

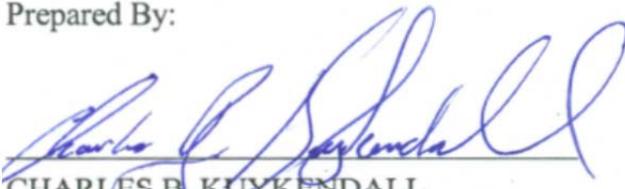
BIOLOGICAL EVALUATION (BE)

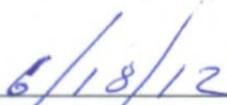
Taos Ski Valley's Master Development Plan Phase 1 Projects

Questa Ranger District, Carson National Forest Taos County, New Mexico

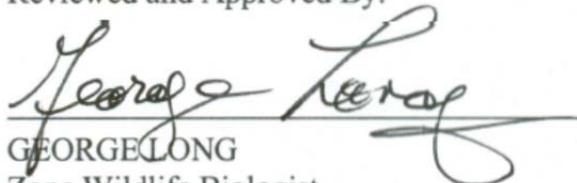


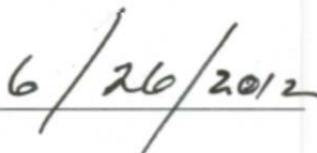
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I. INTRODUCTION

A. Purpose

The purpose of this biological evaluation (BE) is to analyze Taos Ski Valley’s 2010 Master Development Plan (MDP) Phase 1 proposed projects to determine their effects upon Forest Service Southwestern Region’s (Region 3) sensitive species and whether the activities would lead toward federal listing under the Endangered Species Act of 1973, as amended. This BE conforms to the requirements in Forest Service Manual Direction (FSM 2672.42).

The BE analyzes the effects of the preferred alternative (alternative 2) identified in the Draft Environmental Impact Statement for Taos Ski Valley’s 2010 Master Development Plan—Phase 1 Projects on the Questa Ranger District. This analysis is based on best available scientific data.

B. Project Location

Taos Ski Valley (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 of the Carson National Forest. An additional 200 acres of private land encompass the remainder of the resort and related operations.

The ski area is approximately 20 miles outside of the Town of Taos and is