; however, appropriate areas for snow storage and plowing strategies should be identified to minimize the flow of gravel into streams.

Prior to ground disturbance for the parking reconfiguration project, a SWPPP would be designed and implemented to establish erosion and sedimentation control in these areas adjacent the Rio Hondo. A SWPPP would include management and operating procedures such as:

- Temporary and permanent erosion control measures that would be utilized on disturbed sites to minimize the potential for soil erosion such as drainage ditches and dips to route runoff away from streams.
- Appropriate location and size of sediment traps throughout the parking area.
- Timing of construction to avoid wet soil conditions to prevent rutting, puddling and soil compaction.
- Post construction site inspection and site stability monitoring.

With implementation of these management practices, potential increases in nutrient transport would be maintained below annual load limits established in the TMDL for the Rio Hondo.

Wetlands

Proposed projects with potential to affect wetlands include the Snowtubing Center and the parking reconfiguration. To reduce impacts to wetlands, the proposed action was modified by changing the location of the tubing area to the current location that does not impact wetlands to the extent of the originally planned location. The original location was further removed from base area developments in a generally natural setting. In addition, the parking reconfiguration was changed slightly to avoid impacts to wetland 2.

The Snowtubing Center proposed under alternative 2 would eliminate 0.14 acre of PSS wetland 1. The location of the Snowtubing Center is currently heavily developed with the popular Strawberry Hill teaching terrain and tubing lanes on the south side of the Rio Hondo, and the parking lots on the north side. Under alternative 2, the Snowtubing Center would be realigned and expanded causing wetland 1 to be eliminated. A U.S. Army Corps of Engineers (USACE) permit would be required prior to wetland impacts. A condition of the permit would be to mitigate loss of this wetland. Wetland mitigation has been identified that would create a PSS wetland upstream from the tubing location, along the Rio Hondo. This mitigation would be implemented concurrently with, or prior to, grading the tubing area.

Approximately, 2.3 acres of grading and overstory vegetation removal would occur within 100 feet of wetland edge. Thinning would be avoided within 100 feet of the 0.04-acre PEM wetland in the Wild West Glades to avoid impacts to wetland 6.

Geology and Soils

Implementation of alternative 2 would result in approximately 8.3 acres of new grading (including 2.5 acres of clearing) for new lifts, lift replacements, the Mountain Bike Trail, the Snowtubing Center and the parking reconfiguration, 1.7 acres of clearing, and 10 acres of regrading (in the new parking lot). Additionally, thinning would occur across approximately 72 acres for the glading projects; however, as discussed above, the cover type would remain forest cover and therefore impacts to the soils resource from thinning would be negligible and are not included in the impacts tables below.

Soils in the project area have been identified as having severe erosion hazard (sheet and rill) potential due primarily to the shallow topsoil and steep slopes table 18. However, K-factor values best reflect natural soil conditions in the field as rock fragment serve to “armor” soil and make them less erodible overall. Together surface and subsurface soil erodibility (Kw) is low within the project areas, with Kw values of surface soil horizons ranging from 0.1 to 0.15. Soils with low whole soil erosion susceptibility, generally respond to normal erosion management practices.

New grading under alternative 2 would be associated with new lift and lift replacement projects, the Snowtubing Center, the Mountain Bike Trail, and the parking reconfiguration. Grading is associated with the greatest soil disturbances due to short-term soil disturbances from ground cover and soil removal, exposing disturbed soils, soil mixing and soil compaction, additionally, the long-term loss of soil organic matter, the A and O horizons, can result in less permeability and increased rates of runoff.

New Lifts and Lift Replacements

The new Main Street and Ridge lifts and the lift 4, 5 and 7 upgrades would result in disturbance to approximately 3.2 acres for lift terminals and lift tower placements. Across approximately 3.0 of those acres topsoil would be spread and reseeded, however 0.2 acre would be replaced with terminals and tower footers. This would increase the area of impermeable surface within the project area, as well as the Rio Hondo watershed, but would have negligible impacts on the soils resource. Areas adjacent the facilities and towers would be revegetated after construction was complete. Where clearing occurs for the new lifts, some increased erosion may occur, however by keeping groundcover intact these effects would be minimized.

Glades

By maintaining the existing ground cover due to removal of trees by hand and bucking and scattering the debris, impacts to soils resources within the Minnesotas and Wild West glades would be negligible.

Snowtubing Center

Construction of the Snowtubing Center would result in 0.6 acre of grading and willow removal on NFS lands and 0.06 acre of re-grading on the Strawberry Hill terrain (on private lands). Although these soils (Aquic Cryofluvents) have been identified as having severe erosion hazard potential, the whole soil value indicates the actual potential is low. Additionally, slopes in the area of the tubing center would range from 20 to 5 percent and erosion could be minimized through appropriate control measures such as a closely spaced network of water bars to intercept overland flow as well as successful revegetation.

Snowshoeing

The Snowshoe Trails would be constructed over the snow with minimal tree removal. Ground disturbance anticipated for the snowshoe trails would be negligible.

Mountain Bike Trail

Approximately 1.4 acres of new grading would be required to construct a 2-foot wide trail for downhill mountain biking. Some steep areas would require cut and fill disturbance to create the 2-foot wide platform. These cut and fill slopes would be designed to maintain the trail width and bank stability over time using slope and revegetation. Impacts to the soils resource would be

minimal provided the implementation of BMP's and successful erosion control and revegetation of disturbed areas.

Resort Access

Under alternative 2 impacts to the soils resource would include approximately 3.0 acres of new grading to create a new parking bay and the access road. Additionally, approximately 10 acres of re-grading would occur within the existing parking footprint. Adding to the parking area would result in a greater area of impermeable surface within the project area and the headwaters of the Rio Hondo. Concentration of overland flow from the paved areas potentially can result in erosion and sediment from the drainage ditches along the margins of the parking lots or adjacent vegetated areas. Maintenance of vegetation and stabilization of the drainage ditches can reduce this potential soil loss. A SWPPP would be required prior to implementation of the parking reconfiguration.

Table 18. Soils with severe erosion hazard within the alternative 2 project areas

Soil Map Unit and Soil Class	Acres	K Factor	Erosion Hazard (Sheet & Rill)	Topsoil Suitability	Trail Limitation
305 Dystric Cryochrepts l	0.23	0.15	Severe	Poor	Moderate
New Grading	0.23				
308 Dystric Cryochrepts	1.15	0.15	Severe	Poor	Moderate
Clearing	0.05				
Clearing/Grading	0.29				
New Grading	0.81				
313 Dystric Cryochrepts/ Typic Paleoboralfs	1.50	0.1	Severe	Poor	Severe
Clearing	0.38				
Clearing/Grading	0.06				
New Grading	1.05				
316 Dystric Cryochrepts / Typic Paleoboralfs	0.85	0.15	Severe	Poor	Moderate
New Grading	0.85				
602 Rubble Land /Rock Outcrop	0.06		Severe	NA	NA
Grading	0.06				
99 Aquic Cryofluvents	13.63	0.15	Severe	Poor	Severe
Clearing/Grading	2.08				
Grading	1.60				
Re-grading	9.96				

Table 18. Soils with severe erosion hazard within the alternative 2 project areas

Soil Map Unit and Soil Class	Acres	K Factor	Erosion Hazard (Sheet & Rill)	Topsoil Suitability	Trail Limitation
999 Dystric Cryochrepts / Typic Paleboralfs	2.58	0.1	Severe	Poor	Severe
Clearing	1.31				
Clearing/Grading	0.09				
Grading	1.17				
Grand Total	**20.00**	**0.1 to 0.15**	**Severe**	**Poor**	**Moderate to Severe**

Alternative 3

Alternative 3 includes the lift upgrade projects, the Minnesotas and Wild West Glades, the snowshoe trails and the Mountain Bike Trail. As such, the impacts from those projects would be the same as for alternative 2, but are also summarized below.

Streams

Approximately 0.15 acre of grading would occur within 50 meters of streams and wetlands within the project area as a result of implementing the Lift 4 upgrade and the Mountain Bike Trail. Total within the 5000-meter buffer, two land type conversions would occur, grassland to urban and forest to urban cover. These conversions can result in increased runoff, erosion and sedimentation.

The proposed projects would result in changes to cover types within the three buffer distances which could increase nitrogen loads to the Rio Hondo by 0.03 pound per day or 5 kg annually, a 0.5 percent change from existing conditions. Total phosphorus has the potential to increase by 0.1 pound per day, a change of 17.7 kg annually, a 10.8 percent increase from existing conditions. Despite the cover type conversions, any increase in runoff, erosion or sedimentation would be addressed by the application of FS best management practices identified above, under Alternative 2. With the appropriate drainage measures for lift installation and Mountain Bike Trail, nutrient export would be minimized and the export of nitrogen and phosphorus would remain below the annual load limits as established by the TMDL.

Wetlands

Selective tree removal would be designed to leave trees within and immediately adjacent the PEM wetland that is located within the Wild West Glades. This construction plan would avoid impacts to wetlands under alternative 3.

Geology and Soils

Soils in the project area have been identified as having severe erosion hazard (sheet and rill) potential due primarily to the shallow topsoil and steep slopes (refer to table 18). However, K-

factor values best reflect natural soil conditions in the field as rock fragment serve to “armor” soil and make them less erodible overall. Together surface and subsurface soil erodibility (Kw) is low within the project area, with Kw values of surface soil horizons ranging from 0.1 to 0.15. Soils with low whole soil erosion susceptibility generally respond to normal erosion management practices.

Under alternative 3, grading would occur for the replacements of lifts 4, 5 and 7 and the Mountain Bike Trail. Approximately 2.1 acres of grading would occur for lift terminals and lift tower placements. Topsoil would be spread across approximately 2.0 acres, however 0.1 acre would be used for permanent structures. This would increase the area of impermeable surface within the project area, as well as the Rio Hondo watershed, but would have negligible impacts on the soils resource. Areas adjacent the facilities and towers would be revegetated after construction was complete.

Grading for the Mountain Bike Trail would require approximately 1.4 acres of ground disturbance. Some steep areas would require cut and fill disturbance to create the 2-foot wide platform. These cut and fill slopes would be designed to maintain the trail width and bank stability over time using slope and revegetation. Impacts to the soils resource would be minimal.

Table 19. Soils with severe erosion hazard within the alternative 3 project area

Soil Map Unit and Soil Class	Acres	K Factor	Erosion Hazard (Sheet & Rill)	Topsoil Suitability	Trail Limitation
305 Dystric Cryochrepts	0.23	0.15	Severe	Poor	Moderate
grading	0.23				
308 Dystric Cryochrepts	0.71	0.15	Severe	Poor	Moderate
grading	0.71				
313 Dystric Cryochrepts/ Typic Paleoboralfs	45.76	0.1	Severe	Poor	Severe
grading	1.05				
316 Dystric Crochrepts/ Typic Paleoboralfs	0.85	0.15	Severe	Poor	Moderate
grading	0.85				
999 Dystric Cryochrepts/ Typic Paleboralfs	.074	0.1	Severe	Poor	Severe
grading	0.74				
Grand Total	**3.58**	**0.1 to 0.15**	**Severe**	**Poor**	**Moderate to Severe**

Cumulative Effects

Appendix A includes a list of past, present, and reasonably foreseeable future projects have been identified by the Forest Service as relevant from a cumulative effects context.

The spatial extent of the cumulative effects analysis are streams, wetlands, geology and soils within, the SUP and on adjacent private lands.

The temporal bounds for the cumulative effects analysis of streams, wetlands, geology and soils resources extends from TSV's inception as a resort in 1955, 10 to 15 years into the future when the project has been fully implemented and mitigation is complete.

Taos Ski Valley Past Development

In the past, streams, wetlands, geology and soils have been disturbed by ski area development resulting in changes to hydrologic conditions, wetland function and values, reduced soil permeability and increased erosion. Clearing, grading and infrastructure have resulted in culverts and bridges on streams within the project area, these infrastructure impact channel morphology. Surrounding, development has resulted in increased sedimentation and nutrients such as nitrogen and phosphorus. Development in the valley have reduced wetland and riparian area as well as impacting the function and values of some of the remaining wetlands. Finally, resort construction practices such as grading as well as infrastructure has resulted in a reduction in permeability and soils resources across the SUP and on adjacent private lands. Cumulative effects from ski area development have impacted stream channels, wetlands, geology and soils in the project area. These projects are consistent with uses identified for Management Area 16 of the Carson Forest Plan.

Taos Ski Valley 2010 Master Development Plan

The majority of the projects identified in the 2010 MDP are currently undergoing site-specific NEPA analysis in alternative 2 of this Draft EIS. However, the 2010 MDP identifies other long-term projects throughout the SUP such as snowmaking, lift replacements/additions, mountain biking trails, trail grading, trail widening and a new restaurant. When considered with impacts from alternatives 2 or 3 these project would incrementally increase the development and associated impacts to streams, wetlands, geology and soils within the project area. Projects included in the MDP and not analyzed here would require site specific NEPA.

Development within the Village of Taos Ski Valley and Pattison Trust Lands

Private land developments in the Village of Taos Ski Valley and the Pattison Trust Land have added roads, residential and commercial development in a primarily natural setting. These developments have likely contributed to culverts, sedimentation, nutrient deposition, reduced wetland and riparian area and erosion. These past developments, along with implementation of alternatives 2 or 3 would impact these resources within the valley. Neither the Village of Taos Ski Valley nor the Pattison Trust have future development proposals at this time.

Livestock Grazing Hondo Allotment

Grazing is known to have impacts on streams, wetlands and soils from animal movement, plant/vegetation loss and bank stability from animal use. When considered cumulatively with

impacts from alternatives 2 or 3, this use and the ski area projects would impact streams, wetlands and soils resources in the Rio Hondo Watershed.

Irreversible and Irretrievable Commitment of Resources

No irreversible or irretrievable commitments of stream resources associated with any of the alternatives have been identified.

Under alternative 2, the loss of 0.14 acre of wetlands would be fully mitigated, therefore, no irreversible and/or irretrievable commitments of wetlands resources have been identified under any of the alternatives.

Approximately 0.2 and 0.1 acre of the soils resource would be replaced by permanent structures such as lift terminals, towers and the parking area under alternatives 2 and 3 respectively. These minor irreversible and/or irretrievable commitments of soil resources have been identified, but the effect would be negligible.

Vegetation and Wildlife Resources

The ecological analysis for vegetation and wildlife resources are considered at three scales: the project area, the TSV SUP area and the Carson NF.

This section is a summary of a detailed vegetation and wildlife technical report prepared for the TSV MDP Phase I Project which is contained in the project file. Analyses include evaluations of potential project effects on federally listed, proposed or candidate species, Region 3 (R3) sensitive species, Carson NF management indicator species (MIS), and migratory bird species.

Forest Service Manual 2670 provides direction on the review, actions, and programs authorized, funded or implemented by the Forest Service relative to the requirements of the Endangered Species Act (ESA). Under ESA, the Forest Service is required to undergo Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS) for such a federal action when it may affect listed species. No impacts to any listed species were identified and therefore Section 7 consultation is not required.

Field surveys in the project area were conducted in the spring and summer of 2011. The project area is defined as the project footprint for the proposed Main Street Lift, Ridge Lift, Wild West Glades, Minnesotas Glades, Mountain Bike Trail, Snowtubing Center, Adventure Center, lift replacements (lifts 4, 5, and 7), the parking lot reconfiguration and East Guest Drop-Off Area (see chapter 2 for a more detailed description of the proposed project components). Where appropriate for wildlife species, the analysis area extends beyond the project area.

Affected Environment

The following is a description of the existing condition of vegetation and wildlife within the project area. This is followed by discussions of each federally listed species, R3 sensitive species, MIS identified in the Carson Forest Plan, and migratory bird species that is confirmed to occur in the project area. Each species that is identified as having potential habitat or occupying an area is analyzed in detail. The environmental effects to these species are discussed in the environmental consequences section.

Main Street Lift

The bottom terminal of the proposed Main Street Lift would be on a rocky tree covered knoll, primarily covered with Engelmann spruce and whortleberry, and would climb southward to a small depression below the summit of Kachina Peak. The slopes surrounding the Main Street Lift are above timberline and are alpine tundra and rocky boulder fields.

Vegetation in the area is comprised of a variety of very prostrate plants. Grasses and sedges include sheep fescue (*Festuca ovina*), alpine bluegrass (*Poa alpine*), artic bluegrass (*Poa arctica*), timberline bluegrass (*Poa rupicola*), spike trisetum (*Trisetum spicatum*), and black and white sedge (*Carex albonigra*). Other very low growing plants including summit or snow willow (*Salix navilis saximontana*) (1 to 2 inches tall) and a very prostrate sedum called king’s crown (*Sedum rosea*).

A long-tailed weasel (*Mustela frenata*) was observed hunting the boulder field just to the west of the proposed lift, most likely for pikas. Coyote scat was also observed along the ridge.

A sharp-shinned hawk (*Accipiter striatus*) was observed flying in the area. A tagged female golden eagle (*Aquila chrysaetos*) has been frequenting this area on a regular basis.[130] Although she was not observed during the survey, the abundance of marmots may be the attraction to the area. The other avian species observed were the typical species most commonly found across the TSV permit area: including Clark's nutcracker (*Nucifraga columbiana*), gray jay (*Perisoreus canadensis*), dark-eyed junco (*Junco hyemalis*), northern flicker (*Colaptes auratus*), and common raven (*Corvus corax*).

Figure 10. View to the south of proposed Main Street Lift base terminal

Figure 11. View of proposed Main Street Lift alignment from the upper terminal

[130] Dale Stahlecker's tracking data (unpublished)

Ridge Lift

The proposed Ridge Lift would be located in West Basin and start a few hundred feet below the top of Lift 8. The lift would be approximately 800 feet long, gaining 560 feet of elevation, and would terminate at the top of the West Basin Ridge. The slope under the proposed Ridge Lift is comprised of a patchwork of trees and boulders in a series of small drainages and ridges. The drainages are susceptible to avalanches, as evidenced by the absence of trees as well as site knowledge. The small ridges do not experience avalanches and exhibit narrow stringers of trees.

Figure 12. Proposed Ridge Lift terrain

Figure 12 shows the location of the bottom terminal of the proposed Ridge Lift, which would be just behind the small island of trees at the bottom of the slope. The lift would follow the tree line up to the top of West Basin Ridge.

The terrain under the proposed Ridge Lift is very steep and is largely made up of granitic rocky outcropsavalanche chutes and alpine tundra. Trees are relatively sparse, with Engelmann spruce (*Picea englemannii*) being the dominant species. Subalpine fir (*Abies lasiocarpa*) or cork-bark fir also occurs on the slope, but is not as prevalent. There are occasional Rocky Mountain maples (*Acer glabrum*) and common mountain junipers (*Juniperus communis*) or prostrate junipers. Some whortleberry (*Vaccinium myrtillus*) occurs in the understory. Grasses are not common, due

to the lack of surface soils; however, there are traces of fringed brome (*Bromus ciliatus*) and alpine bluegrass (*Poa alpina*).

Figure 13. A view looking down from the proposed upper Ridge Lift terminal

During spring goshawk surveys, only a few common avian species were observed using the area. Clark's nutcrackers, dark-eyed juncos, and gray jays were seen in flight crossing the ridgeline. It is likely that some passerine bird nesting could occur along the proposed lift line.

The habitat areas along the ridge could also be frequented by snowshoe hare (*Lepus americanus*) or possibly mountain cottontail (*Sylvilagus nuttallii*); however, the habitat where the Ridge Lift is proposed provides only limited forage for these species. This area was examined for droppings, but none were found. Since the ridge top is relatively narrow, it is possible larger predators could also use this area as a short movement corridor during the summer months.

Wild West Glades

Skiers would access the proposed Wild West Glades north of the proposed Ridge Lift top terminal. The proposed gladed area would begin along the narrow ridge, but quickly widen to about 500 feet. Most of the gladed area would lie about 200 feet inside the western edge of the permit boundary. To the east, the glades would be bound by the steep ridge running almost its full length. Currently, the area proposed for glading receives some limited skier use. Expert or "Extreme" skiers can currently drop into numerous access points to ski the steeps along the ridge. The Wild West Glades would be thinned gradually to allow for residual trees to become resistant to windthrow and would create a mosaic of transitional thinned areas, with a maximum thinning that would leave 30 percent canopy cover.

The habitat is densely forested throughout the length of the proposed Wild West Glades. The dominant tree species are cork-bark fir and Engelmann spruce. The vast majority of the trees are in smaller structural categories ranging from 4 to 12 inches in diameter. Occasionally, there is a small pocket, with slightly larger diameter trees in the 15 to 18 inch range. These small pockets are noticeably less dense and are spaced such that cutting of these trees would not be necessary. A minor amount of tree mortality occurs in the smaller diameter cork-bark fir, likely due to tree stand competition and is less than the mortality in the proposed Minnesotas Glades area (see below).

Figure 14. The proposed Wild West Glades area

As shown in Figure 14, the proposed Wild West Glades is located on moderately steep slopes (30 to 50 percent slope). The understory is sparse and is generally dominated by whortleberry. The canopy is dense (greater than 70 percent canopy cover) and little sunlight reaching the forest floor. The upper half of the west side of the glade area includes a stand of small, stunted bristlecone pines (*Pinus aristata*). Most of these trees are only 2 to 6 inches in diameter. The soils are very shallow and exhibit low productivity.

About half way down the slope, soils become deeper and more productive and tree size increases, with several pockets of larger trees. These areas are generally the only locations where there is any evidence of red squirrels; however, the best red squirrel habitat occurs outside the permit boundary to the west. Only two large middens were located within the proposed Wild West Glades area. Both of these sites were flagged and could easily be avoided during thinning.

Figure 15. Red squirrel midden found within the proposed Wild West Glades area

Previous studies in the area show large active red squirrel middens and cone stashing occurring in areas where large and mature cork-bark fir and Engelmann spruce are found. Cones from both species are being stashed, but most often it appears cork-bark fir trees offer the preferred cones. This also could be a result of the timing of inventory and which species of cone is more available. The presence of both, however, appears to be important. Red squirrels were observed in the area of the proposed Wild West Glades, but were not abundant, due to the lack of large structural diversity needed for prolific cone production.

The lower portion of the proposed Wild West Glades is divided by a drainage that has mild slopes, and is not steeply incised. One small seep is located near the top of the drainage. The seep has the typical mossy margins, along with some brook saxifrage (*Saxifraga punctata*). The drainage continues to broaden and is dry from that point down the slope.

The bottom of the proposed glade area flattens out to a gentle slope. Where the trail would come back to the east and connect with Lower Stauffenberg, the vegetation becomes more diverse and lush and more grasses and wildflowers are found in the understory. Richardson's geranium (*Geranium richardsonii*), Rocky mountain columbine (*Aquilegia carerulea*), nodding brome (*Bromus anomalus*), and alpine timothy (*Phleum alpinum*) And aspen trees (*Populus tremuloides*) occur commonly in the lower portion of the proposed glades.

Avian species that were recorded during surveys include the northern flicker, Steller's jay (*Cyanocitta stelleri*), gray jay, Clark's nutcracker, sharp-shinned hawk (*Accipiter striatus*), dark-eyed junco, mountain chickadee (*Parus gambeli*), and solitary vireo (*Vireo solitarius*).

Minnesotas Glades

The proposed Minnesotas Glades are located on the east side of the TSV permit area The most remarkable feature of the existing condition in this area is the massive number of standing dead cork-bark fir trees as a result of beetle mortality. There are patches within the proposed glades area that have suffered in excess of 90 percent mortality. Although smaller diameter trees were hardest hit, many fir trees larger than 12 inches have also died. The potential fire hazard from the extensive amount of dead debris in the canopy is a concern. The eastern portion of the proposed glades has less western balsam beetle mortality than the rest of the area and the stand immediately adjacent to Street Car has very little beetle mortality and exhibits better stand health. There is also much older dead material on the ground within the proposed glade area than the standing dead that has occurred more recently. The Engelmann spruce shows signs of insect damage, but proved to be hardier than cork-bark fir, with a higher survival rate.

Figure 16. View of proposed Minnesotas Glades showing high tree mortality

Although the extensive tree mortality appears to be devastating, there are likely beneficial effects for a number of species. The reduced competition within the stand from cork-bark fir die off will result in larger structural diversity and allow remaining trees to grow faster. This should also result in improved cone crops. Enough larger fir trees will remain in some pockets to provide a combination of both fir and spruce cones, thus improving red squirrel habitat over time. This animal is thought to be an important prey species for the marten. Increased herbaceous production should improve forage for small mammals, such as mice and voles. Increased seed production should benefit both small mammals and passerine birds.

The terrain is generally steeper and more challenging in the Minnesotas Glades than where the Wild West Glades are proposed. There are more benches and steep drops, as opposed to a consistent grade. The understory is heavily dominated by whortleberry. Tree mortality has resulted in increased sunlight to the forest floor, resulting in increased understory diversity. Both the wildflowers and the grasses are beginning to respond. Other species of trees and shrubs include scattered aspen, Rocky Mountain maple, Oregon-grape (*Berberis repens*), mountain ash (*Sorbus dumosa*), wild raspberry (*Rubus parviflorus*), snowberry (*symphoricarpos oreophilus*), and buffaloberry (*Sheperdia canadensis*).

Figure 17. View from the top of the proposed Minnesota Glades

Wildlife inventory surveys of the Minnesotas Glades area found the presence of common flicker, Steller's jay, Clark's nutcracker, sharp-shinned hawk, dark-eyed junco, mountain chickadee (*Parus gambeli*), solitary vireo, hairy woodpecker (*Picoides villosus*), and common raven. Mammals include black bear and red squirrel. Neither of these species was observed, but bear scat was quite common. The red squirrel's audible chatter was only heard a few times. No active or even older squirrel middens were observed.

Mountain Bike Trail

The proposed Mountain Bike Trail would primarily follow a series of switchbacks on existing disturbed surfaces from old roads and trails. This portion of the proposed trail is largely on reseeded roadbeds and existing trails used as a travel corridor for hikers and wildlife. Orchardgrass (*Dactylis glomerata*), Texas timothy (*Phleum pretense*), smooth brome (*Bromus inermis*), fringed brome, and Kentucky bluegrass (*Poa pratenses*) are the most common grasses

along the proposed trails. Other plants fairly common in the old roadbeds include Rocky Mountain strawberry, western yarrow (*Achillea lanulosa*), and dandelion (*Taraxacum officinale*).

The proposed trail would cross one surface seep in *Al's Run* and then leave the old road and follow a game trail on contour to the east crossing the *North American Glade*. This game trail is about 1 foot wide and has some encroaching vegetation, however the bike trail is proposed to be 18 to 24 inches wide and would likely be void of any encroaching vegetation. Once the proposed trail reaches the recently thinned *North American Glade*, signs of increased understory diversity already exist. The canopy cover in the thinned area averages around 40 to 50 percent. Even with the fairly dense canopy, the herbaceous groundcover has responded to increased sunlight, and there is a noticeable abundance of grasses and wildflowers, and lushness to the area.

Figure 18. An existing game trail along the route for the proposed Mountain Bike Trail

The most common wildflowers found along the eastern portion of the proposed Mountain Bike Trail include Rocky Mountain columbine, western red columbine (*Aquilegia elegantula*), heartleaf arnica (*Arnica cordifolia*), bluebell bellflower or harebell (*Campanula rotundifolia*), and Richardson's geranium. The most common of the grass species are again the fringed brome, nodding brome, Texas timothy, and alpine timothy.

As the route for the proposed Mountain Bike Trail progresses eastward, it would cross a perennial seep along the east edge of the *North American Glade*. It is fairly deeply incised and has a small surface flow for about 100 yards. The crossing would require either a log culvert or small bridge. The trail then would continue on east across *Longhorn* for several hundred feet, where it turns back and crosses *Longhorn* again. The vegetation in the area to the east of *Longhorn* is more thick

and shrubby, with much smaller trees. This area has some mountain maple and mountain ash, mostly in a stunted growth form. After crossing *Longhorn*, the proposed trail would make several switchbacks onto TSV property, near the base of *North American Glade*. It then would cross and parallel *Rubezahl* to the base area.

Snowtubing Center

The proposed tubing facility would start on *Strawberry Hill* (on private land owned by TSV) and cross the Rio Hondo on the existing old "box car bridge" to NFS lands. A half an acre of run-out is proposed on NFS lands on the north side of the Rio Hondo. This area includes a few spruce trees and alders (*Alnus oblongifolia*) as well as wetland plants, such as skunk cabbage (*Lysichiton americanus*), field horsetail (*Equisetum arvense*), cow parsnip (*Heraleum lanatum*), and various sedges (*Carex* spp.). Currently, this area has little wildlife value, as it is surrounded by developed parking lots, roads, bridges ski trails and buildings.

Snowshoe Trails

The proposed Adventure Center, a system of snowshoe trails, would be located in the northwest corner of the TSV permit area, just south of the Rio Hondo. This area has mild slopes (5 to 15 percent) and deep productive soils. The overstory is comprised of Engelmann spruce, aspen, some cork-bark fir, and occasional occurrences of white fir (*Abies concolor*), and Douglas-fir (*Pseudotsuga menziesii*). Alder is the dominant species along the edge of the Rio Hondo. The canopy is dense and closed, with large, widely spaced trees. Because of the high percentage of deciduous aspen, the canopy would be much more open during the winter months.

The understory is lush and a diverse mixture of forbs, grasses, and ferns. With the exception of patches of bracken fern (*Pteridium aquilinum*), most of the herbaceous understory is similar to what is found in the proposed gladed areas. The common grasses include orchardgrass, timothy, smooth brome (*Bromus inermis*), Kentucky bluegrass (*Poa pratenses*), fringed brome (*Bromus ciliates*), and bottlebrush squirreltail (*Sitanion hystrix*). The common forbs include Rocky Mountain columbine, western red columbine, heartleaf arnica, bluebell bellflower or harebells, Richardson's geranium, Indian paintbrush (*Castilleja haydenii*), osha (*Ligusticum porter)*, and dandelion. Common shrubs include whortleberry, elderberry (*Sambucus racemosa*), and common juniper. The area is also bisected by a seep that has surface flow for several hundred feet. In places it is confined to a single channel and in others it is braded with three or four small meandering channels. It is typified by the normal wetland species such as skunk cabbage, field horsetail, cow parsnip, and sedges.

Avian species observed in this area include the northern flicker, Steller's jay, dark-eyed junco, mountain chickadee, solitary vireo, hairy woodpecker, American robin (*Turdus migratorius*), common raven, and great horned owl (*Bubo virginianus*). Mammals include black bear (scat evidence) and mule deer. Deer were observed during each site visit. Several bedding areas were located. No red squirrel activity was observed.

Lift Replacements

All of the proposed lift replacements are located where slopes were previously cleared and revegetated. Lift 4 leads to the Kachina Basin trails, Lift 5 bisects Al's Run, and Lift 7 spans the Terrain Park. The habitat is primarily steep grassy slopes. The ski runs beneath the lift alignments

include some wildflowers and pockets of shrubs, but the competition from dense grasses limits establishment of other plants. The grasses include both native varieties and those commonly used for watershed restoration and reseeding. Lifts 5 and 7 have less diversity and are most commonly represented by smooth brome, fringed brome, orchardgrass, Texas timothy, alpine timothy, and Kentucky bluegrass. Forbs common to these sites also include western yarrow, pussytoes (*Antennaria* spp.), harebells, strawberry clover (*Trifolium fragiferum*), and dandelion. Mountain figwort (*Scrophularia lanceolata*) can be found on some of the extremely rocky sites with shallow soils.

Lift 4 runs from the Phoenix to the base of Kachina Basin, crossing over more diverse habitats than the other two lifts. These includes rocky outcrops with wild rose (*Rosa woodsii*), wild raspberry (*Rubus strigosus*), buffaloberry (*Sheperdia canadensis*), rockspirea (*Holodiscus dumosus*), and mountain snowberry (*Symphoricarpos oreophilus*). Lift 4 also crosses over wetter sites that have dense moisture loving shrubs such as willows (*Salix* spp.), shrubby cinquefoil (*Potentilla fruticosa*), and elderberry.

Towers for all three lifts would be reengineered and would likely be in different locations than the current tower bases. The number of towers would be similar for lifts 4 and 7, while Lift 5 would likely have fewer than the existing lift. Since the lift corridors have already been cleared, there would be little disturbance to the vegetation that has reestablished on the slope.

Figure 19. View of the existing Chair 4 about midway down the slope

Wildlife species within the TSV permit area that utilize herbaceous forage will frequent these clearings along with the ski trails. Avian species such as blue grouse (*Dendragapus obscurus*) will consume forbs and grasses for green matter as well as berries and rose hips. Passerine birds

will feed on insects and seed heads. The only confirmed ground nesting bird found using the dense grassy areas is the American pipit (*Anthus rubescens*).

Parking Lot Reconfiguration and Guest Drop-Off Areas

The existing conditions in the parking areas are paved parking lots and transportation routes with narrow tree islands between the parking areas. These narrow strips provide little meaningful wildlife habitat outside of some potential passerine bird nesting. Their greatest value is to provide a filtration zone to collect runoff sediments from the parking areas and prevent their migration into the aquatic system.

Environmental Consequences

Alternative 1 – No Action

Alternative 1 is a true no action alternative and reflects a continuation of existing operations and management practices at TSV without major changes, additions, or upgrades on NFS lands. Alternative 1 would have no direct or indirect impacts on any federally listed, R3 sensitive or rare plant or animal species or MIS animal species. Species with potential to be affected by alternatives 2 and 3 are discussed in detail below.

Federally Listed Threatened, Endangered, and Proposed Species

Threatened, endangered, and proposed animal and plant species are managed under the authority of the Federal Endangered Species Act (ESA), (P.L. 93-205, as amended in 1973) and the National Forest Management Act (P.L. 94-588). The following are federally listed species for Taos County taken from the U.S. Fish and Wildlife Service's (USFWS) website and considered in this analysis: Black-footed ferret (*Mustela nigripes*), Southwestern willow flycatcher (SWWF) (*Empidonax traillii extimus*), Mexican spotted owl (MSO) (*Strix occidentalis lucida*), and Mountain plover (*Charadrius montanus*). This list was current as of September 29, 2011. There are no federally listed, endangered, or proposed species with suitable habitat within the proposed project areas and therefore alternatives 2 and 3 would have no effect on these species.

Table 20. Federally listed threatened, endangered, or proposed species considered in the wildlife effects analysis

Species	Legal Status	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
Black-footed ferret (*Mustela nigripes*)	Endangered		X		No suitable habitat for prairie dog towns occurs within the proposed project areas; therefore, there is no potential for black-footed ferret. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis Is required.

Table 20. Federally listed threatened, endangered, or proposed species considered in the wildlife effects analysis

Species	Legal Status	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
Southwestern willow flycatcher (SWWF) (*Empidonax traillii extimus*)	Endangered		X		No suitable SWWF habitat occurs within the proposed project areas. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Mexican spotted owl (MSO) (*Strix occidentalis lucida*)	Threatened		X		No MSO habitat (including mixed conifer) occurs within the proposed project areas. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis required. BIOLOGIST'S NOTE: Spruce-fir riparian vegetation occurs in northwest corner of the TSV permit boundary, along the Rio Hondo. It was questionable as to whether this habitat is considered restricted MSO habitat. The biologist responsible for this report conferred with Eric Hein of the US Fish and Wildlife Service Ecological Services Office in Albuquerque, NM. Mr. Hein concurred that it was not MSO habitat. This area was surveyed in 2010 and 2011 with negative response.
Mountain plover (*Charadrius montanus*)	Proposed		X		The TSV permit area is not within the range of this species. No further analysis required.

Forest Service Regional Sensitive Species

There are 48 species on the USDA Southwestern Region (R3) Regional Forester's Sensitive Species 2007 list that occur on the Carson NF. The forest developed a list that breaks down

species and habitat occurrence by ranger district.[131] Of the 48 species listed, 38 sensitive species have the potential to occur on the Questa Ranger District (RD), with 17 species to be analyzed in detail. All other species on the Regional Forester's list do not occur on the Questa RD.

The species that have the potential to occur on the Questa Ranger District, but are not analyzed in detail either do not have habitat present in the project area or their habitat is present, but not affected by proposed projects. The species without habitat in the project area are as follows: bald eagle (*Haliaeetus leucocephalus*), burrowing owl (*Athene cumicularia hypugaea*), northern leopard frog (*Rana pipiens*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), Sangre de Cristo pea clam (*Pisidium sanguinchristi*), nokomis fritillary (*Speyeria nokomis Nokomis*), cinereus (masked) shrew (*Sorex cinereus cinereus*), dwarf shrew (*Sorex nanus*), white-tailed jackrabbit (*Lepus townsendii campanius*), Gunnison's prairie dog (*Cynomys gunnisoni*), New Mexico meadow jumping mouse (*Zapus hudsonius luteus*) (Federal Candidate species), mink (*Neovison vison energumenos*), spotted bat (*Euderma maculatum*), Pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), Ripley milkvetch (*Astragalus ripleyii*), Arizona willow (*Salix arizonica*), Rio Grande chub (*Gila pandora*), Rio Grande cutthroat trout (*Oncorhynchus clarki virginalis*) (Federal Candidate species), and Rio Grande sucker (*Catostomus plebeius*). The species whose habitat is present, but not affected are as follows: yellow lady-slipper (*Cypripedium parviflorum var. pubescens*) and robust larkspur (*Delphinium robustum*).

Seventeen species are analyzed in detail in the following table.

Table 21. Forest Service sensitive species that may occur on the Questa Ranger District

Species	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
Bald eagle (*Haliaeetus leucocephalus*)		X		This species is recorded as an occasional winter migrant in Taos County. There are no known winter roost sites on or adjacent to the proposed project areas. There is no open water habitat within the TSV permit boundary that is conducive to eagle foraging for aquatic prey base species. The proposed project areas do not support suitable year- round nesting (snag) or winter roosting habitat adjacent streams (open water) with abundant aquatic prey for foraging or nesting. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.

[131] USDA Forest Service, 2007

Table 21. Forest Service sensitive species that may occur on the Questa Ranger District

Species	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
Burrowing owl (*Athene cumicularia hypugaea*)		X		This species is restricted to arid and semi-arid environments. The proposed project areas occur on steep spruce-fir timbered mountain slopes. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Northern leopard frog (*Rana pipiens*)		X		Mapping data from the Museum of Southwest Biology indicates this species and its habitat do not occur within the proposed project areas or at this elevation in the Sangre de Cristo Mountains. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Northern goshawk (*Accipiter gentiles*)	X			Analysis required.
Peregrine falcon (*Falco peregrines*)	X			Analysis required.
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)		X		This species requires riparian vegetation associations of narrow-leaf cottonwood below 7,000’ elevation. The proposed project areas occur above 9,500’ in the spruce-fir vegetation zone. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
White-tailed ptarmigan (*Lagopus leucurcus*)	X			Analysis required.
Boreal owl (*Aegolius funereus*)	X			Analysis required.
Sangre de Cristo pea clam (*Pisidium sanguinchristi*)		X		This species requires aquatic habitat associated with open water (springs, lakes, and wetlands) and emergent grasses. It is only known to occur at one high elevation cirque lake approximately 1.75 miles from the TSV permit boundary. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.

Table 21. Forest Service sensitive species that may occur on the Questa Ranger District

Species	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
Nokomis fritillary (*Speyeria nokomis Nokomis*)		X		This species is most characteristic of streamside meadows, with an abundance of violets in arid and semi-arid landscapes. The proposed project areas occur above 9500' elevation in spruce-fir. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Cinereus (masked) shrew (*Sorex cinereus cinereus*)		X		The masked shrew is restricted to hydrosere or fresh water ponded areas above 9,500' elevation in the Sangre de Cristo and San Juan Mountain (NMDGF 2008). This type of habitat does not occur within the TSV permit boundary or proposed project areas. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Dwarf shrew (*Sorex nanus*)		X		This species utilizes various habitats including rocky areas in subalpine coniferous forest, other types of rock slopes (e.g., with ponderosa pine), sedge marsh, subalpine meadow, dry brushy slopes, arid short grass prairie, dry stubble fields, and pinon-juniper woodland to about 9,000' elevation. The proposed project areas generally occur above 9500', within the spruce-fir. Although there are some rocky and shale habitats within the proposed project areas, it is unlikely this species occurs at this elevation. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Water shrew (*Sorex palustris navigator*)	**X**			Analysis required.
Snowshoe hare (*Lepus americanus*)	**X**			Analysis required.
White-tailed jackrabbit (*Lepus townsendii campanius*)		X		This species inhabits the Great Basin Desert Scrub habitat in New Mexico. The proposed project areas occur in the spruce-fir to alpine tundra vegetation zones. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.

Table 21. Forest Service sensitive species that may occur on the Questa Ranger District

Species	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
Yellow-bellied marmot (*Marmota flaviventris*)	**X**			Analysis required.
Pika (*Ochotona princes*)	**X**			Analysis required.
Gunnison's prairie dog (*Cynomys gunnisoni*)		X		This species inhabits the high desert grasslands and fields in Northern New Mexico. This habitat does not occur in the TSV permit boundary or the proposed project areas. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Southern red-backed vole (*Clethriomomys gapperi*)	**X**			Analysis required.
Western heather vole (*Phenacomys intermedius intermedius*)	**X**			Analysis required.
Long-tailed vole (*Microtus longicaudus*)	**X**			Analysis required.
New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)		X		This species and the habitat at TSV was discussed with Jennifer Frey who has inventoried this area. It is her opinion that no suitable habitat exists for the NM meadow jumping mouse. She did state the western jumping mouse was found in abundance in some locations. The two species are extreemly difficult to differentiate without DNA analysis. Their habitats however are significantly different. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
American marten (*Martes americana origenes*)	**X**			Analysis required.

Table 21. Forest Service sensitive species that may occur on the Questa Ranger District

Species	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
Ermine (*Mustela erminea murices*)	**X**			Analysis required.
Mink (*Neovison vison energumenos*)		x		Preferred habitat includes thick riparian brush, shrubs, and tall grass for protection from predators. Habitat use focuses on a strip typically 100 ft (30 m) wide from stream or waters edge. Habitat is present adjacent the ski area in along Lake Fork Creek. The area needed for the runnout for the proposed Snow-Tubing area is not adquate to provide suitable habitat for this species.
Spotted bat (*Euderma maculatum*)		X		This species prefers rocky areas for roosting habitat; typically in crevices in cliffs or under loose rocks in proximity of open water such as stock ponds. The proposed project areas are not near preferred roosting habitat for this species. Foraging habitat of open meadows surrounded by forest occur within and in abundance adjacent the proposed project areas. Removal of tree canopy associated with the proposed projects would not impact overall foraging for this species. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)		X		Distribution of this species is dependent upon the presence of caves and similar structures such as abandoned mine adits for suitable roost and hibernation sites. The likelihood of this species being found in or adjacent to the proposed project areas is very low, due to the absence of nearby open mine adits or caves for roost sites to support foraging activities. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*)	**X**			Analysis required.
Canada lynx (*Lynx Canadensis*)	**X**			Analysis required.

Table 21. Forest Service sensitive species that may occur on the Questa Ranger District

Species	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
Ripley milkvetch (*Astragalus ripleyii*)		X		This species is found in sagebrush and ponderosa pine vegetation types at elevations below 8,250'. The proposed project areas occur above 9500' in the spruce-fir to alpine tundra vegetation zones. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Yellow lady-slipper (*Cypripedium parviflorum var. pubescens*)			X	This species is in the Orchidaceae family. Habitat may be present, however, exceptionally moist, spruce-fir stands are the the key habitat component for the lady-slipper. The most likely area of occurance would be in the proposed Snowshoe Trails site. This area was surveyed as a part of the other wildlife surveys and this species was not observed. However, no surface disturbance activities would occur in ladyslipper habitat. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Pecos fleabane (Erigeron subglaber)	**X**			Analysis required.
Alpine larkspur (Delphinium alpestre)	**X**			Analysis required.
Robust larkspur (*Delphinium robustum*)			X	This species is known to occur in valley bottoms, riparian woodlands, subalpine meadows, and in aspen groves in lower and upper montane coniferous forests at elevations ranging from 7,200' to 11,200'. The proposed project areas occur primarily in previously disturbed (converted to grassland) areas within spruce-fir. Although habitat may be present in the proposed snowshoe trails area, no surface disturbance activities are proposed that could affect the species. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.

Table 21. Forest Service sensitive species that may occur on the Questa Ranger District

Species	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
Arizona willow (*Salix arizonica*)		X		This species is known to occur in well developed riparian wetland soils and is correlated to deep loamy Cumulic Cryaquolls (*Terrestrial Ecosystem Unit* #76) on the Carson NF. This soil type is not found in or adjacent the proposed project areas. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Rio Grande chub (*Gila pandora*)		X		This species occurs below 8,000' elevation in the perennial waters (aquatic habitat) of the Rio Grande. The proposed project areas occur above 9,500'. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Rio Grande cutthroat trout (*Oncorhynchus clarki virginalis*)		X		The Rio Hondo supports predominately rainbow trout (*Oncorhynchus mykiss*). Genetic swamping resulting from the presence of rainbows precludes this section of stream from being suitable habitat for Rio Grande cutthroat. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.
Rio Grande sucker (*Catostomus plebeius*)		X		This species occurs below 9,000' elevation in the perennial waters of the Rio Grande. The proposed project areas occur above 9,500. Implementation of alternatives 2 or 3 would have no effect on this species or its habitat. No further analysis is required.

Table 22. Proposed projects that could potentially affect Forest Service sensitive species

Sensitive Species	Main Street Lift	Ridge Lift	Wild West Glades	Minnesotas Glades	Mountain Bike Trail	Snow-tubing Center	Adventure Center (Snowshoe Trails)	Lift Replace-ments	Drop-Off/ Parking Recon-figuration
Northern goshawk	X	X	X	X			X		
Peregrine falcon			X	X					

Table 22. Proposed projects that could potentially affect Forest Service sensitive species

Sensitive Species	Main Street Lift	Ridge Lift	Wild West Glades	Minnesotas Glades	Mountain Bike Trail	Snow-tubing Center	Adventure Center (Snowshoe Trails)	Lift Replace-ments	Drop-Off/ Parking Recon-figuration
American marten	X	X	X	X	X		X		
Rocky Mountain bighorn sheep	X	X	X					X	
Canada lynx	X	X	X	X					
Yellow-bellied marmot	X	X						X	
Pika	X	X						X	
Ermine	X	X						X	
Pecos fleabane	X							X	
Alpine larkspur	X							X	
White-tailed ptarmigan	X								
Boreal owl			X	X	X			X	
Snowshoe hare	X	X	X	X					
Water shrew						X			
Southern red-backed vole	X	X	X	X					
Western heather vole			X	X	X		X	X	
Long-tailed vole								X	

Northern Goshawk

Northern goshawk is recognized as a forest generalist, requiring a mixture of habitat diversity.[132] The highest potential for habitat exists in ponderosa pine and mixed conifer stands with large

[132] Reynolds et al., 1992; Hoover and Wills, 1987

trees. These birds are also found to a limited extent in aspen and spruce-fir vegetation types. Suitable nesting habitat is found in older aged forests with a high density of large trees and high tree canopy cover interspersed with small openings.[133] An association is often found with shaded, cool, northern exposures of canyons and mountain slopes with rock outcrops or cliffs. Snags, downed logs, woody debris, openings, large trees, herbaceous and shrubby understory, and interspersion of vegetation structural stage are important features as it relates to the presence and condition of prey populations.[134]

Goshawk foraging areas are expansive, with goshawks focusing on foraging in and adjacent to forests. This includes small open meadows near and surrounded by conifer forest or aspen stands. Goshawks take a variety of small mammals and birds that reflect prey abundance, composition, and relative availability; however, the majority of prey (typically birds and small mammals) reside on the ground and in the lower portions of forested canopies.[135] Prey species are primarily made up of small mammals with a large biomass relative to other prey species taken. Prey species include rabbits, hares, squirrels, and grouse.[136]

The TSV permit area is likely to be frequented by the northern goshawk and occasionally used for as foraging habitat. Overall the permit area has very low potential for goshawk nesting. Goshawk surveys were conducted in habitat that had any potential for nest site locations, including the proposed Wild West Glades, Minnesotas Glades, Adventure Center, and Mountain Bike Trail project areas. No goshawks were detected in any of the survey areas and there is a noticeable absence of adequate goshawk prey. Red squirrels are a common prey species for the goshawk. Red squirrel activity was very low throughout the proposed project areas, primarily due to high densities of small diameter trees. The proposed Minnesotas Glades are dense and dominated by small diameter dead trees. The only stand structural conditions that are favorable for goshawk nesting is where the Adventure Center is proposed. However, this area would be near the Village of TSV's sewage treatment plant, maintenance buildings, parking lot, and highway. Goshawks would be unlikely to nest adjacent to this heavily used area. Additionally, a great horned owl was detected while surveying for Mexican spotted owls. Great horned owls would likely prey on any future goshawk nests.

The proposed Minnesotas Glades area was surveyed for both northern goshawk and boreal owl. No occurrences were recorded for either. The goshawk surveys require a thorough coverage of the area twice in the same season. The area was surprisingly quiet during both surveys.

Alternative 2

The proposed Adventure Center contains the best potential goshawk habitat in the project area; alternative 2 would not impact that habitat. The proposed Main Street and Ridge Lift lifts would involve tree clearing (mostly Engelmann spruce) to create approximately 2.3 acres of narrow openings for the lift lines.

Additionally, implementation of the proposed Wild West Glades and Minnesotas Glades would thin stands on approximately 71.9 acres of spruce-fir habitat. Retention of standing dead trees larger than 15 inches in diameter would keep potential cavity nesting habitat for cavity nesting

[133] Id.

[134] Reynolds et al., 1992

[135] Ibid.

[136] Reynolds et al., 1992; Hoover and Wills, 1987

prey species. Even though glading would likely improve habitat for goshawk prey species, it is unlikely to influence the sustained presence of such a large avian predator or future use of the area by goshawks.

Potential goshawk habitat occurs extensively beyond the TSV permit area boundary. The majority being protected wilderness. There are numerous potential breeding sites in several directions, especially down the canyon to the west. The TSV permit area is still likely to be frequented as part of a larger goshawk foraging territory, but there would be no noticeable effect on goshawk prey. The northern goshawk and its habitat would not be negatively affected by alternative 2.

Alternative 3

Under alternative 3, minimal impacts to northern goshawk from the proposed glading are expected to be identical to those discussed above under alternative 2.

Potential goshawk habitat would continue to occur extensively beyond the TSV permit area boundary, with the majority being protected wilderness. The TSV permit area is still likely to be frequented as part of a larger goshawk foraging territory, but there would be no noticeable effect on goshawk prey. The northern goshawk and its habitat would not be negatively affected by alternative 3.

Peregrine Falcon

Suitable foraging habitat for the peregrine falcon exists throughout the TSV permit area. Peregrines may forage up to 12.4 miles from the nest site, but normally stay within 7.5 miles. There is one known peregrine falcon nest site with foraging range that overlaps the proposed project areas.

Alternative 2

Given that the hunting range of this species may exceed 100,000 acres, effects of the proposed projects would not be measurable. The proposed glading projects are likely to provide some increase in prey species locally, but are minor over the larger landscape relative to the peregrine falcon. Implementation of alternative 2 wound not impact the peregrine falcon.

Alternative 3

As mentioned above, the hunting range of this species may exceed 100,000 acres. Thus, the effects of the proposed projects would not be measurable. The proposed glading projects are likely to provide some increase in prey species locally, but are minor over the larger landscape relative to the peregrine falcon. Implementation of alternative 3 wound not impact this peregrine falcon.

American Marten

The distribution of American marten in North America extends from the northern limit of coniferous forests to the south in the montane extensions of coniferous forests, including southern Sierra Nevada, northern New Mexico, and east into Illinois, Ohio, and Pennsylvania.[137] In a review of historical records, Findley and others (1975) stated martens were first found and

[137] Buskirk, 2002

described in New Mexico in the Sangre de Cristo Mountains in 1932.[138] Martens have been observed on the Carson NF near Lost Lake (1961), Williams Lake (1962), and in the Taos Ski Valley (up to the present).

Surveys on the Carson NF for the presence of marten were conducted from 1997 to 2001.[139] Marten presence as indicated from track sign and visual sign was found from the mouth of Arroyo Hondo Canyon to the spruce-fir habitat type above Taos Ski Valley to the Williams Lake area. The tracks and visual observation in the Arroyo Hondo Canyon are adjacent to the TSV permit area. Also one marten that was radio collared was tracked sufficiently to determine a home range that overlaps a majority of the proposed project areas. These surveys indicate regular use of the area as habitat for martens.

Martens select moist site conifer stands with abundant coarse woody debris and lengthy fire-return intervals.[140] Citing other research, Buskirk stated there is a high association of marten presence in boreal forests, where spruce is dominant with large diameter trees (vegetation structural stage 4 and 5), high canopy cover, and within 328 feet (100 meters) of a perennial stream at high elevations.[141] Cavities caused by decay in these mid-age and mature areas are important to marten for dens and resting sites.[142] Finch (1992) stated martens principally use spruce-fir forest with a canopy cover of 50 percent or greater, copious amounts of large diameter snags, deadfalls, and rock slides.[143]

Martens prefer areas with low overhead cover for hunting and travel and are thought to be also important for predator avoidance. Martens are noted to have s higher mortalities in clearcuts or heavily logged forests, versus uncut forests, which may help to explain why martens expand their home range into forested areas with greater than 30 percent cover in an effort to avoid risk of predation.[144] Hargis and Bissonette (1995) suggest the threshold for marten abandonment of habitat occurs when forest landscape openings are more than 35 percent of the landscape.[145] The entire analysis area is suitable, but certainly not optimal habitat for marten. Most stands between ski trails are dominated by vegetation structural stage (VSS) 2 and 3, with limited VSS 4 and rarely VSS 5.

Alternative 2

The proposed projects that could have effects on the marten are Main Street Lift, Ridge Lift, Wild West Glades, and Minnesotas Glades. The two lifts would remove up to 2.3 acres of forested foraging habitat; however, the large woody debris along the edges of the cleared trails would increase and provide habitat for voles, which are prey for marten. The Wild West Glades proposal

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[138] Findley et al., 1975

[139] Long, 2001

[140] Buskirk, 2002

[141] The distribution of vegetation structural stages for ponderosa pine, mixed-conifer, and spruce-fir is 10% grass/forbes/shrub (VSS 1), 10% seedling-sapling (VSS 2), 20% young forest (VSS 3), 20% mid-aged forest (VSS 4), 20% mature forest (VSS 5), 20% old forest (VSS 6). NOTE: The specified percentages are a guide and actual percentages are expected to vary + or - up to 3%. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev7_014246.pdf

[142] Schumacher et al., 2000

[143] Finch, 1992

[144] Buskirk, 2002; Bull and Heater, 2001; Thompson, 1994

[145] Hargis and Bissonette, 1995

would thin forested conditions over a total of 31.6 acres. Thinning would be in a mosaic pattern, rather than thinning all of the acres. The thinning and increased snow compaction could increase potential predation and possibly reduce some prey, such as snowshoe hare. On the other hand, thinning would promote transition from the smaller diameter structural classes to larger diameter more suitable structural conditions. Red squirrels are likely to eventually respond to larger structural habitat and improved cone crops.

Currently, there is very little dead and down material that would be increased in quantity, as a result of the proposed projects. In the few areas where larger trees already exist, the spacing is such that very little thinning would be necessary. The recently thinned *North American Glade* shows a noticeable response to understory diversity and productivity. Other prey species that are likely to respond favorably to the increased forage availability from glading would be small mammals, such as deer mice and mountain cottontail.

The proposed Minnesotas Glades covers a total area of 40.3 acres, but its condition is different from the Wild West Glades area; insect infestation has initiated the thinning process. The combination of drought and insects has resulted in mortality of subalpine (corkbark) fir. The overall effects would be similar to the proposed Wild West Glades, except thinning would be primarily cutting down and removing dead trees. The burning of small brush piles would not have any effect on the American marten.[146]

The other proposed projects, such as the Mountain Bike Trail could result in temporary displacement of the marten from human disturbance during the summer and daylight hours, but the long-term habitat conditions would remain the same as the current conditions.

Given the extensive areas of suitable and undisturbed marten habitat adjacent to the TSV permit area, along with its protective wilderness status, the proposed activities within the TSV permit area are relatively minor in context. The American marten and its habitat would not be negatively affected by alternative 2; over and above the existing impacts caused by habitat fragmentation on other ski runs already developed.

Alternative 3

Effects to American marten under alternative 3 from the Wild West Glades and Minnesotas Glades project components are expected to be identical to those discussed under alternative 2. The minimal effects resulting from the Main Street Lift and Ridge Lift would be eliminated.

Given the extensive areas of suitable and undisturbed marten habitat adjacent to the TSV permit area, along with its protective wilderness status, the proposed activities within the TSV permit area are relatively minor in context. The American marten and its habitat would not be negatively affected by alternative 3; over and above the existing impacts caused by habitat fragmentation on other ski runs already developed.

Rocky Mountain Bighorn Sheep

Bighorn prefer precipitous terrain adjacent to suitable feeding sites of high mountain meadows with grasses, forbs, and browse species. Bighorn habitat is found in areas where canopy cover is less than 25 to 30 percent and slopes are greater than 60 percent for escape terrain adjacent to

[146] See discussion in Northern Goshawk section on the effects of pile burning.

grazing areas. Forage, water, and escape terrain are the most important components of bighorn sheep habitat.[147]

Generally, bighorn sheep have two distinct, separate summer and winter ranges. Most of the year is spent on the winter range, where the elevation is typically below 10,826 feet. The aspect is usually south or southwest. Rams often venture onto the more open slopes, although rugged terrain is always nearby. During severe weather, if snow becomes unusually deep or crusty, bighorn sheep move to slightly higher elevations where wind and sunshine have cleared the more exposed slopes and ridges.

In 1993, the New Mexico Department of Game and Fish (NMDGF) transplanted 33 animals from the Pecos herd to the Wheeler Peak Wilderness and adjacent Columbine-Hondo Wilderness Study Area.[148] They have done well and are often seen in the TSV permit area. Sheep were observed during the ptarmigan survey and sheep droppings were wide spread throughout the upper slopes. A salt block intended to improve sheep distribution was found fairly near the radio shack on the ridge and it was being utilized. The NMDGF has been capturing bighorn sheep from the Wheeler Peak area since 2003 to reduce population numbers and to bring the herds within the estimated carrying capacity.

Alternative 2

The proposed projects that could have effects on the bighorn sheep are Main Street Lift, Ridge Lift, Wild West Glades, and replacement of Lift 4. There are signs of sheep use in the upper half of the proposed Main Street Lift area. The effects of construction and operation of the Main Street Lift would be temporary displacement of sheep due the disturbance of construction and grading approximately 0.1 acre of foraging habitat removed for the upper terminal and lift towers.

There is currently no sign of sheep use in the vicinity of the proposed Ridge Lift or in the upper portions of the proposed Wild West Glades. There is evidence of use at the radio shack, which is only a few hundred yards away from the proposed top terminal location. With some additional clearing and reseeding for the upper terminal of the Ridge Lift and thinning in the proposed glade, sheep use is likely to expand at least a short distance down this ridge. The burning of small brush piles would not have any effect on bighorn sheep.[149]

Lift 4 is the only lift location that is likely to have bighorn sheep use. Most of the sign is above the top terminal of this lift, but it is certainly within proximity to be utilized. Especially since there is surface water and willows habitat just down from this area.

Given the extensive areas of suitable terrain and undisturbed bighorn habitat adjacent to the TSV permit area, along with its protective wilderness status, the proposed activities within the TSV permit area are relatively minor in context. The Rocky Mountain bighorn and its habitat would not be negatively affected by alternative 2.

With respect to the species as an MIS, the population trend for bighorn sheep is up on the Carson NF. The proposed projects would not change the quantity of existing forest wide habitat trend or change the existing population trend for bighorn sheep on the Carson NF.

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[147] Van Dyke et al., 2004

[148] NMDGF, 1993

[149] See discussion in Northern Goshawk section on the effects of pile burning.

Alternative 3

Effects to bighorn sheep under alternative 3 from the Wild West Glades and the replacement of Lift 4 project components are expected to be identical to those discussed under alternative 2. The minimal effects resulting from the Main Street Lift and Ridge Lift would be eliminated.

Given the extensive areas of suitable terrain and undisturbed bighorn habitat adjacent to the TSV permit area, along with its protective wilderness status, the proposed activities within the TSV permit area are relatively minor in context. The Rocky Mountain bighorn and its habitat would not be negatively affected by alternative 3. Furthermore, alternative 3 would not change the quantity of existing forest wide habitat trend or change the existing population trend for bighorn sheep on the Carson NF.

Canada Lynx

The Canada lynx was added as a Region 3 sensitive species after it was listed as a candidate species under the Endangered Species Act. The U.S. Fish and Wildlife Service determined the purpose for listing the species in New Mexico within the Distant Population Segment (DPS) was to help the lynx to survive until they return north to Colorado.[150] The agency does not believe habitat components needed by the lynx to survive in the long term are present in New Mexico.[151] The current situation is one of no protective status once an animal crosses the state line into New Mexico. The Canada lynx is largely dependent on snowshoe hare populations for it dietary needs. The snowshoe hare does occur within the TSV permit area and tracks can be observed fairly regularly. However, this is the very southern edge of snowshoe hare range and population numbers are simply too sparse to support sustainable populations of Canada lynx.

Alternative 2

The proposed projects that could have effects on the Canada lynx are Main Street Lift, Ridge Lift, Wild West Glades, and Minnesotas Glades. It is possible the lynx could venture into these proposed activity areas, but would likely return further north in search of adequate populations of its preferred prey, snowshoe hare.

Given the extensive areas of suitable terrain and undisturbed lynx habitat adjacent to the TSV permit area, along with its protective wilderness status, the proposed activities within the TSV permit area are relatively minor in context. The lynx and its habitat would not be negatively affected by either alternative 2.

Alternative 3

Effects to Canada lynx under alternative 3 from the Wild West Glades and Minnesotas Glades project components are expected to be identical to those discussed under alternative 2. The minimal effects resulting from the Main Street Lift and Ridge Lift would be eliminated.

Given the extensive areas of suitable terrain and undisturbed lynx habitat adjacent to the TSV permit area, along with its protective wilderness status, the proposed activities within the TSV permit area are relatively minor in context. The lynx and its habitat would not be negatively affected by alternative 3.

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[150] USFWS, 2009

[151] Hein, 2011

Yellow-bellied Marmot and Pika

Marmots generally require boulders (or a reasonable substitute) for cover and lush herbage for food. Typically they are found in and adjacent to large rock talus or boulder fields adjacent alpine and subalpine grasslands. This species is common throughout the TSV permit area. During a field survey along the ridge from the radio tower above Lift 2 to the proposed Main Street Lift, the abundance of marmots was such that sightings were almost continuous throughout the survey. Although not as abundant as in the higher elevations, sightings of marmots are common on numerous ski trails most of the way down to the base area. The majority of trails has been reseeded for watershed stabilization and has abundant grass cover. Rocky outcrops are less common at the lower elevations, but they seem to be locating the cover type in adequate amounts to occupy these areas.

Pikas generally have habitat requirements very similar to the yellow bellied marmot and often coexist with each other. Within the permit area they do occur in the same high elevation habitats, but only rarely share occupancy on the lower elevations unless there are conspicuous boulder outcrops present.

During ptarmigan surveys a tape was played to solicit ptarmigan response. Both pikas and marmots responded each time the tape was played. Although marmots showed little concern for human presence during survey work, the pikas would surface, chirp a response, and quickly drop back into cover.

The population of marmot, especially down the southwest side of Kachina Peak, was numerous. In fact, any number of local predators could be attracted to the peaks during the summer months for this potential food source.

Alternative 2

The proposed projects that could have effects on the marmot and pika are Main Street Lift, Ridge Lift, and replacement of Lift 4 and 7. It is likely that both yellow-bellied marmot and pika species would be temporarily displaced by lift line construction activity. Between the proposed Main Street Lift and the Ridge Lift there would be approximately 0.35 acre of existing habitat disturbed. A small amount would be permanently occupied by towers and terminals; however, foraging habitat would increase where trees are removed for lift lines. There would also be temporary disturbance and displacement for the proposed lift replacements. The eventual result would be no change in existing habitat conditions. The burning of small brush piles would not have any effect on the marmot or pika.[152]

The proposed activities within the TSV permit area would not negatively affect the yellow-bellied marmot or pika or their habitat.

Alternative 3

Effects to yellow-bellied marmot and pika under alternative 3 from the replacement of lifts 4 and 7 are expected to be identical to those discussed under alternative 2. The minimal effects resulting from the Main Street Lift and Ridge Lift would be eliminated.

[152] See discussion in Northern Goshawk section on the effects of pile burning.

It is likely that both yellow-bellied marmot and pika species would be temporarily displaced by the proposed lift replacements. The eventual result would be no change in existing habitat conditions. The proposed activities within the TSV permit area would not negatively affect the yellow-bellied marmot or pika or their habitat.

Ermine

The ermine is a weasel of high elevations (7,800 to 11,000 feet) in northern New Mexico, where it is associated with microtine (vole) populations in montane meadows.[153] Ermine habitat consists of forest-edge or successional habitats and includes grasslands and shrub, wet meadows, riparian woodlands and rocky areas. They prefer habitats with high prey densities.[154]

This small weasel is distinguished from the long-tailed weasel mainly by the absence of the facial mask. They are likely to occur in the existing ski trails within the TSV permit area. These habitats are favorable to some *Microtus* species and are a preferred prey for the ermine.

Alternative 2

The proposed projects that could have effects on the ermine are Main Street Lift and Ridge Lift, and the replacement of Lift 4, 5, and 7. The total area that could be disturbed during construction of the proposed new lifts is approximately 2.8 acres. With the exception of the terminals and towers, the disturbed area would be reseeded and eventually return to the existing habitat conditions. The conditions in the alpine tundra are such that short growth forms are not adequate to create “runways” common to voles, a prey species for the ermine. The proposed lift locations are also above the elevation preferred by the ermine. All three lift replacements are in habitats that have developed dense grass ground covers that are used by ermine prey species. Prey would likely be temporarily displaced by the proposed lift replacements.

The proposed activities within the TSV permit area would not negatively affect the ermine or its habitat. Implementation of alternative 2 would not negatively affect the ermine or its habitat.

Alternative 3

Effects to ermine under alternative 3 from the replacement of lifts 4, 5, and 7 are expected to be identical to those discussed under alternative 2. The minimal effects resulting from the Main Street Lift and Ridge Lift would be eliminated.

All three lift replacements are in habitats that have developed dense grass ground covers that are used by ermine prey species. Prey would likely be temporarily displaced by the proposed lift replacements. The proposed activities within the TSV permit area would not negatively affect the ermine or its habitat. Implementation of alternative 3 would not negatively affect the ermine or its habitat.

Pecos Fleabane

This plant species occurs on rocky, subalpine, open meadows between 10,000 and 11,500 feet in elevation. The habitat for this species is present, however, no fleabane was observed during the

[153] Findley, 1975

[154] BISON-M, 2008a

surveys conducted at each of the proposed project areas. A key habitat component for the fleabane is exposed rock greater than 50 percent of the surface area.

Alternative 2

The proposed projects that could affect this species are the Main Street Lift and the upper terminal site for the Lift 4 replacement, approximately 0.5 acre of disturbance. Most of the associated habitat for the proposed Main Street Lift is above the preferred elevation for Pecos fleabane. It is also unlikely that any tower locations or even the upper terminal would be located on the rocky outcrops. The upper terminal site for the Lift 4 replacement is mostly disturbed and reseeded habitat. The proposed projects could be mitigated by surveying the site once the proposed tower locations and the top terminal disturbance areas are plotted. If any plants are discovered they would be avoided (especially where pile burning would occur), if technically possible.

There is approximately 3,591 acres of suitable Pecos fleabane habitat in the alpine meadow habitat type adjacent to the permit area within the Wheeler Peak Wilderness. The proposed activities within the TSV permit area would not negatively affect Pecos fleabane.

Alternative 3

Effects to pecos fleabane under alternative 3 from the installation of the upper terminal of Lift 4 are expected to be identical to those discussed under alternative 2. The minimal effects resulting from the Main Street Lift would be eliminated.

The upper terminal site for the Lift 4 replacement is mostly disturbed and reseeded habitat. The proposed projects could be mitigated by surveying the site once the proposed tower locations and the top terminal disturbance areas are plotted. If any plants are discovered they would be avoided (especially where pile burning would occur), if technically possible.

There is approximately 3,591 acres of suitable Pecos fleabane habitat in the alpine meadow habitat type adjacent to the permit area within the Wheeler Peak Wilderness. The proposed activities within the TSV permit area would not negatively affect Pecos fleabane.

Alpine Larkspur

This species occurs on subalpine tundra. No *Delphinium* species were observed during the survey of this habitat type.

Alternative 2

The only proposed projects that could potentially affect this species are the Main Street Lift and the upper terminal of the Lift 4 replacement. Although none were observed in the area, the potential does exist for this species to occur. The amount of potential habitat that could be disturbed is approximately 0.5 acre. The proposed projects could be mitigated by surveying the site once the proposed tower locations and the top terminal disturbance areas are plotted. If any plants are discovered they would be avoided (especially where pile burning would occur), if technically possible.

With a limited amount of potential alpine larkspur habitat that would be affected by the proposed projects, it is unlikely the species would be negatively affected. There is also approximately 3,591 acres of suitable larkspur habitat in the alpine meadow habitat type adjacent to the permit area

within Wheeler Peak Wilderness. The proposed activities within the TSV permit area would not negatively affect alpine larkspur.

Alternative 3

Effects to alpine larkspur under alternative 3 from the installation of the upper terminal of Lift 4 are expected to be identical to those discussed under alternative 2. The minimal effects resulting from the Main Street Lift would be eliminated.

With a limited amount of potential alpine larkspur habitat that would be affected by the proposed projects, it is unlikely the species would be negatively affected. There is also approximately 3,591 acres of suitable larkspur habitat in the alpine meadow habitat type adjacent to the permit area within Wheeler Peak Wilderness. The proposed activities within the TSV permit area would not negatively affect alpine larkspur.

White-tailed Ptarmigan

The habitat for white-tailed ptarmigan is alpine tundra and subalpine deciduous shrub. This area was inventoried for ptarmigan and none were located. Braun (1979) thought the alpine vegetation was in excellent condition, but likewise felt within the Wheeler Peak Wilderness there is a lack of breeding areas and possibly winter use sites, and bush willows were not abundant.

Any ptarmigan utilizing the alpine tundra would depend on the rocky areas for cover. Within the TSV permit area, tundra vegetation is fairly well utilized by both bighorn sheep and marmots. Also the arrangement of key vegetation is less than desirable. The willow (*Salix* spp.) availability is some distance from the upper habitats and occurs only in a small narrow strip below the upper terminal of Lift 4. The juxtaposition arrangement of the willow community does not lend itself to being quality winter habitat.

Alternative 2

The only proposed project that could potentially affect white-tailed ptarmigan is the Main Street Lift. No subalpine deciduous shrub would be affected by the proposal, since the proposed lift would be located on the opposite side of the alpine community from the *Salix*. The presence of the proposed lift would likely result in six or seven towers within the alpine habitat type. The snow gets quite deep and wind packed in this area. It is unlikely that additional compaction from skiing would have any effect on the winter habitat, as the more essential elements of winter habitat are not within the area most likely accessed from this lift.

The other potential effect to the ptarmigan would be a possible collision with lift cables while flying. Even though this could happen, it is not likely to be a limiting factor for occupancy in this area. Even though the estimated potential ptarmigan habitat on the Carson NF is 10,106 acres, Braun's assessment when compared to Colorado was that "overall alpine habitats in New Mexico are marginal for white-tailed ptarmigan breeding and wintering."

The introduction of bighorn sheep in 1993 to this area has been success for that population. Given the marginal nature of ptarmigan habitat within the TSV permit area and the presence of bighorn sheep, the proposed Main Street Lift would not negatively affect ptarmigan or its habitat.

With respect to ptarmigan as a MIS, the impacts of the proposed Main Street Lift are considered inconsequential with regard to the ptarmigan's forest wide habitat and population trend; therefore,

the proposed project would not change the existing quantity of forest wide alpine tundra and subalpine deciduous shrub habitat trend or change the existing forest wide population trend for the ptarmigan.[155]

Alternative 3

None of the proposed projects under alternative 3 would impact white-tailed ptarmigan or their habitat.

Boreal Owl

In 2005, a boreal owl was photographed in the spruce-timber adjacent to Williams Lake attesting to the persistence of this species in the area. Night surveys were conducted in April 2011. The two largest proposed activity areas that might support this species were the proposed glade areas. Based on the preferred habitat descriptions the lowermost portion of the Wild West Glades and the very eastern edge of the proposed Minnesotas Glades were perhaps the best of the potential habitat. Both areas were surveyed. No responses of boreal owls were solicited.

The boreal owl inhabits a variety of forest habitats from deciduous forests to mixed conifer forests and subalpine forests.[156] Southern Rocky Mountain populations tend to occur in high subalpine forests.[157] The boreal owl is known to occupy cool micro sites with high canopy cover, high basal coverage and high tree density.[158] Boreal owls nest in tree cavities that are created naturally by decay or excavated by other birds and animals. They nest where cavity nest sites are available, typically in mature or older forests, sometimes in aspen cavities, or in conifer snags.

Preferred foraging habitat is in mature older forests, especially mature spruce-fir forests.[159] Prey is mainly made up of small rodents, especially red-backed voles. Birds and insects are also part of their diet in small amounts. When red-backed voles are low in population numbers, boreal owls shift to alternative food sources such as shrews (*Sorex* spp.) and small passerine birds.[160]

Although portions of the proposed Wild West Glades and Minnesotas Glades are similar to the desired habitat described above for the boreal owl, the majority of the affected environment within the two areas is dominated by dense small diameter trees. A high number of dead trees are located within the proposed Minnesotas Glades area.

Alternative 2

The proposed projects that could have effects on the boreal owl are Wild West Glades, Minnesotas Glades, Mountain Bike Trail, and lift replacements. The proposed lift replacements would result in initial disturbance for a year or two, but would not alter the boreal owl habitat from its current condition.

Implementation of proposed glade projects would reduce the standing dead material, but would have no effect on habitat as it relates to snags and trees that may provide cavities for nesting.

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[155] USDA Forest Service, 2011

[156] Hayward, 1997

[157] Hayward, 1994

[158] Hayward, 1997

[159] Ibid.

[160] Hakkarainen, 1996

Thinning would increase herbaceous forage and coarse woody debris on the ground. It would also promote a more rapid progression to larger diameter trees. Or in the case of the proposed Minnesotas Glades, it could reduce the chances of a catastrophic crown fire. Thinning would also increase the amount of dead and downed material available for prey species habitat and would in effect improve prey availability. The burning of small brush piles would not have any effect on the boreal owl.[161]

A limited amount clearing would be required to create the proposed Mountain Bike Trail in the wooded areas. Most trees could be avoided in the layout of the narrow trail. The work would mostly be trimming of lower limbs, removing downed material, and cutting a path through any larger downed logs. Most of this type of work would be to the east of Al's Run. There are a couple of places between Al's Run and Porcupine that would require some clearing, where the route would not follow existing access trails.

The effects of the proposed Mountain Bike Trail on the boreal owl would primarily be from disturbance created by the presence of a biker, resulting in temporary displacement from the area near the trail. A longer duration of displacement and larger area of avoidance would likely occur during a mountain biking event, when increased use would take place. Any displacement would mainly affect larger animals such as big game and predators.

There is currently a fairly high degree of activity and human presence associated with normal year-round operations at TSV. It is unlikely habitats selected by boreal owls for nesting would occur within the permit area. On the other hand, the observation in 2005 was located along a popular hiking trail to Williams Lake, within Wheeler Peak Wilderness.

The proposed activities within the TSV permit area would not negatively affect the boreal owl or its habitat and would be beneficial toward its principal prey species (red-backed vole) habitat by increasing the amount of dead and downed material.

Alternative 3

Effects to boreal owl under alternative 3 from the Wild West Glades, Minnesotas Glades, Mountain Bike Trail, and lift replacement project components are expected to be identical to those discussed under alternative 2.

The proposed activities within the TSV permit area would not negatively affect the boreal owl or its habitat and would be beneficial toward its principal prey species (red-backed vole) habitat by increasing the amount of dead and downed material.

Snowshoe Hare

Snowshoe hare, within New Mexico, is restricted to the Sangre de Cristo and San Juan Mountains.[162] This species is a habitat specialist confined largely to mid to high elevation boreal and subalpine spruce-fir forests at 9,800 to 12,000 feet (2,987 to 3,657 meters) in elevation in New Mexico.[163]

[161] See discussion in Northern Goshawk section on the effects of pile burning.

[162] NMDGF, 2008b

[163] Ellsworth and Reynolds, 2006; Malaney and Frey, 2006; Findley et al., 1975

Snowshoe hares forage on a variety of plants for food, including conifer buds and twigs; buds, branches, leaves, and fruits of shrubs and forbs and to a limited extent leaves of some grasses.[164] Conifers are the primary source of food in winter and the hare eats more herbaceous foods in the summer.[165] Snowshoe hares prefer forests with a dense understory of shrubs and forbs and associated dense forest cover (i.e., downfall, shrubs, rotten logs) for shelter and protection against predation.[166] Snowshoe hare abundance has been found to be high in forest stands with trees of 9 to 16 inches diameter at breast height (dbh) (22.9 to 40.6 cm).[167]

Spruce-fir forests meet cover needs since these species of trees often retain their lower branches and provide effective cover for snowshoe hares.[168] Predators of this species include owls, black bear, coyotes, pine marten, bobcats, and lynx. Snowshoe hare generally do not venture far into sparse forests or meadows, due to exposure to avian predation.[169] Dense forest areas provide soft deep snow in which predators such as coyotes and bobcats have difficulty moving, thus allowing the snowshoe hares to maintain relative survival security during winter. However, compacted ski runs, roads, cross-country ski trails, and windblown packed snow provide new avenues for predators that are normally not present in snowshoe hare winter habitats and result in increased mortality for this species.[170]

Home ranges of snowshoe hare may be from 12 to 24 acres (5 to 0 ha).[171] According to NatureServe (2008), in Colorado and Utah the average home range size for this species is 20 acres. Snowshoe hares are non-migratory and usually occupy the same area throughout the year.[172] Snowshoe hare tracks are regularly observed on ski slopes at Taos Ski Valley during winter.

Clearcutting tree canopy begins to limit the movement of snowshoe hares. Observations on existing ski runs at Taos Ski Valley have shown snowshoe hare tracks are more often noted under the ski lift, where a narrow corridor of forest has been cleared. These tracks appear to go from forested area to forested area. Snowshoe hare tracks typically only venture out from the edges of forested areas in large cleared ski runs and usually show a return route back to the forest stand of origination or the next nearest adjacent forest stand, indicating the preference snowshoe hares have for the protective cover of uncut forested areas.

Alternative 2

The proposed projects that could have effects on the snowshoe hare are the Main Street Lift, Ridge Lift, Wild West Glades, and Minnesotas Glades. The two lifts would remove up to 2.3 acres of forested habitat. The construction of the Ridge Lift would result in clearing a strip approximately 40 feet wide, totaling about 0.3 acre. The resulting area would be more rocky outcrops than grasslands. The bottom terminal of the Main Street Lift would remove about

[164] NMDGF, 2008b; Ellsworth and Reynolds, 2006

[165] Ellsworth and Reynolds, 2006

[166] NMDGF, 2008b; Ellsworth and Reynolds, 2006

[167] Ellsworth and Reynolds, 2006

[168] Ibid.

[169] Bull et al., 2005

[170] Ellsworth and Reynolds, 2006; Buskirk, 2002

[171] Ellsworth and Reynolds, 2006

[172] Ibid.

0.4 acre of forested habitat most of which could be reseeded to grasslands. Removal of the trees for the Main Street Lift line would result in converting approximately 1.2 acres of sub-alpine forested habitat to high mountain grassland habitat. The area cleared for this lift-line would be a maximum of 60 feet wide. The snowshoe hare is not likely to avoid crossing these openings.

The Wild West Glades proposal would thin forested conditions over a total of 31.6 acres. Thinning and more snow compaction could increase potential predation; however, a mosaic pattern would leave areas of low limbs and branches for cover and escape habitat. On the other hand thinning (glading) would promote transition from the smaller diameter VSS classes to larger diameter more suitable structural conditions.

Currently there is very little dead and down material that would increase as a result of thinning (glading) activities. In the few areas where larger trees already exist, the spacing is such that very little thinning would be necessary. The recently gladed *North American* shows a noticeable response to understory diversity and productivity. Other prey species that are likely to respond favorably to the increased forage availability would be small mammals such as deer mice and mountain cottontail. The burning of small brush piles would not have any effect on the snowshoe hare.[173]

The proposed Minnesotas Glades covers a total area of 40.3 acres, but its condition is different from the Wild West Glades area, as nature has initiated its own thinning process. The combination of drought and insects has resulted in mortality of subalpine (corkbark) fir. The overall effects would be similar to the proposed Wild West Glades, except thinning would be primarily cutting down and removing dead trees. Most of the standing dead trees are close together and have very few lower branches that could serve as cover for the hare. There are already indications of increased shrub response that could provide similar cover attributes over time.

Given the extensive areas of suitable and undisturbed snowshoe hare habitat adjacent to the TSV permit area, along with its protective wilderness status, the proposed activities within the TSV permit area are relatively minor in context. The snowshoe hare and its habitat would not be negatively affected by proposed activities over and above existing impacts caused by habitat fragmentation on other ski runs already developed.

Alternative 3

Effects to snowshoe hare under alternative 3 from the Wild West Glades and Minnesotas Glades project components are expected to be identical to those discussed under alternative 2. The minimal effects resulting from the Main Street Lift would be eliminated.

Given the extensive areas of suitable and undisturbed snowshoe hare habitat adjacent to the TSV permit area, along with its protective wilderness status, the proposed activities within the TSV permit area are relatively minor in context. The snowshoe hare and its habitat would not be negatively affected by proposed activities over and above existing impacts caused by habitat fragmentation on other ski runs already developed.

[173] The burning of small brush piles would not have any effect on the northern goshawk.

Water Shrew

This species occurs in the vicinity of permanent streams at 8,000 feet (2,438 meters) in elevation and above. Habitat use is typically found ranging from the water's edge or within 10 feet (3 meters) of the water's edge. This species is closely associated with water and dense streamside vegetation in subalpine coniferous forest.

Alternative 2

The only proposed project in close association to water is the proposed Snowtubing Center in the base area. This is where Strawberry Hill, the current beginner area is located. The proposal is to convert the hill, which lies mostly on TSV property to a snowtubing area. Three tubing runs made of snow would cross the Rio Hondo on the old "boxcar bridge." New disturbance of around 0.7 acre would be required for the run out on the north side of the creek, which is located on NFS lands. The area would have to be cleared and graded to the proper slope and revegetated with a native seed mix. This area is adjacent to the parking lot.

Implementation of the snowtubing run could result in displacement of any water shrews that might inhabit this area; however, disturbance would be adjacent to an area where streamside vegetation has already been impacted by the parking lot and displacement has likely already occurred. Streamside vegetation downstream is intact and will continue to provide potential water shrew habitat. The proposed snowtubing run would not have a negative effect on the water shrew.

Alternative 3

None of the project included in alternative 3 have potential to impact water shrew or habitat.

Southern Red-backed Vole

This species occurs in the spruce-fir forested habitat. Downed woody debris is an important feature for this species. This is an important prey species for American marten and boreal owl.

Alternative 2

The proposed projects that could have effects on the southern red-backed vole are the Main Street Lift, Ridge Lift, Wild West Glades, and Minnesotas Glades. Both the Main Street Lift and the Ridge Lift proposals would convert spruce-fir forest habitat to mountain grasslands. The lift clearing would be narrow enough that the red-backed vole should continue to inhabit or use these areas. Implementation of both lifts would increase the amount of large woody material along the forest edge of the lift-line clearings, which would provide improved habitat conditions for the species (see discussions in boreal owl and marten).

The proposed Wild West Glades and Minnesotas Glades should retain habitat conditions favorable to the red-backed vole. There would also be an increase in downed woody material associated with the thinning. The burning of small brush piles would not have any effect on the vole. The southern red-backed vole and its habitat would not be negatively affected by proposed activities.

Alternative 3

Effects to southern red-backed vole under alternative 3 from the Wild West Glades and Minnesotas Glades project components are expected to be identical to those discussed under alternative 2. The minimal effects resulting from the Main Street Lift would be eliminated.

The proposed Wild West Glades and Minnesotas Glades should retain habitat conditions favorable to the red-backed vole. There would also be an increase in downed woody material associated with the thinning. The burning of small brush piles would not have any effect on the vole. The southern red-backed vole and its habitat would not be negatively affected by proposed activities.

Western Heather Vole

Western heather voles are known to occur in mountains near or above timberline. In New Mexico, the vole is found in the Sangre de Cristo and the San Juan Mountains, generally at high elevations.[174] They can be found at elevations ranging from 7,000 to 12,500 feet above sea level. They seem to prefer open coniferous forests with an understory of heaths, areas with shrubby vegetation on forest borders, or in meadows, and usually close to water. Heather voles on the Carson Nation Forest may be found in the upper mixed conifer and riparian boreal habitat.[175]

The heather vole has different nesting areas depending on the time of year. In the summer, they live in short, underground burrow systems.[176] The opening is usually covered by vegetation or leaf litter, and the nest is generally made of lichens, grasses, or other types of vegetation. In the winter, the nests are above ground and have thicker insulation, constructed of lichen, twigs, and lined with grasses. These nests can be located under shrubs, logs, stumps, or rocks.

Given the wide variety of habitats enjoyed by the heather vole is could occur in the vicinities of several proposed project areas. Most likely are the zones along the edges of forested areas and heavily vegetated ski trails. These edges would provide the greatest degree of diversity that is likely to satisfy the needs of this species.

Alternative 2

The proposed projects that could have effects on the western heather vole are the Wild West Glades, Minnesotas Glades, and lift replacement lifts. The proposed lift replacements are located centrally in the cleared areas of the trails. Even though the species is more likely to use the edges and not be affected, the vegetation (grasses) is dense in most areas of the existing lifts. There is a possibility for disturbance and temporary displacement during construction. These areas would return to existing conditions within a couple of years.

The proposed glade areas are probably very marginal habitats at this time, but would likely improve after glading. Both areas would likely show increases in herbaceous cover and shrubs. This is based on the response in the recently thinned *North American Glade*. There would also be an increase in large woody material on the forest floor. The burning of small brush piles would not have any effect on the heather vole. The western heather vole and its habitat would not be negatively affected by proposed activities.

Alternative 3

Effects to western heather vole under alternative 3 from the Wild West Glades, Minnesotas Glades, and lift replacement project components are expected to be identical to those discussed

[174] BISON-M, 2008c

[175] Frey, 2003

[176] McAllister et al., 1988

under alternative 2. The western heather vole and its habitat would not be negatively affected by proposed activities.

Long-tailed Vole

The long-tailed vole is largely dependent on well developed, moderately moist meadows and can be found in a variety of elevation ranges. Populations fluctuate dramatically. The long-tailed vole burrows in the soil and requires well drained soils.[177]

Alternative 2

Dense grassland meadows are associated with the locations proposed lift replacement projects; however, these are generally not mesic (moderately moist). A very limited amount of well developed wet meadow habitat is found within the TSV permit area. There is some in the vicinity of Lift 4, but is not directly in the lift alignment. The lift replacement would not affect this long-tailed vole habitat. Existing long-tailed vole and its habitat would not be negatively affected by proposed activities.

Alternative 3

Effects to long-tailed vole under alternative 3 from the replacement of Lift 4 are expected to be identical to those discussed under alternative 2. Existing long-tailed vole and its habitat would not be negatively affected by proposed activities.

Management Indicator Species

Management indicator species (MIS) were identified during the 1986 Carson Forest Plan. The plan identifies specific MIS with habitats that can best be used to analyze the effects of management activities on the Carson NF. Management indicator species are defined in the Carson Forest Plan as, "[t]hose species selected in the planning process to monitor the effects of planned management activities on viable populations of all wildlife and fish species, including those species that are socially or economically important."[178] The Carson forest plan identifies nine wildlife species and two wildlife species groups as management indicator species. These species and their habitats are:

[177] BISON-M, 2008b

[178] USDA Forest Service, 1986c glossary p. 301

Table 23. Management indicator species and habitats

MIS	Indicator Habitat
Hairy woodpecker	snags
Wild turkey	old growth pine (roost tree, roost tree groups)
White-tailed ptarmigan	alpine tundra, subalpine deciduous shrub
Plain titmouse	piñon-juniper canopies
Brewer's sparrow	sagebrush
Abert's squirrel	interlocking canopies
Red squirrel	mixed conifer
Elk	general forest
Bighorn sheep	alpine, subalpine tundra mountain meadow grassland
Resident trout	perennial stream, riparian
Aquatic macro-invertebrates	perennial stream, riparian

All 11 MIS were considered for this analysis. Given the habitat types and effects on these habitats within the proposed project areas, bighorn sheep, white-tailed ptarmigan, elk, hairy woodpecker, resident trout, and aquatic macro-invertebrates will be analyzed as management indicator species. Plain titmouse, Brewer's sparrow, Abert's squirrel, and red squirrel indicator habitat is not present within the TSV permit area. It should be noted that red squirrel is a MIS and does occur in TSV permit area. It also has management objectives within TSV with regard to prey base for the northern goshawk and American marten, both Forest Service sensitive species discussed in the previous section. However, this species is an indicator for mixed conifer habitat and no mixed conifer habitat occurs within the TSV permit area. Therefore none of the proposed projects would alter the mixed conifer habitat trends on the Carson NF.

Table 24. Proposed projects that could potentially affect management indicator species

MIS	Main Street Lift	Ridge Lift	Wild West Glades	Minnesotas Glades	Mountain Bike Trail	Snowtubing Area	Lift Replacement	Drop-Off & Parking Reconfig
Bighorn sheep	X	X	X				X	
Ptarmigan	X							
Hairy woodpecker	X	X	X	X	X			
Elk	X	X	X	X	X		X	
Resident trout						X		X
Aquatic macro-invertebrates						X		X

Bighorn Sheep

The MIS habitat attribute for which the bighorn is evaluated is alpine, subalpine tundra mountain meadow grassland. As mentioned previously, 33 animals from the Pecos herd were transplanted to the Wheeler Peak Wilderness and adjacent Columbine-Hondo Wilderness Study Area in 1993.[179] They have done well and the NMDGF has been capturing bighorn sheep from the Wheeler Peak Wilderness since 2003, to reduce population numbers and to bring the herds within the estimated carrying capacity. The proposed projects that could have effects on the bighorn are Main Street Lift, Ridge Lift, Wild West Glades, and replacement of Lift 4. Refer to the discussion above for a detailed discussion of bighorn sheep.

Alternative 2

There are signs of sheep use in the upper half of the proposed Main Street Lift area. The Main Street Lift would be accessed from the top of Lift 4 by skiing across *Easy Trip* to the entrance of *Hunziker*. The proposed lift would be approximately 2,200 feet long and climb approximately 1,100 feet in elevation. The base of the proposed lift would be on a rocky tree covered knoll and would run southward to a small depression just below Kachina Peak. The top terminal is in the alpine tundra habitat. The effects of construction and operation of the Main Street Lift would be temporary displacement of sheep due the disturbance of construction and grading approximately 0.1 acre of foraging habitat removed for the upper terminal and lift towers. The rocky outcrop or hill at the base of where the bottom terminal would be located is primarily covered with Engelmann spruce and whortleberry. Most of the vegetation would be removed for the construction of the base terminal. A strip of trees just above the base would also have to be cleared for several hundred feet. Between the bottom terminal and the lift-line there would be about 1.6 acres of tree removal. Grading at the bottom terminal is estimated at 0.7 acre.

The proposed Ridge Lift is located in West Basin and would start a few hundred feet below the top of Lift 8. It would be approximately 800 feet long, gaining approximately 560 feet of elevation, terminating at the top of the ridge line. It would provide access to expert skiing off the West Basin Ridge and to the proposed Wild West Glade. The proposed lift would require clearing of approximately 0.7 acre mostly of Engelmann spruce and cork-bark fir. Grading and contouring of the rocky area at the base terminal could also be about the same.

There is currently no sign of sheep use in the vicinity of the proposed Ridge Lift or in the upper portions of the proposed Wild West Glades. There is evidence of use at the radio shack, which is only a few hundred yards away from the proposed top terminal location. With some additional clearing and reseeding for the upper terminal of the Ridge Lift and thinning in the proposed glade, sheep use is likely to expand at least a short distance down this ridge.

Lift 4 is the only chair location that is likely to have bighorn sheep use. Most of the sign is above the top terminal of this lift, but it is certainly within proximity to be utilized. Especially since there is surface water and willows habitat just down from this area. The population trend for bighorn sheep is up on the Carson NF. The proposed action would not change the trend, quantity or the quality of habitat on the Carson NF.

[179] NMDGF, 1993

Alternative 3

Lift 4 is the only location that is likely to have bighorn sheep use within the alternative 3 project area. Most of the sign is above the top terminal of this lift, but it is certainly within proximity to be utilized. Especially since there is surface water and willows habitat just down from this area. The population trend for bighorn sheep is up on the Carson NF. The proposed action would not change the trend, quantity or the quality of habitat on the Carson NF.

Ptarmigan

The MIS habitat attribute for which the ptarmigan is evaluated is alpine tundra, subalpine deciduous shrub. The only proposed project that could affect ptarmigan habitat is the Main Street Lift. The area where the Main Street Lift is proposed was inventoried for ptarmigan and no ptarmigan were located. Nevertheless there is alpine habitat in the upper portion of the proposed project area. Refer to the discussion above for a discussion of white-tailed ptarmigan.

Alternative 2

Any ptarmigan utilizing the alpine tundra would depend on the rocky areas for cover. Within the TSV permit area, tundra vegetation is fairly well utilized by both bighorn sheep and marmots. Also the arrangement of key vegetation within the entire krummholz mosaic is less than desirable. The willow (*Salix* spp.) availability is some distance from the upper habitats and occurs only in a small narrow strip below the upper terminal of Lift 4. The juxtaposition arrangement of the willow community does not lend itself to being quality winter habitat. No subalpine deciduous shrub would be affected by the proposal, since the proposed lift would be located on the opposite side of the alpine community from the *Salix*. Any ptarmigan utilizing this area would depend on the rocky areas for cover. The tundra vegetation is fairly well utilized by both bighorn sheep and marmots.

The presence of the proposed Main Street lift would likely result in six or seven towers within the alpine habitat type. The snow gets quite deep and wind packed in this area. It is unlikely that additional compaction from skiing would have any effect on the winter habitat, as the more essential elements of winter habitat are not within the area most likely accessed from this lift.

The impacts of the proposed Main Street Lift is inconsequential with regard to the ptarmigan's forestwide habitat and population trend; therefore, the proposed project would not change the existing quantity of forestwide alpine tundra and subalpine deciduous shrub habitat trend or change the existing forestwide population trend for the ptarmigan.[180]

Alternative 3

None of the proposed projects under alternative 3 would affect ptarmigan or ptarmigan habitat.

Hairy Woodpecker

The habitat attribute for which hairy woodpecker is evaluated is snags. The Carson Forest Plan forest wide prescriptions states, "at least 300 snags per 100 acres on 60 percent of suitable timberlands be retained, not determined by interdisciplinary team review to be highly vulnerable to fuelwood collection. The guideline for the minimum size for snags is: Conifers – 12 inch dbh

[180] USDA Forest Service, 2011

and 15 feet tall. Aspen – 10 inch dbh and 12 feet tall."[181] The proposed projects that could have effects on the hairy woodpecker are Main Street Lift, Ridge Lift, Wild West Glades, Minnesotas Glades, and Mountain Bike Trail.

Alternative 2

The proposed projects that could have effects on the hairy woodpecker are Main Street Lift, Ridge Lift, Wild West Glades, Minnesotas Glades, and Mountain Bike Trail.

Tree mortality in the proposed Main Street Lift and Ridge Lift locations is quite low. There are several snags along the proposed lift lines that would be removed. No snags greater than 10 inches dbh would need to be removed to thin the Wild West Glades area. Thinning smaller diameter live trees would reduce the competition allowing for eventual larger trees, which in turn would eventually provide for a more effective and desirable snags.

As stated in other sections, the mortality of cork-bark fir in the proposed Minnesotas Glades area is massive. Although it varies across the hillside, it is estimated to range from 40 percent along the eastern edge to in excess of 90 percent in the central portion of the slope. A standing dead tree is not necessarily a "snag" for management purposes. Because of the high density prior to the mortality event, most trees were of a small diameter. The majority of the standing dead are less than 10 inch dbh. With a few exceptions this project could be accomplished by simply thinning out the smaller dead material. No snags or live trees greater than 10 to 12 inches dbh would need to be removed to glade this area, unless for safety reasons. The total glading area would be approximately 40.3 acres. The burning of small brush piles would not have any effect on the hairy woodpecker.[182]

No snags or live trees greater than 10 to 12 inches dbh would need to be removed to construct the Mountain Bike Trail.

This action is inconsequential with regard to the hairy woodpecker's forest wide habitat and population trend; therefore, the proposed projects would not change the quantity of available forest wide snag habitat or forest wide population trends for the hairy woodpecker.[183]

Alternative 3

Effects to hairy woodpecker under alternative 3 from the Wild West Glades and Minnesotas Glades project components are expected to be identical to those discussed under alternative 2. The minimal effects resulting from the Main Street Lift would be eliminated.

This action is inconsequential with regard to the hairy woodpecker's forest wide habitat and population trend; therefore, the proposed projects would not change the quantity of available forest wide snag habitat or forest wide population trends for the hairy woodpecker.[184]

[181] USDA Forest Service, 1986c p. Wildlife & Fish – 8

[182] See discussion in Northern Goshawk section on the effects of pile burning.

[183] USDA Forest Service, 2011

[184] Ibid.

Elk

The habitat attribute for which elk is evaluated is general forest. Elk are considered to occur throughout nearly all of the Carson NF. The proposed projects that could have effects on elk are Main Street Lift, Ridge Lift, Wild West Glades, Minnesotas Glades, lift replacements, and Mountain Bike Trail.

Alternative 2

The proposed projects that could have effects on elk are Main Street Lift, Ridge Lift, Wild West Glades, Minnesotas Glades, lift replacements, and Mountain Bike Trail.

The proposed Main Street Lift and Ridge Lift would convert 1.6 acres of habitat from a cover type to a forage type. The amount of habitat lost to terminals and towers would be minor when compared to the total Carson NF acres.

The proposed Wild West Glades area does provide both hiding and thermal cover, but is very low on desirable forage. Glading the area would increase forage and still provide hiding cover. The thermal cover attributes would decrease. Overall the uses may vary but it would still provide elk habitat.

The proposed Minnesotas Glades area does provide both cover and forage. It is already showing an increase in desirable forage as increased light is reaching the forest floor. Glading would further increase forage and still provide zones hiding cover. The thermal cover attributes have decreased with the extensive tree mortality. Overall the uses may vary, but it would still provide elk habitat.

The current elk habitat in the clearings for the existing lift-lines is for foraging. There would be a temporary loss of foraging habitat during replacement of the lifts of approximately 2.53 acres. These disturbed areas would be reseeded and should be similar to the existing conditions within a couple of years. The amount of habitat lost to terminals and towers would be minor when compared to the total Carson NF acres.

The entire proposed Mountain Bike Trail route is considered suitable elk habitat. No elk or droppings were observed during the survey of this area. There would be a very few small diameter trees that would be removed or trimmed to allow for the bike trail.

The effects of the proposed new lifts, gladed runs, lift replacements, and Mountain Bike Trail are inconsequential with regard to elk's forest wide habitat and population trends; therefore, the proposed projects would not change the forest wide general forest habitat trend or population trend for the elk.[185]

Alternative 3

Effects to elk under alternative 3 from the Wild West Glades, Minnesotas Glades, lift replacements, and Mountain Bike Trail project components are expected to be identical to those discussed under alternative 2. The minimal effects resulting from the Main Street Lift would be eliminated.

[185] Ibid.

The effects of the proposed gladed runs, lift replacements, and Mountain Bike Trail are inconsequential with regard to elk's forest wide habitat and population trends; therefore, the proposed projects would not change the forest wide general forest habitat trend or population trend for the elk.[186]

Resident Trout and Aquatic Macro-invertebrates

The habitat attributes for which resident trout and aquatic macro-invertebrates are evaluated are perennial streams and riparian habitat. The proposed projects that could have effects on resident trout and aquatic macro-invertebrates are the Snowtubing Center and parking reconfiguration and East Guest Drop-Off Area.

The proposed run out for the snowtubing area is adjacent to both sides of the Rio Hondo. The stream does have a population of primarily rainbow trout with some evidence of cutbow still in the system. The proposed reconfiguration of parking and transportation could result in some tree removal between the existing parking lots. These areas do serve as filtration zones and can help reduce the runoff of surface sediments.

Alternative 2

The proposed projects that could have effects on resident trout and aquatic macro-invertebrates are the Snowtubing Center and parking reconfiguration and East Guest Drop-Off Area.

The proposed run out for the snowtubing area is adjacent to both sides of the Rio Hondo. The stream does have a population of primarily rainbow trout with some evidence of cutbow still in the system. The proposed reconfiguration of parking and transportation could result in some tree removal between the existing parking lots. These areas do serve as filtration zones and can help reduce the runoff of surface sediments. These could affect resident trout and aquatic invertebrates.

The proposed Snowtubing Center and parking lot reconfiguration will require a Storm Water Pollution and Prevention Plan for approval. The mitigation requirements should minimize water quality impacts that could result in a change in trend to either resident trout or macro-invertebrate habitat on the Carson NF.

With mitigations in place to reduce sediment sources from proposed project sites, the effects of the proposed parking lot reconfiguration, and East Guest Drop-Off Area are minor with regard to resident trout and aquatic macro-invertebrate forest wide habitat and population trends; therefore, the proposed projects would not change the forest wide general forest habitat trend or population trend for resident trout and aquatic macro-invertebrates.[187]

Alternative 3

None of the proposed projects under alternative 3 would impact resident trout or aquatic macro-invertebrates.

[186] Ibid.

[187] Ibid.

Migratory Birds

New Mexico Partners in Flight (NMPIF) identifies physiographic areas and high priority migratory bird species by broad habitat types.[188] The Questa RD of the Carson NF is within the Southern Rockies/Colorado Plateau bird conservation region. New Mexico Partners in Flight has also developed a list of highest priority breeding bird species by habitat type. The U.S. Fish and Wildlife Service released its updated "Birds of Conservation Concern Report" in December 2008.[189] This analysis considers birds from both the U.S. Fish and Wildlife Service birds of conservation concern (USFWS list) and Partners in Flight highest priority (NMPIF list).

The habitats described below are found within the TSV permit area. These include alpine tundra, spruce-fir, and high elevation riparian woodland. The species identified by the NMPIF are inclusive of a much larger landscape and have many that do not occur statewide. Only those that are likely to occur and have affected habitat within the TSV permit area and would be representative of the area are included in the discussion.

The habitats analyzed below are found within the TSV permit area. These include alpine tundra, spruce-fir, and high elevation riparian woodland. The species identified by the NMPIF are inclusive of a much larger landscape and have many that do not occur statewide. Only those that are likely to occur and have affected habitat within the TSV permit area and would be representative of the area are included in the analysis. Proposed projects are not expected to produce negative impacts to any of the high priority species or habitat types, but the following tables provide a more detailed analysis of each species.

Alpine Tundra

This habitat occurs on isolated mountain summits above timberline which approximately starts around 12,500 feet. In New Mexico, this community extends from the Colorado border south to areas northeast of Santa Fe. The vegetation includes lichens, mosses, sedges (*Carex* spp., low-growing shrubs, and herbaceous plants.) Elfin (stunted) growth forms of conifers are sometime included. There is an estimated 3,591 acres of alpine tundra in the surrounding areas of the Wheeler Peak Wilderness. Highest priority species are white-tailed ptarmigan and brown-capped rosy-finch.

Alternatives 2 and 3

The following table describes effects to alpine tundra high priority species.

[188] NMPIF, 2003

[189] USFWS, 2008

Table 25. Alpine tundra high priority species

Species	USFWS/ PIF	Important Features and Life History Considerations	Effects
White-tailed Ptarmigan	PIF	See sensitive species write-up	
Brown-capped rosy-finch	USFWS PIF	Uses cirque headwalls, talus slopes and permanent or late-melting snowfields. Nests on cliffs or on the ground, both with an overhanging rock for concealment. Nests often placed near snowfields and situated so that sunlight does not hit the nest. Frequently forages at the edges of snowfields for seeds and torpid insects gleaned from snowbanks.	Species could occur in the vicinity of the proposed Main Street Lift. The desired lift tower placements would likely avoid rocky outcrops that would provide overhanging rock concealment areas. There would likely be no effects to this species
Black rosy-finch	USFWS	Only winters in NM. Caves or cliff (crevices) are important night roost sites. In winter, feeds on alpine tundra during fair weather when ground is blown free of snow. Diet consists almost entirely of seeds. Grazing would have negative impact if it reduced food supply or drew brown-headed cowbirds to alpine habitat.	Snow-free, windblown slopes in alpine tundra are found on the south-facing side of Kachina Ridge. However, the displaced snow on the south slopes accumulates on the north-facing slope. Potential habitat for black rosy-finch is not available where Main Street Lift is proposed. There would be no effects or displacement to this species.

The reclamation work and vegetation growth would likely take at least two years for renewed nesting habitat to develop on the grassland sites that would be disturbed by the proposed activities. Based on the observations of other disturbed sites and the reclamation work within the TSV permit area, there would likely be some foraging opportunities by the end of the first season. Some temporary displacement to black rosy-finch foraging habitat may occur, while the Main Street Lift project is under construction from noise or human presence. Overall impacts to migratory birds dependent upon alpine tundra would be insignificant.

Spruce-Fir (Subalpine)

Highest priority species in the spruce-fir or subalpine habitat type include blue grouse and boreal owl.[190] The boreal owl is discussed in the “Forest Service Sensitive Species” section.

The condition of the majority of the TSV permit area is a series of disturbed openings in the spruce fir habitat type that has been reseeded to stabilize soils and prevent erosion. Because some

[190] NMPIF, 2003

of the area has had quite successful stabilization, it is likely that an occasional ground nesting species, such as the American pipit would also utilize this area for nesting.

Table 26. Spruce-fir high priority species

Species	USFWS/ PIF	Important Features and Life History Considerations	Effects
Boreal owl	PIF	See sensitive species write-up	
Blue grouse	PIF	Nests in virtually all montane forest communities with relatively open tree canopies out of 1.2+ mi (2+ km) from forest edge. Nests almost always on ground with some overhead cover usually under shrubs, rock overhangs, logs or stumps; may nest at base of large trees with no immediate cover in older mature forests. Nest site may change from barren at time of laying to lush and well-concealed at hatch. Generally nests within 164 to 492 feet (50 to 150 m) of free water. Suggestion of a positive correlation between density of birds and age of dominant trees up to about 10 years post-logging and a negative correlation after that. Density of birds decreases as tree canopy increases.	Blue grouse is commonly observed in the TSV permit area. This species has been observed in both the forested type and in the open ski trails. It is not uncommon to see hens with young feeding on the grassy slope habitats. Because there is a fairly high degree of human activity throughout the year, grouse are generally habituated to human presence. Any removal of forested areas converts nesting habitat to foraging habitat. The proposed glading projects would likely increase the quality of nesting habitat for this species.

High Elevation Riparian Woodland

Highest priority species in the high elevation riparian woodland habitat type include the black swift, red-naped sapsucker, Hammond's flycatcher, American dipper, veery, painted redstart, and MacGillivray's warbler.[191] The FWS list also includes bald eagle.[192] The painted redstart does not occur on Carson NF and habitat for the black swift is absent on the forest. In this case there is an extremely limited area of affected habitat that simply does not provide adequate habitat for the majority of species listed above. The American dipper is the only species that likely has suitable habitat available.

[191] NMPIF, 2003

[192] USFWS, 2008

Table 27. High elevation riparian woodland high priority species

Species	USFWS/ PIF	Important Features and Life History Considerations	Effects
American dipper	PIF	Fast-moving, clear, unpolluted, rocky streams with numerous small rapids, riffles and waterfalls. Larger boulders are critical for perches. Numerous pebbles and small stones necessary for harboring aquatic invertebrates that compose the majority of its diet. Aquatic vegetation decreases suitability of stream for foraging.	This species is common to the area along the Rio Hondo, where the snowtubing runout area is proposed. The species would likely be temporarily displaced during construction activity. No habitat should be lost and should be reoccupied once the proposed disturbance is completed.

Cumulative Effects

Appendix B includes a list of past, present, and reasonably foreseeable future projects have been identified by the Forest Service as relevant from a cumulative effects context.

The temporal extent of the analysis commences with conditions existing before the development of TSV in 1955, extend through the history of TSV to the present, and includes the lifespan of current proposed projects as well as those that are current reasonably foreseeable future actions, in general 10 to 20 years into the future from the date of this document.

Taos Ski Valley Past Development

The proposed project areas occur in the spruce-fir forest of New Mexico. There is currently 201,399 acres of this vegetation type on the Carson NF. Approximately 75,000 acres are available for management as a vegetation type. The remainder of these acres is primarily in other management areas, such as wilderness and semi-primitive. In this case, the spruce-fir type is included in management area 16, which is designated in the 1986 Carson Forest Plan for developed recreation, including ski areas. To put the SUP area into context, this spruce-fir forest is within the current southern limit of range of the boreal spruce-fir forest in the Rocky Mountains and retains populations of animals that are also at the southern limit of their known range; most of the animals are somewhat isolated from their greater meta-populations that occur further north.

The cumulative effects to this habitat from the proposed projects and past and present ski resort development, that overlap with the direct and indirect effects of the proposed activities in space and time, are both beneficial and negative to the original flora and fauna of this spruce-fir forest. These changes are directed by the increasing development of a multitude of outdoor oriented recreational opportunities (skiing, snowshoeing, hiking, hunting, birding, camping, fishing, etc.), as well as management such as thinning which increases biodiversity.

A ski area by definition is going to exhibit fragmentation. There is also likely to be some continuation of trail widening in congested areas and for skier safety, improvements for skier comfort, upgrades in lifts to improve visitor flow, and other similar projects in the area. However,

the vast majority of this type of work has been completed for many years now. Small alterations of habitats at this point and in the future, are unlikely to have any consequential effects.

Development within the Village of Taos Ski Valley and Pattison Trust Land

Alterations to the spruce-fir forest on private lands adjacent to the TSV permit area include pioneering of roads into forested areas, permanent canopy removal for home site development, thinning of the forest canopy for fire breaks, limbing of residual trees to open up understory viewsheds, and removal of dead and downed logs to encourage grassland development below the forest canopy and to reduce fire hazard. When considered in conjunction with tree removal included in the proposed projects, this would reduce the spruce-fir forest within the area, however the amount of tree removal would be a negligible impact to the boreal spruce-fir forest in the Rocky Mountains.

In summary, there is also over 16,000 acres of unaltered habitat found surrounding the existing TSV permit boundary in the spruce-fir habitat type of upper Lake Fork Creek, the South Fork of Arroyo Hondo, Long Canyon, and Gavilan Canyon. These areas are protected from habitat alterations by being within the Wheeler Peak Wilderness and within the Columbine-Hondo Wilderness Study Area and act as refugia for continuation of certain species. Only a large scale stochastic event, such as severe extensive drought, extensive pest infestations, or a catastrophic wildfire, could result in the complete forest conversion (loss) of large tracts of spruce-fir and severely impacting the habitat and populations of species in this area.

Irreversible and Irretrievable Commitment of Resources

Tree removal related to the proposed project would represent an irretrievable effect, when considered for the life of the 40-year SUP, to wildlife habitat for species that use such habitats within the SUP area. However, this is not considered an irreversible commitment because overstory vegetation is a renewable resource.

Specially Designated Areas

There are no specially designated trails, such as National Recreation Trails, or roads in the TSV permit area. None of the alternatives would have direct, indirect, or cumulative effects to trails or roads with special designations.

Wilderness Areas, Wilderness Study Areas, and Inventoried Roadless Areas

The Wheeler Peak Wilderness Area (19,150 acres), Columbine-Hondo Wilderness Study Area (WSA) (31,200 acres), and Columbine-Hondo Inventoried Roadless Area (12,076 acres) are adjacent to or in close proximity with the TSV permit area. All of these specially designated areas are currently managed to preserve their natural landscape characteristics and for primitive or semi-primitive, non-motorized recreation opportunities.

The proposed projects are located across the valley from both the boundary of the Wheeler Peak Wilderness (approximately 1.25 miles to the east) and the Columbine-Hondo Wilderness Study Area (approximately ¾ of a mile to the north). The presence of Wheeler Peak Wilderness limits potential expansion of the ski area.

The Wilderness Act of 1964 provides Congress the power to designate areas of federally managed land as protected wilderness. Wilderness areas are places where human influence is “substantially unnoticeable,” and once designated they are managed to retain this wild character as well as to provide opportunities for solitude and recreation. Human activities are limited to non-motorized, non-developed recreation, scientific research, and other non-invasive activities. In general, the law prohibits logging, mining, mechanized vehicles (including bicycles), road-building, and other forms of development in wilderness areas. While none of the proposed actions would increase or encourage these prohibited activities in the wilderness area, WSA or roadless area, the top terminal of the proposed Main Street Lift would be visible from the ridge between Wheeler and Walter peaks in the Wheeler Peak Wilderness and may detract from the undeveloped wild character the view currently exhibits. Currently there are no regulations that preclude development on lands visible from wilderness. Natural topography, combined with the north-facing aspect of Kachina Peak within TSV’s SUP area, would obscure most of (portions of the top terminal infrastructure may be slightly visible) the Main Street Lift from Wheeler Peak Wilderness. Limiting the size of any improvements would keep any changes subordinate to the generally wild landscape character. Other than this minimal visual impact to the Wheeler Peak Wilderness, no other wilderness resources, such as noise or solitude, or specially designated areas are likely to be affected by any of the proposed actions.

Wild and Scenic River Eligibility

The National Wild and Scenic Rivers Act (P.L. 90-542; U.S.C. §1271) was established by Congress in 1968 to preserve free-flowing rivers that possess certain “outstandingly remarkable” values. Pursuant to Section 5(d)(1) of the act, the Secretary of Agriculture requires the Forest Service to evaluate rivers within its jurisdiction for their potential for inclusion in the National Wild and Scenic Rivers System. Evaluation of a river’s potential as a wild and scenic river consists of the following three-step process:

1. Determination of eligibility (inventory);
2. Potential classification – wild, scenic, or recreational (inventory); and
3. Determination of suitability (decision).

In 1998 the Carson National Forest evaluated rivers on the Questa Ranger District pursuant to the act. An eligibility and classification inventory was completed by an interdisciplinary team, including experts in wildlife, recreation, hydrology, and fisheries.[193] Lake Fork Creek, a tributary of the Rio Hondo, lies along the east and north side of the TSV permit area and Rio Hondo lies on the north side. Neither Lake Fork Creek nor the Rio Hondo were determined to be eligible for potential inclusion in the National System under the Wild and Scenic Rivers Act (Pub. L. 90-542 16 U.S.C. 1271-1287). None of the alternatives would have an effect on the wild and scenic rivers or a river's eligibility. Since there no direct or indirect effects to eligible wild and scenic rivers, there are no cumulative effects from any of the alternatives.

[193] USDA Forest Service, 1998

Chapter 4. Consultation and Coordination

Preparers

Forest Service Team

The following people participated in initial scoping, were members of the Interdisciplinary Team, and/or provided direction and assistance during the preparation of this EIS.

Kendall Clark	Carson National Forest Supervisor, Responsible Official
Jerry Mastel	Carson National Forest, Questa District Ranger
Audrey Kuykendall	ID Team Leader, Forest NEPA and Appeals Coordinator
Mary Ann Elder	East Zone Recreation and Lands Staff
Greg Miller	Forest Soil Scientist (and Hydologist)
George Long	Wildlife Biologist (and Botanist), Questa RD
Jack Carpenter	Natural Resources Planner (Economist)
Tim Fruits	Forestry/Silviculture
Carrie Leven	Archaeologist
Troy Waskey	Recreation and Lands Program Manager

Consultant Team

The use of a third party consulting firm for preparation of an EIS is addressed in the Code of Federal Regulations at 40 CFR Title 40, Part 1506.5(c). If an EIS is prepared with the assistance of a consulting firm, the firm must execute a disclosure statement, as indicated below:

> *Except as provided in §§1506.2 and 1506.3 any environmental impact statement prepared pursuant to the requirements of NEPA shall be prepared directly by or by a contractor selected by the lead agency or where appropriate under §1501.6(b), a cooperating agency. It is the intent of these regulations that the contractor be chosen solely by the lead agency, or by the lead agency in cooperation with cooperating agencies, or where appropriate by a cooperating agency to avoid any conflict of interest. Contractors shall execute a disclosure statement prepared by the lead agency, or where appropriate the cooperating agency, specifying that they have no financial or other interest in the outcome of the project. If the document is prepared by contract, the responsible Federal official shall furnish guidance and participate in the preparation and shall independently evaluate the statement prior to its approval and take responsibility for its scope and contents. Nothing in this section is intended to prohibit any agency from requesting any person to submit information to it or to prohibit any person from submitting information to any agency.*

Accordingly, a disclosure statement was signed by the third party consulting team.

SE Group

Kent Sharp	Principal-in-Charge
Jason Marks	Senior Project Manager
Kelly Owens	Assistant Project Manager/Biologist/GIS Analyst
Chris Ward	Silviculturalist/Environmental Analyst
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Subcontractor

Ben Kuykendall	Wildlife Biologist

Agencies, Organizations, Tribal Governments, and Persons Contacted

Federal Government

Advisory Council on Historic Preservation

Bureau of Land Management - Taos Field Office

Department of Energy

Federal Aviation Administration

Federal Highway Administration

National Agricultural Library, USDA

National Oceanic and Atmospheric Administration, DOC

Office of Environmental Policy and Compliance, DOI

US Animal and Plant Health Inspection Service, USDA

US Army Corps of Engineers

US Coast Guard

US Environmental Protection Agency

US Fish and Wildlife Service, DOI

US Forest Service, Espanola Ranger District

US House of Representatives

US Natural Resources Conservation Service, USDA

US Navy

US Senate

Tribal Government

Bureau of Indian Affairs – Northern Pueblos Agency

Comanche Tribe of Oklahoma

Eight Northern Pueblos Council

Jicarilla Apache Nation

Pueblo of Jemez

Pueblo of Kewa

Pueblo of Nambe

Pueblo of Ohkay Owingeh

Pueblo of Picuris

Pueblo of Pojoaque

Pueblo of Santa Clara

Pueblo of Taos

Pueblo of Tesuque

Pueblo of Zuni

The Hopi Tribe

The Navajo Nation

Southern Ute Indian Tribe

Ute Mountain Tribe

White Mountain Apache Tribe

State Government

New Mexico Department of Game & Fish

New Mexico Economic Development & Tourism Department

New Mexico Environment Department

New Mexico State Senate

New Mexico Energy, Minerals and Natural Resources Department

State Historic Preservation Office (SHPO)

Local Government

Taos County

Town of Red River

Town of Taos

Village of Taos Ski Valley

Literature Cited

40 CFR 59, 80, 85 and 86. 2006. Control of Hazardous Air Pollutants from Mobile Sources. March 29.

42 USC 7470-7479. Public Health and Welfare.

59 Federal Register 7629. 1994.

Bennett, L. A. and F. B. Samson. 1984. Marten ecology and habitat management in the Central Rocky Mountains, Study Plan. USDA Forest Service, Fort Collins. Contract Dept. Fishery & Wildlife Biology, CO State University, Fort Collins, Colo. 51pp.

BISON-M. 2008a. Biota Information System of New Mexico. Ermine information (01/23/2008). BISON-M home page. http://www.bison-m.org. [Accessed 10/08/2008]

———. 2008b. Biota Information System of New Mexico. Long-tailed vole information (10/21/2008). BISON-M home page. http://www.bison-m.org. [Accessed 12/05/2008]

———. 2008c. Biota Information System of New Mexico. Western heather vole information (01/23/2008). BISON-M home page. http://www.bison-m.org. [Accessed 12/05/2008]

Braun, C. E. 1979. White-tailed ptarmigan and sage grouse investigations, New Mexico. Memorandum to Jack R. Grieb, Director, Colorado Division of Wildlife. August 15, 1979.Bull, E. L.; Blumton A. K. 1999. Effect of fuels reduction on American martens and their prey. Research Note PNW-RN-539. Pacific Northwest Research Sta., United States Department of Agriculture Forest Service Southwestern Region 9 pp.

Briner, G. 2011. Personal Communication with TSV General Manager. December 16.

Bull, E.L. and T. W. Heater. 2001. Survival, causes of mortality, and reproduction in the American marten in Northeastern Oregon. Northwestern Naturalist 82:1-6.

Bull, E.L., T. W. Heater, A.A. Clark, J.F. Shepherd and A.K. Blumton. 2005. Influence of precommercial thinning on snowshoe hares. PNW-RP-562. Portland, OR. U. S. Dept. of Agric., Forest Service, Pacific Northwest Research Sta. 16 pp.

Buskirk, S. W. 2002. Conservation assessment for the American marten in Black Hills National Forest, South Dakota and Wyoming. Rocky Mountain Research Station, Missoula, MT. Personal Serv. Contract, Dept. Zoology and Physiology, University of Wyoming, Laramie. Unpubl. Rpt. 51 pp.

Buskirk, S. W and L.F. Ruggiero. 1994. American Marten. In: The scientific basis for conserving forest carnivores: American marten, fisher, lynx and wolverine in the Western United States. L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, L. J. Lyon and W. J. Zielinski Technical Eds. USDA Forest Service Gen. Tech. Rpt. RM-254. w/Appendices 184 pp.

City Data. 2009. Taos Ski Valley. http://www.city-data.com/city/Taos-Ski-Valley-New-Mexico.html.

Connelly, C.A. 2011. Director of Public Affairs & Tourism, Town of Taos. Letter to Taos Ski Valley.

Cowardin, et al. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31, U.S. Fish and Wildlife Service, Office of Biological Services, Washington, DC.

Ellsworth, E. and T.D. Reynolds. 2006. Snowshoe hare (*Lepus americanus*): a technical conservation assessment. USDA Forest Service, Rocky Mountain. Region. w/Appendix. Available: http://www.fs.fed.us/r2/projects/scp/assessments/snowshoehare.pdf. 67 pp.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

———. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation manual: Western Mountains, Valleys, and Coast Region (Version 2.0).

Environmental Law Resource. 2010. Dodging the Bullet: Advice to Facilities Whose Emissions May Be Under the Reporting Threshold of USEPA's Proposed Mandatory GHG Inventory Report Regulations. http://www.environmentallawresource.com. Posted on March 31, 2009, accessed on July 21, 2010.

Finch, D. M. 1992. Threatened, endangered, and vulnerable species of terrestrial vertebrates in the Rocky Mountain Region. Gen. Tech. Rep. RM-215. Fort Collins, CO: USDA, Forest Service. Rocky Mountain. Forest and Range Exp. Sta. 38pp.

Findley, J.S., A.H. Harris, D.E. Wilson, and C. Jones. 1975. Mammals of New Mexico. University of New Mexico Press, Albuquerque, New Mexico. xxii + 360 pp.

Frey, J. K. 2003. Baseline inventory of small mammal prey-base communities on Carson National Forest, New Mexico (Final). USDA Forest Service Contract R3-02-03-12, Carson National Forest, Taos, NM. Unpublished report. 48 pp. + appendices.

———. 2011. Personal communication with project biologist Ben Kuykendall on 1/11/11.

Hadley, G. L. and K.R. Wilson. 2004a. Patterns of density and survival in small mammals in ski runs and adjacent forest patches. J. of Wildlife Management 68:288-298.

———. 2004b. Patterns of small mammal density and survival following ski-run development. J. of Mammology 85:97-104.

Hakkarainen, H. and E. Korpimaki. 1996. Competitive and predatory interactions among raptors: an observational and experimental study. Ecological Soc. of America 77: 1134-1142.

Hargis, C. D. and J.A. Bissonette. 1995. The effect of forest fragmentation on American marten populations and prey availability. Final Rpt. Contract #91-9166. Utah Div. of Wildlife Resources, Wasatche-Cache Natl. Forest, Ashley Natl. Forest, Utah Wilderness Assoc. Utah Coop. Fish and Wildlife Research Unit, Utah St. Univ. Logan, Utah. 26 pp.

Hayward, G. D. 1994. Review of technical knowledge: Boreal owls In: Flammulated, Boreal, and Great Gray owls in the United States: A Technical Conservation Assessment. Gen. Tech Rpt. RM-253. Fort Collins, Colo. US Dept. Agric., Forest Serv., Rocky Mountain. Forest and Range Exp. Sta. pg 92-127.

Hein, E. 2011. Personal communication with project biologist, Ben Kuykendall. September 30.

Hoover, R. L. and D.L. Wills, ed. 1987. Managing forested lands for wildlife. Colo. Div. of Wildlife. In: Cooperation with USDA Forest Service, Rocky Mountain Region, Denver, CO. 459 pp.

LaMarche, J.L. and D.P. Lettenmaier. 2001. Effects of forest roads on flood flows in the Deschutes River, Washington. Earth Surface Processes and Landforms.

Long, B. 2001. The distribution of American marten in Northern New Mexico (June 1997–June 2001). New Mexico Dept. of Game and Fish, Santa Fe, NM. Unpublished rpt. 23 pp.

Malaney, J. L. and J.K. Frey. 2006. Summer habitat use by snowshoe hare and mountain cottontail at their southern zone of sympatry. J. Wildlife Management 70: 877-883.

McAllister, J.A. and R.S. Hoffmann. 1988. Mammalian species, No. 305, Phenacomys intermedius. Published by: American Society of Mammalogists. January 15, 1988. pp. 1-8.

National Resources Conservation Service (NRCS). 2008. Soil K Factor. Accessed November 1, 2011. http://www.pr.nrcs.usda.gov/technical/soil_survey/HELdefs.htm

NatureServe. 2008. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.2. NatureServe, Arlington, Virginia http://www.natureserve.org/explorer [Accessed: 04/02/08].

New Mexico Department of Game and Fish (NMDGF). 1993. Rocky Mountain bighorn sheep transplant from the Pecos Wilderness to the Wheeler Peak Wilderness Area. Environmental assessment and decision notice. Santa Fe, NM: Department of Game and Fish and US Department of Agriculture, Forest Service. 41 pp.

———. 2006. Comprehensive Wildlife Conservation Strategy for New Mexico w/Appendices. Available at: http://www.wildlife.state.nm.us/conservation/comp_wildlife_cons_strategy/cwcs.htm. 526 pp.

———. 2008a. Biota Information System of New Mexico (Bison-M) database. www.bison-m.org/booklet.aspx?id=050710 for Masked Shrew. [Accessed 03/07/2008 & 04/22/2008] 14 pp.

———. 2008b. Biota Information System of New Mexico (Bison-M) database. www.bison-m.org/booklet.aspx?id=050105 for Snowshoe hare. [Accessed 05/20/2008] 37 pp.

New Mexico Environment Department. 2001. Air Quality Bureau – Air Monitoring Trailor. http://air.state.nm.us/stationStatus.php?stationNo=26. Last accessed November 4, 2011

New Mexico Environment Department Surface Water Quality Bureau. 2005. Final Approved Total Maximum Daily Load (TMDL) for the Rio Hondo (South Fork of Rio Hondo to Lake Fork Creek). June 14, 2005.

———. 2010a. US EPA – Approved 2010–2012 State of New Mexico Clean Water Action Sections 303(e) and (305(b) Appendix A. List of Assessed Surface Waters.

———. 2010b. Record of Decision – 2010–2012 State of New Mexico Clean Water Action Sections 303(e) and (305(b) Appendix A. List of Assessed Surface Waters. 128 pp.

New Mexico Partners in Flight (NMPIF). 2003. New Mexico bird conservation plan. Version 1.0. Albuquerque, NM. April 2003. http://www.hawksaloft.org/pif.html.

National Ski Areas Association (NSAA). 2011. Kottke National End of Season Survey 2010/11 Final Report.

Payer, D.C. and J.D. Harrison. 2000. Territoriality and home-range fidelity of marten in relation to timber harvesting and trapping. Abstract. Martes Working Group Newsletter 8(1):6.

Pub. L. 110–140 Energy Independence and Security Act of 2007.

Reynolds, R.T., R.T. Graham, M. Hildegard Reiser, and others. 1992. Management recommendations for the northern goshawk in the southwestern United States. General Technical Report RM-217. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 90 pp.

Russell, J.C and P.A. Adams-Russell. 2006. Attitudes, Values and Beliefs Toward National Forest System Lands: The Carson National Forest USDA Forest Service.

Schumacher, T. V., R.W. Flynn, and S.W. Buskirk. 2000. A multi-scale analysis of habitat selection at dens and resting sites of American martens in Southeast Alaska. Abstract. Martes Working Group Newsletter. 8(1): 9.

Shanley, J.B. and B.Wemple. 2002. Water quality and quantity in the mountain environment. Vermont Law Review, vol. 26:717, 717-751.

Ski New Mexico. 2011. Visitation data provided by Taos Ski Valley from a variety of sources.

State of New Mexico. 2011. State Engineer Office file # 01701A.

Tague, C. and L. Band. 2001. Simulating the impact of road construction and forest harvesting on hydrologic response. Earth Surface Processes and Landforms, 26:135-151.

Taos County. 2003. Comprehensive Plan Update. http://www.taoscounty.org/DocumentView.aspx?DID=30

Taos County Chamber of Commerce. 2011. Taos Economic Report 1st Quarter 2011. http://www.taosgov.com/finance/grt.php

Taos Pueblo. 2011. New Mexico Native American Indians. www.taospueblo.com

Taos Ski Valley. 1981. Taos Master Development Plan.

———. 2010. Taos Master Development Plan.

Thompson, I. 1994. Marten populations in uncut and logged boreal forests in Ontario. J. Wildlife Management 58:272-280.

———. 1997. Ontario develops marten habitat management guidelines. In: Martes Working Group Newsletter 5: 4-5.

Thompson, I. and P.W. Colgan. 1994. Marten activity in uncut and logged boreal forests in Ontario. J. Wildlife Management 58: 280-288.

Troendle, C.A. and Leaf, C.F. 1980. Hydrology, An Approach to Water Resources Evaluation of Non-point Silvicultural Sources (WRENSS). EPA60018-80-012, Environmental Research Laboratory, Athens, GA.

University of New Mexico Bureau of Business and Economic Research. 2003. Bureau of Business and Economic Research Growth Projection.

USDA Forest Service. 1981. EIS for the Proposed TSV inc. Master Development Plan. Southwestern Region. Albuquerque, NM.

———. 2007. Socioeconomic Assessment of the Carson National Forest, USFS, p. 79. July 2007.

———. 1986a. Environmental Impact Statement, Carson National Forest Land and Resource Management Plan. USDA Forest Service, Southwestern Region. Albuquerque, NM.

———. 1986b. Record of Decision for the Environmental Impact Statement, Carson National Forest Land and Resource Management Plan. USDA Forest Service, Southwestern Region. Albuquerque, NM.

———. 1986c. Carson National Forest Land and Resource Management Plan (forest plan) as amended. USDA Forest Service, Carson National Forest. Taos, NM.

———. 1986d. Carson National Forest Plan, Amend 7. October 1990. pg. 16. Recreation Sites-1.

———. 1987. Terrestrial Ecosystems Survey of the Carson National Forest. USDA Forest Service, Carson National Forest. Taos, NM. Originally Published 1987. Last revised 1993.

———. 2007. Regional forester's sensitive species list for the Southwestern Region. USDA Forest Service, Southwestern Region. Albuquerque, NM.

———. 2008. Environmental Assessment for North America Ski Trails at Taos Ski Valley. USDA Forest Service, Carson National Forest - Questa Ranger District.

———. 2011. Management indicator species assessment. USDA Forest Service, Carson National Forest. Taos, NM.

U.S. Census Bureau. 2010a. 2010 Census. http://2010.census.gov/2010census/

———. 2010b. 2006–2010 American Community Survey. http://factfinder2.census.gov

U.S. Energy Information Administration. 2009. International Energy Statistics Global CO2 emissions from fossil fuel combustion. http://tonto.eia.doe.gov/cfapps/ipdbproject/IEDIndex3.cfm> EIA (2009).

U.S. Environmental Protection Agency. 2009. Air and Radiation: National Ambient Air Quality Standards (NAAQS). http://www.epa.gov/air/criteria.html. Accessed May 28, 2010.

———. 2010. Inventory of US Greenhouse Gas Emissions and Sinks: 1990–2008.

———. 2011. Climate Change Glossary. http://www.epa.gov/climatechange/glossary.html, Last accessed December 20, 2011.

U.S. Federal Highway Administration (FHWA). 2007. Highway Statistics 2007. Office of Highway Policy Information, Federal Highway Administration. Table VM-1

U.S. Fish and Wildlife Service (USFWS). 2008. Birds of conservation concern. USDI Fish and Wildlife Service. Division of Migratory Bird Management. Arlington, VA. http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/BCC2008.pdf

———. 2009. 12-month finding on a petition to expand the listing of the Canada lynx (Lynx canadensis) to include the State of New Mexico, under the Endangered Species Act of 1973, as amended. Federal Register. Volume 74, Number 241. USDI Fish and Wildlife Service. Washington, DC. December 17, 2009.

U.S. Presidential Document. 1999. Memorandum from the President to the Heads of Departments and Agencies. Comprehensive Presidential Documents No. 279 (February 11, 1994)

Van Dyke, W.A., A. Sands, J. Yoakum, and others. 1983. Wildlife habitats in managed rangelands--the Great Basin of southeastern Oregon: bighorn sheep. General Technical Report. PNW-159. Portland, OR: US Department of Agriculture, Forest Service, Pacific Northwest and Range Experiment Station. 37 pp.

Village of Taos Ski Valley. 1997. Ordinance No. 10-30 An Ordinance Adopting Zoning Regulations And A Zoning Map For The Village Of Taos Ski Valley, New Mexico. http://www.vtsv.org/Ordinances/ORD%2010-30%20zoning%20ordinance.pdf

———. 2010. Village of Taos Ski Valley Master Plan. http://www.vtsv.org/PandZ/Village%20Master%20Plan%20November%202010.htm

Walters, B.B. 1991. Small mammals in a subalpine old-growth forest and clearcuts. Northwest Science 65:27-31.

Glossary

Acre foot: The amount of water necessary to cover 1 acre to a depth of 1 foot; equals 43,560 cubic feet or 325,851 gallons.

Action Alternatives: Any alternative that includes upgrading and/or expansion of existing winter and summer recreational development within the area.

Active pedestrian environment: An active pedestrian environment refers to the existence of a myriad of retail shops and dining and pleasant urban design that engages pedestrians and makes the environment exciting or pleasurable to walk through.

Affected environment: The physical, biological, social, and economic environment that would or may be changed by actions proposed and the relationship of people to that environment.

Airshed: A geographical area that, because of topography, meteorology, and climate, shares the same air. The Clean Air Act establishes three air quality classes (I, II, and III), each with defined air quality standards.

> **Class I airsheds** are areas designated for the most stringent degree for protection from future degradation of air quality.
>
> **Class II airsheds** are areas where a moderate amount of development could occur.
>
> **Class III airsheds** are areas where significant development could occur as long as National Ambient Air Quality Standards are not exceeded.

Alternative: One of several conceptual development plans described and evaluated in the EIS.

Army Corps of Engineers (USACE): The federal agency charged with enforcing the Clean Water Act by regulation of dredge and fill activities in waters of the United States, including wetlands.

Background view: A landscape viewing area visible to a viewer from approximately 3 to 5 miles to infinity. Also, in economics, naturally occurring; uninduced.

Baseline condition: The existing dynamic conditions prior to development, against which potential effects are judged.

Best Management Practices (BMPs): Forest management actions and mitigation prescriptions, which are designed to maintain resource values through preventative rather than corrective measures.

Canopy: The more-or-less continuous cover of leaves, needles and/or branches collectively formed by the crowns of adjacent trees in a stand or forest.

Clean Water Act: An act that was enacted by the U.S. Congress in 1977 to maintain and restore the chemical, physical, and biological integrity of the waters of the United States. This act was formerly known as the Federal Water Pollution Control Act (33 U.S.C. 1344).

Comfortable carrying capacity (CCC): Comfortable Carrying Capacity (CCC) is a planning tool used to determine the optimum level of utilization that facilitates a pleasant recreational experience. This is a planning figure only and does not represent a regulatory cap on visitation. CCC is used to ensure that different aspects of a resort's facilities are designed to work in

harmony, that capacities are equivalent across facilities, and sufficient to meet anticipated demand. CCC is based on factors such as vertical transport and trail capacities.

Corridor: A linear strip of land identified for the present or future location of transportation or utility rights-of-way within its boundaries. Also, a contiguous strip of habitat suitable to facilitate animal dispersal or migration.

Council on Environmental Quality (CEQ): An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

Cover: Vegetation used by wildlife for protection from predators and weather conditions, or in which to reproduce.

Cover Density: Forest cover density is an index which theoretically ranges from zero to less than one. It references the capability of the stand or cover to integrate and utilize the energy input to transpire water. Cover density represents the efficiency of the three-dimensional canopy system to respond to the energy input. It varies according to crown closure, vertical foliage distribution, species, season, and stocking.

Cubic feet per second (cfs): Unit measure of streamflow or discharge, equivalent to 449 gallons per minute or about 2 acre feet per day.

Cumulative impact: The impact on the environment which results from the incremental impact of the action when added to other past, present and reasonable foreseeable future actions regardless of what agency or person undertakes such other actions. Each increment from each project may not be noticeable but cumulative impacts may be noticeable when all increments are considered together.

Direct impact: An effect which occurs as a result of an action associated with implementing the proposal or one of the alternatives, including construction, operation, and maintenance.

Distance zone: One of three categories used in the visual management system to divide a view into near and far components. The three categories are (1) foreground, (2) middleground, and (3) background. See individual entries.

Endangered species: An official designation for any species of plant or animal that is in danger of extinction throughout all or a significant portion of its range. An endangered species must be designated in the Federal Register by the appropriate Federal Agency Secretary.

Environmental Assessment (EA): A concise public document required by the regulations implementing the National Environmental Policy Act which briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.

Environmental Consequences: An environmental effect, impact, or consequence is defined as a modification of or change in the existing environment brought about by the action taken. Effects can vary in degree, ranging from only a slightly discernible change to a drastic alteration in the environment. Effects are direct, indirect, or cumulative and may be temporary (short-term) or permanent (long-term).

Environmental Impact Statement (EIS): A disclosure document required by the National Environmental Policy Act (NEPA) that documents the anticipated environmental effects of a proposed action that may significantly affect the quality of the human environment.

Environmental Protection Agency (EPA): The federal agency charged with lead enforcement of multiple environmental laws, including review of Environmental Impact Statements.

Erosion: The detachment and movement of soil from the land surface by wind, water, ice, or gravity.

Erosion control: Materials, structure, and techniques designed to reduce erosion. Erosion control may include rapid revegetation, avoiding steep or highly erosive sites, and installation of cross-slope drainage structures.

Finding of No Significant Impact (FONSI): A document that is prepared if the agency finds, in an environmental assessment, that the proposed action will not significantly affect the human environment. It must set forth the reasons for such a decision.

Forage: All browse and non-woody plants used for grazing or harvested for feeding livestock or game animals.

Forb: Any non-grass-like plant having little or no woody material on it. A palatable, broadleaved, flowering herb whose stem, above ground, does not become woody and persistent.

Foreground view: The landscape area visible to an observer from the immediate area to 0.5 mile.

Forest Plan: A comprehensive management plan prepared under the National Forest Management Act of 1976 that provides standards and guidelines for management activities specific to each National Forest. The SJNF Forest Plan was approved in 1992.

Forest Service: The agency of the United States Department of Agriculture responsible for managing National Forests and Grasslands.

Forest Supervisor: The official responsible for administering the National Forest System lands in a Forest Service administrative unit who reports to the Regional Forester.

GIS: Geographic information system, a computer mapping system composed of hardware and software.

Glade: Glades are forested areas throughout a ski area, either natural or purposefully thinned, that provide varying levels of challenge, depending on the tree density and slope angle.

GPS: Global Positioning System, a satellite-based surveying system.

Gross receipts taxes (GRT): Gross receipts taxes (GRT) are used in New Mexico in lieu of a state sales tax. Rather than a tax exacted on each transaction, New Mexico businesses pay a tax on total monies received.

Guideline: An indication or outline of policy or conduct that is not a mandatory requirement (as opposed to a standard, which is mandatory).

Habitat type: A classification of the vegetation resource based on dominant growth forms. The forested areas are more specifically classified by the dominant tree species.

Hydric soils: Soils characterized by, or requiring an abundance of moisture, used in the identification of wetlands.

Indirect impact: Secondary consequences to the environment resulting from a direct impact. An example of an indirect impact is the deposition of sediment in a wetland resulting from surface disturbance in the upland.

Instream flow: The volume of surface water in a stream system passing a given point at a given time.

Interdisciplinary Team (ID Team): A group of individuals each representing specialty resource areas assembled to solve a problem or perform a task through frequent interaction so that different disciplines can combine to provide new solutions.

Labor income impacts: Labor income impacts refers to the effect of income from the workforce, when spent in the community.

Management Area (MA): Management areas (MA) are created to manage portions of the forest, based on ecological conditions, historic development, and anticipated future conditions.

Management direction: A statement of multiple-use and other goals and objectives, the associated management prescriptions, and standards and guidelines for attaining them.

Management indicator species (MIS): A representative group of species that are dependant of a specific habitat type. The health of an indicator species is used to gauge function of the habitat on which it depends.

Management practice: A specific activity, measure, course of action, or treatment.

Master Development Plan (MDP): A document that is required as a condition of the ski area term special use permit, designed to guide resort planning and development and avoid piecemeal decision making.

Middleground view: The landscape area visible to a viewer from 0.5 mile to about 3 to 5 miles.

Mitigation: Actions taken to avoid, minimize, reduce, eliminate, or rectify the adverse environmental impacts associated with the implementation of an alternative or a portion thereof.

National Ambient Air Quality Standards (NAAQS): Established under the Clean Air Act of 1963, there are primary standards, designed to protect public health, and secondary standards, designed to protect public welfare from known or anticipated air pollutants.

National Environmental Policy Act (NEPA): A law enacted by Congress in 1969 that requires federal agencies to analyze the environmental effects of all major federal activities that may have a significant impact on the quality of the human environment.

National Forest Management Act (NFMA): A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of regulations to guide that development.

National Forest System (NFS) lands: National Forests, National Grasslands, and other related lands for which the Forest Service is assigned administrative responsibility.

National Historic Preservation Act (NHPA): An act that was enacted by the U.S. Congress in 1966 to protect historic sites and artifacts (16 U.S.C. 470). Section 106 of the Act requires consultation with members and representatives of Indian tribes.

National Register of Historic Places: A listing maintained by the National Park Service of areas which have been designated as historically significant. The register includes places of local and state significance, as well as those of value to the nation in general.

New Mexico Department of Game and Fish (NMDGF): The State of New Mexico Department responsible for overseeing wildlife regulation within New Mexico.

New Mexico Environment Department (NMED): The State of New Mexico Department responsible for overseeing environmental regulation within New Mexico.

No action alternative: The management direction, activities, outputs, and effects that are likely to exist in the future if the current trends and management would continue unchanged. Under NEPA, it means following the current approved Forest Plan management direction and guidance.

Palustrine emergent wetlands (PEM): This wetland class is characterized by the presence of erect, rooted, usually perennial, herbaceous hydrophytic plants.

Palustrine shrub/scrub wetlands (PSS): This type of wetlands is defined as being dominated by a woody vegetation community composed of shrubs and young trees less than 6 feet tall

Particulates: Small particles suspended in the air and generally considered pollutants.

Pod: The area comprising a lift and associated trails.

Preferred Alternative: The alternative selected from the range of alternatives which is favored by the lead agency.

Project area: The area encompassed by the development proposal including base area and the permit area.

Project Design Criteria: Specific measures designed to minimize or avoid impacts anticipated to occur as a result of implementation of the action alternatives. PDC are required components of specified action alternatives.

Proponent: The individual or business who is proposing the development. In this case, the proponent is Taos Ski Valley.

Record of Decision (ROD): A document prepared within 30 days after the final EIS is issued which states the agency's decision and why one alternative was favored over another, what

factors entered into the agency's decision, and whether all practicable means to avoid or minimize environmental harm have been adopted, and if not, why not.

Revegetation: The re-establishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance such as seedbed preparation, reseeding, and mulching.

Riparian habitat: Land situated along the bank of a stream or other body of water and directly influenced by the presence of water (e.g., streamsides, lake shores, etc).

Scenery Management System: The USDA Forest Service methodology for classifying the aesthetic values of landscapes are based upon the scenic attractiveness of the landscape, the landscape's visibility and the public's concern about changes in the landscape from a natural condition.

Scoping process: A process that determines the issues, concerns, and opportunities which should be considered in analyzing the impacts of a proposal by receiving input from the public and affected agencies. The depths of analysis for these issues identified are determined during scoping.

Sediment: Solid material, both organic and mineral, that has been transported from its site of origin by air, water, or ice.

Sense of arrival: The special feeling a guest experiences during the first ten seconds or so after entering a hotel or other location.

Sensitive species: Species which have appeared in the Federal Register as proposed additions to the endangered or threatened species list; those which are on an official State list or are recognized by the Regional Forester to need special management in order to prevent them from becoming endangered or threatened.

Special Use Permit (SUP): A legal document, similar to a lease, issued by the U.S. Forest Service. These permits are issued to private individuals or corporations to conduct commercial operations on National Forest System lands. They specify the terms and conditions under which the permitted activity may be conducted.

Special-use permit area: That area of National Forest lands encompassed within the permit boundary held by Taos Ski Valley and designated for recreational use (e.g., downhill skiing and Nordic skiing). Excludes private land.

Stand: A community of trees or other vegetation, which is sufficiently uniform in composition, constitution, age, spatial arrangement, or condition to be distinguishable from adjacent communities and to thus, form a management entity.

Standard: A standard is a course of action which must be followed; adherence is mandatory.

Study area: The geographical area that was analyzed to predict the possible effect that may be associated with proposed alternatives. This area varies depending on the resource, but often coincides with the special use permit boundary.

Threatened species: Any species which is likely to become an endangered species within the foreseeable future and which has been designated in the Federal Register as a threatened species.

Total Maximum Daily Load (TMDL): A calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources.

Understory: Low-growing vegetation (herbaceous, brush or reproduction) growing under a stand of trees. Also, that portion of trees in a forest stand below the overstory.

U.S. Fish and Wildlife Service (USFWS): The agency of the Department of the Interior responsible for managing wildlife, including non-ocean going species protected by the Endangered Species Act.

Visual Management System (VMS): The Visual Management System (VMS) was adopted in 1974 as the primary scenery management direction by the Forest Service to inventory and mange the visual resources of NFS lands. The visual management inventory consists of three steps: landscape character type, variety class, and sensitivity levels overlaid on distance from the viewer. These steps are combined and interpreted to develop Visual Quality Objectives (VQO).

Visual quality: Describes the degree of variety in the landscape, created by the basic vegetative patterns, landform, and water forms. Landscapes with the greatest variety or diversity have the greatest potential for high scenic value or visual quality.

Visual quality objectives (VQO): Visual quality objectives (VQO) assess the existing scenic character of an area in terms of pattern elements (form, line, color and texture) and pattern character (dominance, scale diversity and continuity) to identify the extent to which the scenic character would exhibit contrast with the landscape, or its converse—compatibility. The acceptable limits of change of a particular area are the documented VQO, which serve as management goals for scenic resources.

Water Rights: The legal right to use water.

Watershed: The entire area that contributes water to a drainage system or stream.

Wilderness: Under the 1964 Wilderness Act, wilderness is undeveloped federal land retaining its primeval character and influence without permanent improvements of human habitation. It is protected and managed so to preserve its natural conditions.

Wilderness Study Area (WSA): Wilderness Study Areas contain undeveloped United States federal land retaining its primeval character and influence, without permanent improvements or human habitation, and are managed to preserve their natural conditions and potential for wilderness designation.

Winter Range: That part of the home range of a species where 90 percent of the individuals are located during the winter at least five out of ten winters.

Appendix A. Alternatives Maps

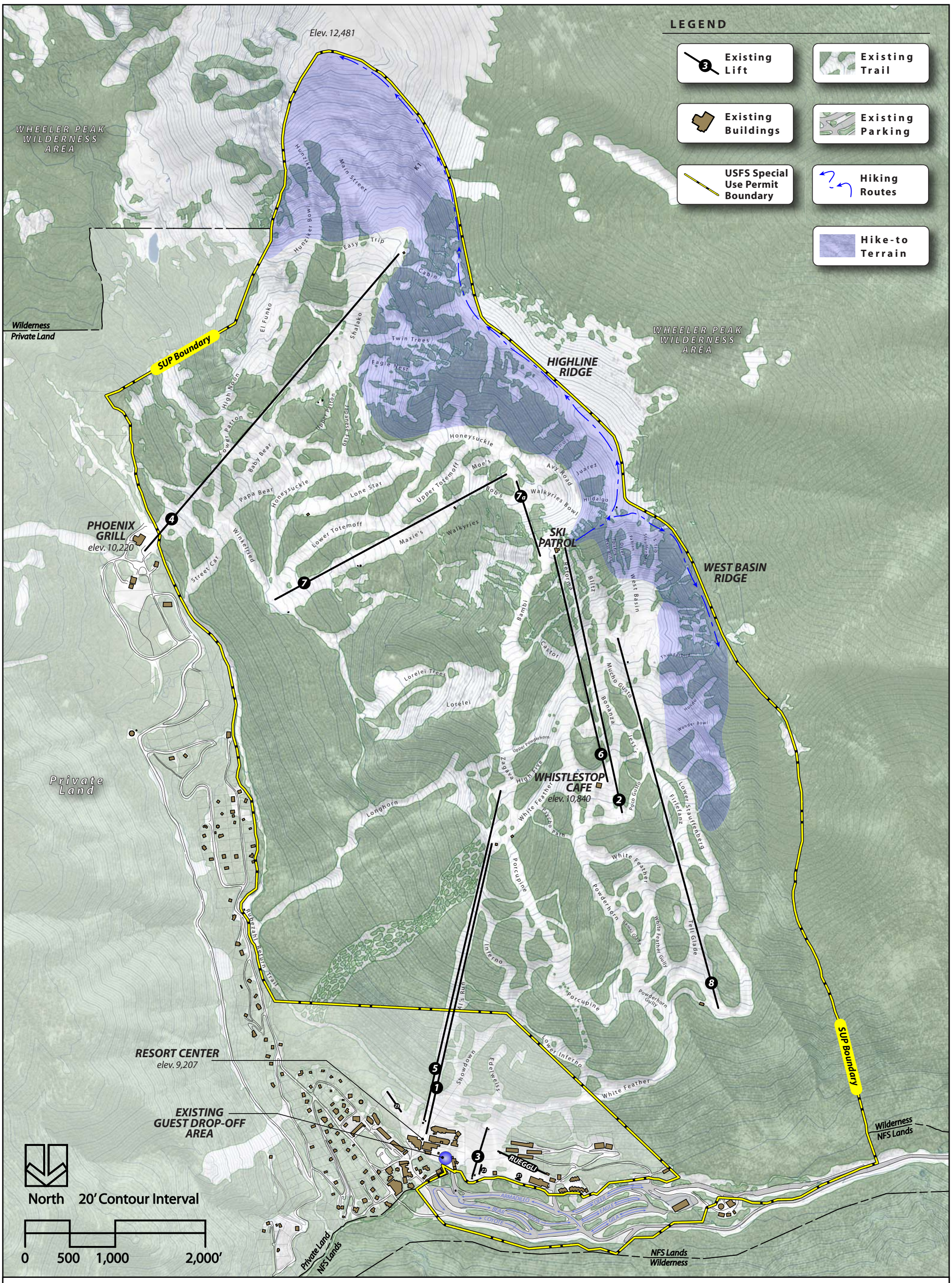
Map 1: Alternative 1 – No Action Alternative

Map 2: Alternative 2 – Proposed Action

Map 3: Alternative 3

Map 4: Proposed Base Area Detail Alternatives 1, 2, and 3

Map 5: Existing Streams and Wetlands



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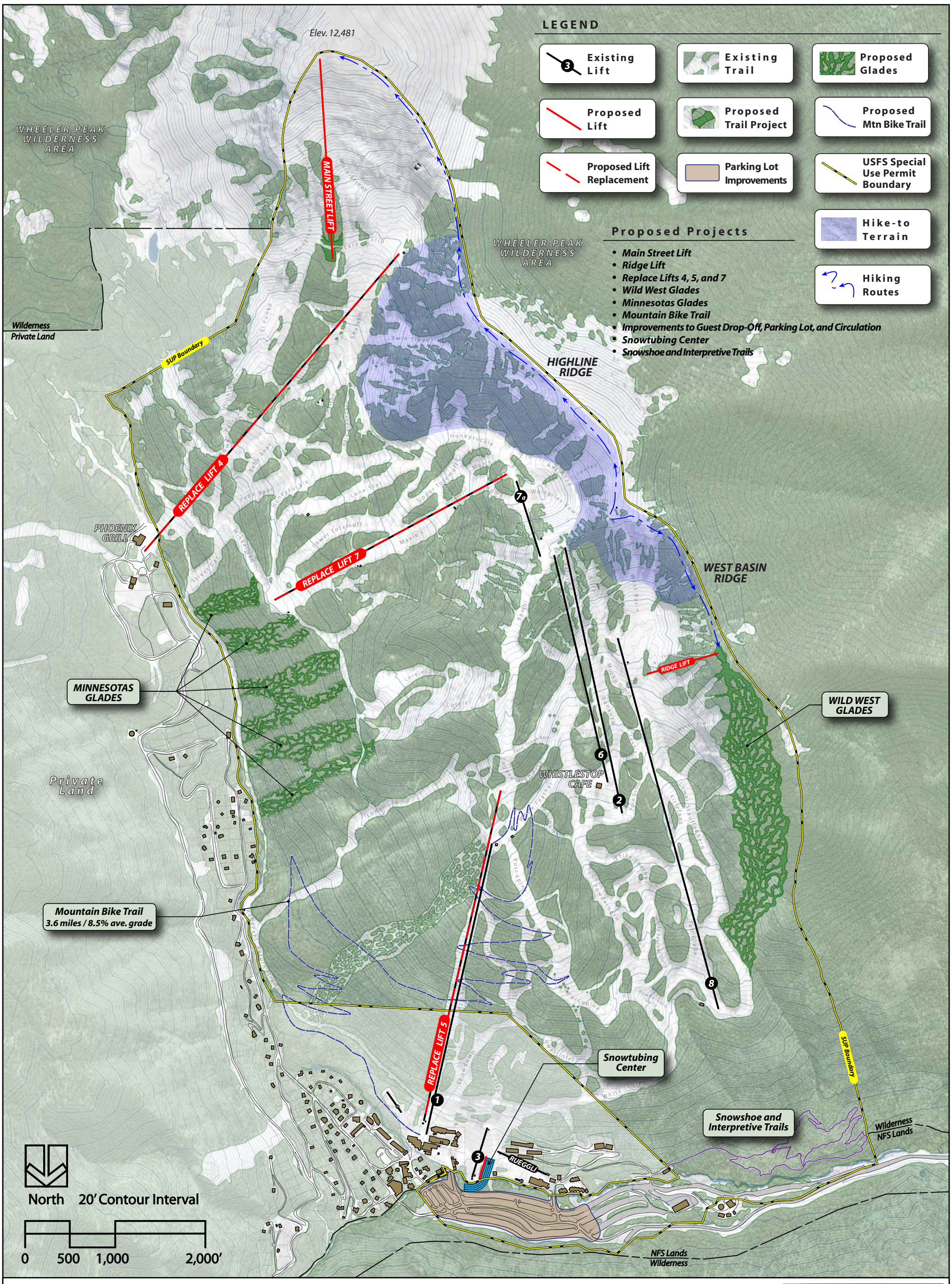
ALTERNATIVE 1
NO ACTION ALTERNATIVE

TAOS SKI VALLEY EIS
MAP 1



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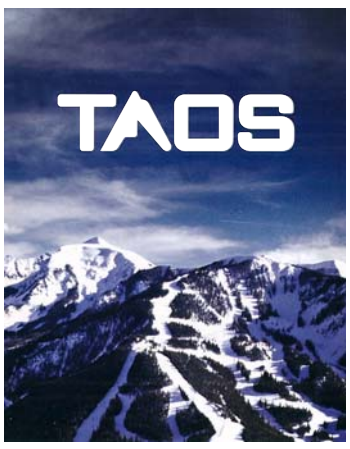
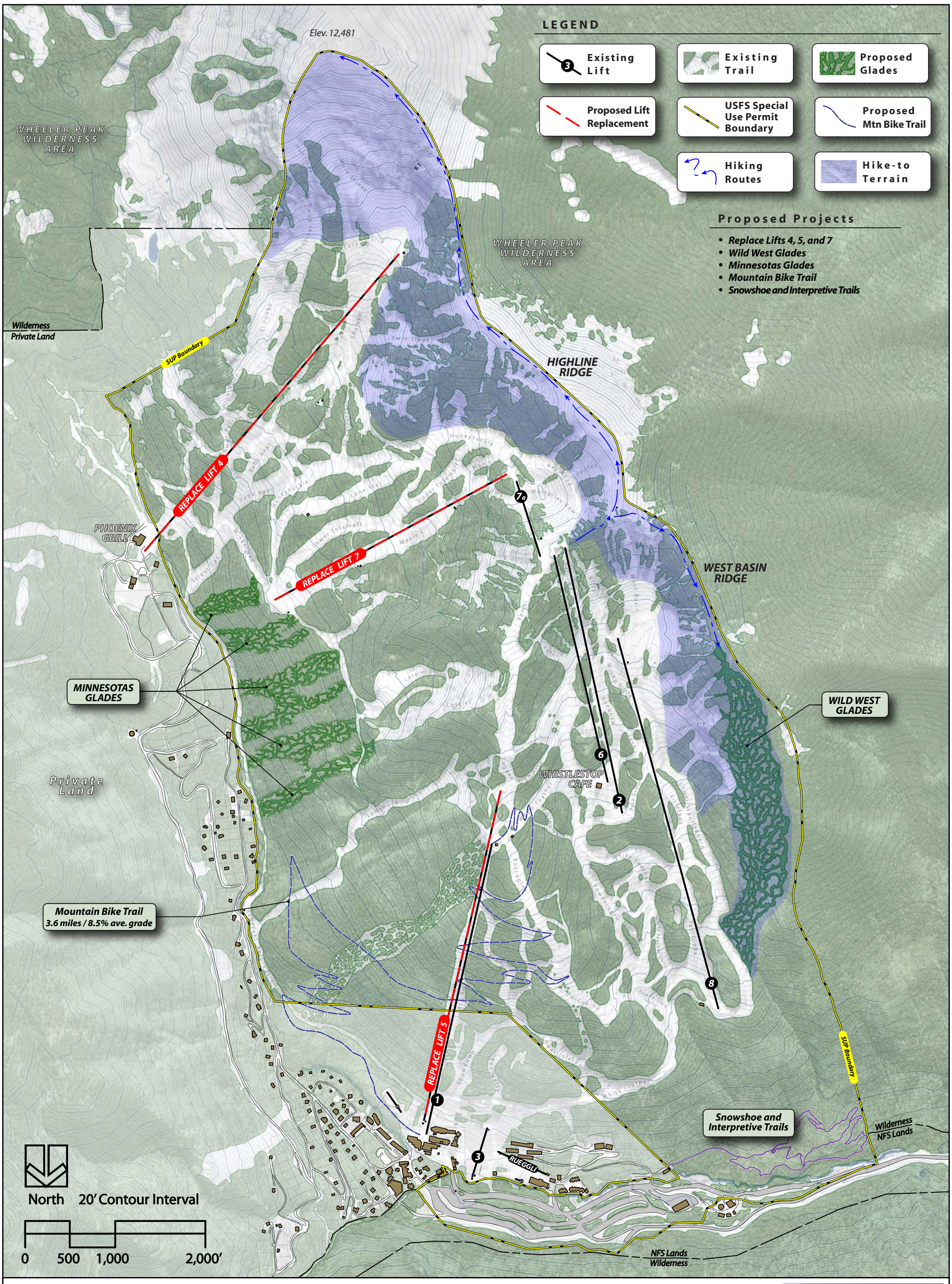
ALTERNATIVE 2
PROPOSED ACTION

TAOS SKI VALLEY EIS
MAP 2





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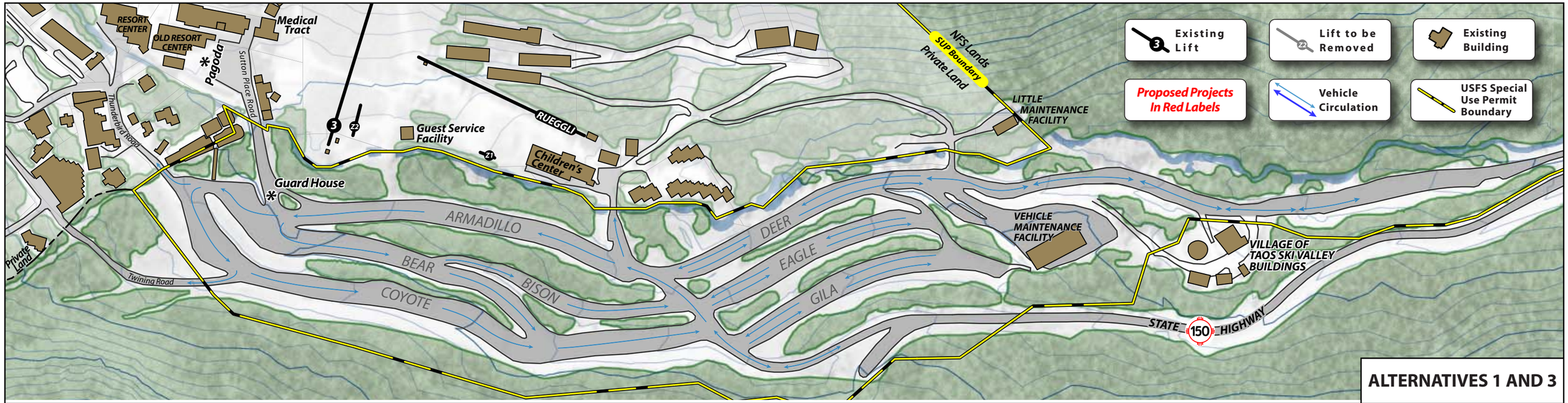
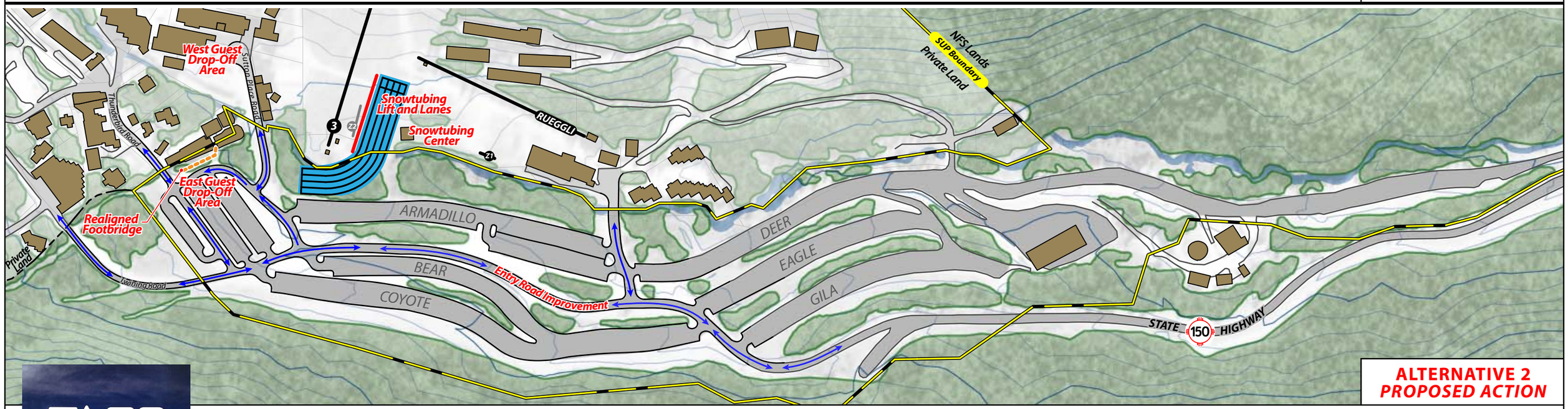
ALTERNATIVE 3

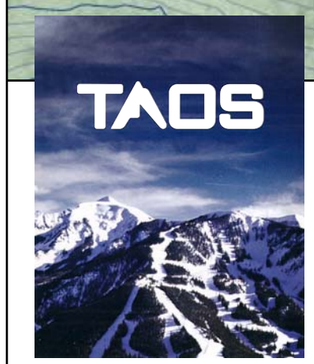
TAOS SKI VALLEY EIS
MAP 3



ALTERNATIVES 1 AND 3



ALTERNATIVE 2
PROPOSED ACTION



PROPOSED BASE AREA DETAIL ALTERNATIVES 1, 2, AND 3

TAOS SKI VALLEY EIS
MAP 4

North

0 150 300 600'

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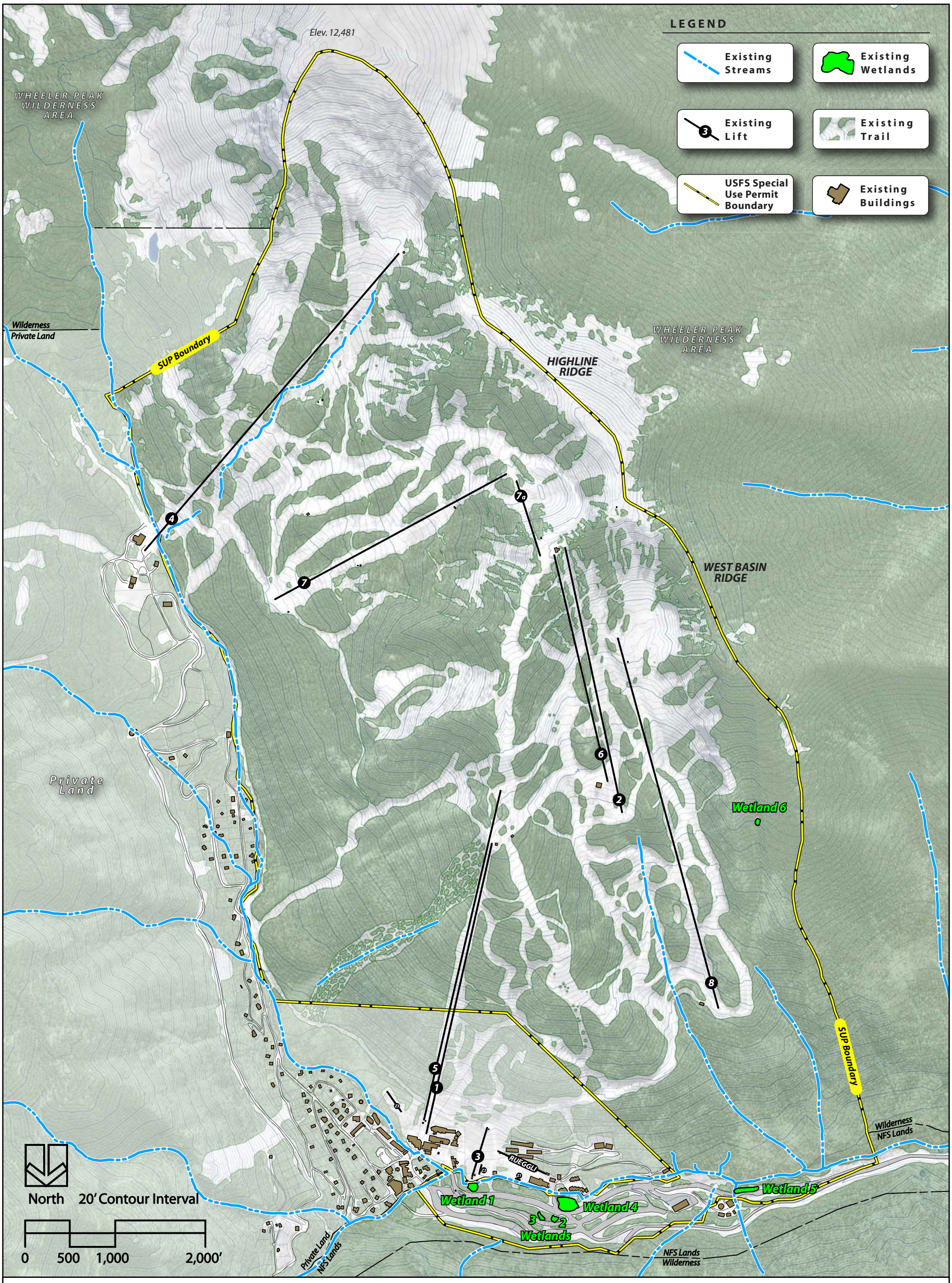

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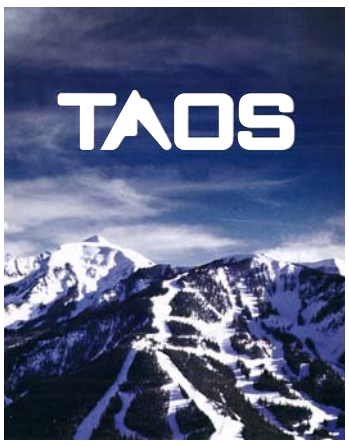
EXISTING STREAMS AND WETLANDS

TAOS SKI VALLEY EIS
MAP 5



Appendix B. Past, Present, and Reasonably Foreseeable Actions Considered in Cumulative Effects Analyses

In their cumulative effects analyses, each specialist establishes which actions overlap spatially and temporally with the direct and indirect effects of alternatives 1, 2, and 3. Cumulative effects are determined by adding the effects of each alternative to the effects of past, present, and future actions. It is important to note the existing condition is the basis of an effects analysis, and the existing condition is the result of impacts from past and present activities. The cumulative effects analyses for each resource adds the impacts of the alternatives (which include the impacts from past and present activities) to the impacts from reasonably foreseeable future actions or events that have the potential to change the physical, social, economic, and/or biological nature of a specified area. Below is a listing of actions considered in the cumulative effects analysis for the Taos Ski Valley's Master Development Plan—Phase 1 Projects. Not all resources considered in Chapter 3 – Affected Environment and Environmental Consequences would be affected by all of these projects.

Cumulative effects analyses presented in chapter 3 resource sections are based on these descriptions and the best available information for each project. Projects are located on National Forest System lands, unless otherwise noted.

Table 28. Reasonably foreseeable actions considered

Project	Project Location	Project Description	Project Approval/ Implementation	Resources Potentially Affected
Taos Ski Valley Development	Taos Ski Valley SUP area and private lands in the base area	Past development of TSV has included clearing, grading, and development of infrastructure on approximately 450 acres of NFS lands throughout its SUP area (1,268 acres) and adjacent private lands. In 2008, the Carson Forest Supervisor signed a decision to implement the *North American* trails at Taos Ski Valley. Since then, TSV has initiated part of this decision by thinning to create the *North American Glade*. A second part of the approved project is a traditional cleared trail, southeast of *North American Glade*, which has yet to be constructed. This expert trail would clear trees on approximately 9.7 acres.	1955 to Present	Recreation Socioeconomics Parking and Ski Area Access Cultural Visuals Water, Wetlands and Soils Wildlife Vegetation
Taos Ski Valley 2010 Master Development Plan	NFS lands within TSV SUP and private lands in the base area	Referred to as Phase 1, this EIS includes only a portion of the numerous new projects proposed in TSV's MDP. Other projects in the MDP, but not proposed in Phase 1 include: the Summit Lift, Burrow Beginner Area (on private land), new trails, trail widening and grading, retaining walls, snow fences, and a mountain top restaurant. The 2010 MDP also includes vegetation management component. Although these projects have been accepted as goals for development and operation of TSV, site specific NEPA analysis would be required prior to implementation of any of the identified projects.	Accepted in 2010, implementation contingent upon site-specific NEPA analysis	Recreation Socioeconomics Parking and Ski Area Access Cultural Visuals Water, Wetlands and Soils Wildlife Vegetation

Table 28. Reasonably foreseeable actions considered

Project	Project Location	Project Description	Project Approval/ Implementation	Resources Potentially Affected
Taos Ski Valley Summer Operations Plan	National Forest System lands within TSV SUP and private lands in the base area	Taos Ski Valley operates Lift 1 in the summer to provide lift rides as well as on-mountain hiking terrain. Ongoing summer maintenance of ski area infrastructure includes lift and boundary maintenance, drainage management and trail upkeep, and guest service facility repair.	Ongoing	Recreation Water, Wetlands and Soils Wildlife Vegetation
Development within the Village of Taos Ski Valley	Private lands throughout the Village of Taos Ski Valley	Past development of the Village includes construction of roads, residential, commercial and utilities. It is anticipated the Village would continue grow in the future; however, there are no specific proposals at this time. Future development may be limited by the capacity of the Village's wastewater treatment facility.	Ongoing	Recreation Socioeconomics Parking and Ski Area Access Cultural Visuals Water, Wetlands and Soils Wildlife Vegetation
Carson National Forest Questa Ranger District Travel Management Plan	National Forest System lands on the Questa Ranger District	The travel management decision for the Questa RD includes removing a 100' corridor along NM-150, where motor vehicle use had been permitted for the purpose of camping, parking, and fuelwood gathering. This decisions reduces the potential impacts caused by motor vehicles in Rio Hondo Canyon.	Decision made in 11/2011. Currently in appeal filing period.	Recreation Water, Wetlands and Soils Wildlife Vegetation

Table 28. Reasonably foreseeable actions considered

Project	Project Location	Project Description	Project Approval/ Implementation	Resources Potentially Affected
Pattison Trust Development	Private lands in the Pattison Trust	Private land residential development east of the ski area.	Ongoing	Recreation Socioeconomics Parking and Ski Area Access Visuals Water, Wetlands and Soils Wildlife Vegetation
Livestock Grazing Hondo Allotment	Hondo Allotment	The Hondo Allotment is located within the Rio Hondo Canyon, but does not overlap within the TSV SUP area. Effects of livestock grazing within Rio Hondo Canyon is considered, along with the effects of the alternatives.	Ongoing	Socioeconomics Visuals Water, Wetlands and Soils Wildlife Vegetation

Table 28. Reasonably foreseeable actions considered

Project	Project Location	Project Description	Project Approval/ Implementation	Resources Potentially Affected
Village of TSV's proposal under the Townsite Act	NFS lands	Summer of 2011, Village of TSV submitted a proposal under the Townsite Act to acquire approximately 70 acres of NFS lands. It included (1) NFS lands where the wastewater treatment facility is located, (2) all of the existing parking lots on NFS lands currently managed by TSV under its SUP, (3) NFS lands near Alpine Village, and (4) the existing Twining Campground located north of TSV's SUP boundary (Bull-of-the-Woods/Long Canyon trailhead).	Forest Service is still reviewing the proposal and has not made a decision of whether to accept the proposal in part or as a whole.	Since the Forest Service is still considering this Townsite Act proposal, it was not included in the cumulative effects analyses of any resource in this draft EIS. If new information is made available prior to the release of the final EIS, it will be considered.

2010 Master Development Plan

In addition to the 2010 MDP Phase 1 projects that constitute the proposed action analyzed in the EIS, the accepted 2010 MDP includes the following planned projects—each of which would require site-specific NEPA analysis for approval:

Summit Lift

A high-speed detachable lift (the Summit Lift) is planned to be installed from the base area to the summit. The roughly 7,000-foot long Summit Lift would provide expedited access to the top of the mountain, with a ride time of only 7 minutes, accessing almost 2,400 vertical feet of round-trip skiing and riding. It is anticipated that lifts 4 and 5 would be replaced by the Summit Lift.

Burrow Beginner Area

A beginner chairlift is planned in conjunction with the planned 7.8-acre Burrow Beginner Area on private lands in the base area. This roughly 1,300-foot long fixed-grip lift would support new teaching terrain, which TSV is lacking.

Trail 8-09

Planned Trail 8-09 (located between *Jess's* and *Firlefanz*) would be roughly 960 feet long and would require approximately 3.2 acres of clearing. This would add terrain that is similar to *Firlefanz*, which is very popular when the Lift 8 pod opens each season.

Minnesotas Catwalk

The planned Trail 7-10 (Minnesotas Catwalk) would be roughly 3,180 feet long, requiring approximately 4.8 acres of clearing. It would connect the bottom of Lift 7 to the *North American* trails. This would create improved access to the base area from the back side of TSV and would serve as an alternate to the *Rubezahl* return trail that has issues with flat sections.

Previously-approved *North American*

The project area for these trails is on the northeast corner of the SUP area, between *Al's Run* and *Longhorn*, and is bounded at the lower end by *Rubezahl*. As discussed in table 24, TSV constructed the first trail project in 2008—named *North American Glade*. The remaining second project, a traditional trail, approved to the southeast of *North American* is yet to be constructed. This expert trail would be approximately 9.7 acres in area.

Widening and Grading

Taos Ski Valley plans to undertake strategic grading and trail widening projects on select trails on "front side" and "back side" terrain. These projects are designed to, among other things, improve skier/rider circulation; eliminate steep, abrupt pitches; improve access to trails; and aid in early season snowmaking operations.

- Planned widening projects total approximately 3 acres, including the following trails: *Upper Powderhorn*, *Lower Powderhorn*, *Bambi*, *Bambi Glade*, *Upper Totemoff*, *Lower Totemoff*, and *Ruby Gully* (entrance).
- Planned grading projects total approximately 12.5 acres, including the following trails: *Lower Inferno*, *Lower Powderhorn*, *Bambi*, *Upper Totemoff*, *Lower Totemoff*, *Papa Bear*, *Baby Bear*, *Street Car*, *Hunziker* (entrance from Lift 4), *Hunziker* (choke), and *Upper El Funko*.

Retaining Walls

In addition to planned widening and grading projects, approximately 3,300 linear feet of retaining walls are planned along identified narrow segments of existing trails. This would enable these trails segments to be widened.

Snow Retaining Fences

Approximately 2,300 linear feet of snow retaining fences are planned in strategic trail segments to allow the seasonal creation of wider skiing/riding surfaces.

Snowmaking

The Upgrade Plan includes snowmaking line installations to provide more coverage as well as to increase efficiencies. While some of these new lines will enable TSV to provide snowmaking coverage on trails that currently rely only on natural snow, the majority of these new lines will improve snowmaking efficiencies on trails that already have snowmaking coverage—e.g., creating loops and connecting spurs in the existing lines. The Upgrade Plan also includes installing infrastructure necessary to support the existing and planned snowmaking system (e.g., pumps, valves and hydrants). Some infrastructure will be housed in new buildings to be located at the bottoms of Lift 7 and Lift 8.

The Upgrade Plan includes installing snowmaking lines on the following trails (which would increase resort-wide snowmaking coverage by 9 acres—from approximately 193 acres to 202 acres):

- *White Feather* Gully
- *Jess's* to the bottom of Lift 2
- Avy Road spur extension
- *Moe's* to the lower section of *Bob's*, ending at the start of *Upper Maxie's* (new coverage)
- *Upper Shalako* (from the top of Lift 4) to the bottom of *Upper Patton* (new coverage)
- *Papa Bear*
- Mountain Top Restaurant

There is a deficiency of on-mountain guest service space, when compared to anticipated demand. The 2010 MDP would address this need with the construction of a new Mountain Top restaurant. This facility would be sized at between approximately 6,700 and 8,500 square feet, of which 3,500 to 4,300 would be restaurant seating.

Vegetation Management

As the health of forested areas is of obvious and critical importance to TSV and the Carson National Forest, the 2010 MDP contains a vegetation management component. A Vegetation Management Plan (VMP) will address on-going and future forest health issues within the SUP area. The VMP will include a full assessment of forest stands throughout the SUP area in addition to outlining vegetation management projects that will be of **long-term** benefit to forest health. As wildland-urban interfaces (WUI) are of growing concern to mountain communities in reference to wildfires, a VMP will likely address this issue, as well.

Mountain Biking

Interconnected mountain bike trails are planned on the front side and back side of the mountain, for a combined total of approximately 14.6 miles. Based on the success of the proposed trail between the top of Lift 1 and the base area (and future construction of the Summit Lift), additional trails may be considered across the front side and back side terrain. At no time would riding be permitted outside of the SUP area and into the Wheeler Peak Wilderness or nearby tribal lands.

Index

A

alpine larkspur 27, 167, 168

alpine tundra 138, 140, 153, 156, 166, 168, 169, 176–178, 182, 183

American marten 27, 154, 158, 160, 162, 173, 176

B

boreal owl 27, 159, 169, 170, 173, 183

C

Canada lynx 27, 155, 158, 164, 171

Clean Air Act 107, 109

Clean Water Act.....10, 28, 119

climate change 111

comfortable carrying capacity 37, 38, 41, 48, 50, 56, 59, 81, 82, 84–86

Council on Environmental Quality.....9, 35, 80

cultural resource 26, 27, 36, 89–92

D

deer 147, 162, 172

density 28, 29, 46, 99, 159, 169, 179, 184

E

elk 176, 180, 181

Endangered Species Act (ESA) 13, 138, 149, 164

Environmental Protection Agency.....80, 108, 109

Ermine 155, 158, 166

erosion 12, 29, 30, 43, 89, 90, 93, 118, 120, 121, 125, 127–136, 183

Executive Order..... 8, 11, 80, 89, 118, 119

F

Federally Listed Threatened, Endangered, and Proposed Species 149

footbridge.....6, 7, 21, 25, 30, 31, 76, 86

Forest Service Regional Sensitive Species..... 150

G

Greenhouse Gas (GHG).....112–114

groundwater 121, 123, 126

H

high elevation riparian woodland 182, 184

L

long-tailed vole 175

M

macro-invertebrates 176, 181

Management Indicator Species.....10, 11. 138, 149, 163, 168, 175–178

Master Development Plan.....2–7, 9, 15, 16, 30, 31, 35–38, 42, 44–46, 49, 51–53, 57, 60, 61, 64, 73–76, 78, 79, 82, 84, 87, 89, 90, 92, 99, 105, 118, 136, 138

migratory birds 10, 11, 183

mitigation.....1, 7, 15, 17, 18, 25, 80, 90, 103, 115, 116, 131, 136, 181

N

Northern Goshawk.....27, 159, 160, 172, 176

noxious weeds.....28, 30

P

parking.....3, 5–7, 10, 11, 16, 20–22, 24, 26, 31, 33, 37, 41, 61, 62, 76, 81–89, 91, 94, 101, 103–105, 121–124, 126, 130–133, 137, 138, 147, 149, 159, 173, 181

partial retention.....95, 96

particulate matter.....107, 109, 114

pecos fleabane 167

peregrine falcon.....160

pika 165, 166

project design criteria (PDC).....7, 91

R

resident trout.....176, 181

riparian habitat.....181

Rocky Mountain bighorn sheep.....155, 158

S

Section 106.....12, 89

sediment..... 28, 118, 122, 126, 129, 130, 131, 133, 181

sensitive species 10, 11, 27, 138, 151, 157, 164, 176, 183, 184

snowshoe hare 27, 141, 162, 164, 171, 172

southern red-backed vole.....173, 174

Special Use Permit 1, 2, 4, 5, 7, 9, 12, 15, 16, 19, 20, 24, 28, 31, 35, 37, 38, 44–50, 52, 53, 54, 56, 58, 60–62, 73, 74, 77, 78, 81, 84, 87, 89–92, 94–98, 100, 103–108, 121, 122, 125, 129, 136, 138, 185–187

State Historic Preservation Office (SHPO).....89, 90

stream health.....118, 120

T

Taos Pueblo.....8, 9, 10, 22, 61, 64, 74, 76, 77, 89, 90, 92

U

U.S. Army Corps of Engineers 119, 131

U.S. Fish and Wildlife Service 12, 13, 138, 149, 150, 164, 182, 183–185

V

visual quality.....12, 26, 94–96, 103–105

W

water rights 20, 55

water shrew..... 173

water yield 120, 122

western heather vole 174

white-tailed ptarmigan....168, 169, 176, 178, 182

Y

yellow-bellied marmot.....165, 166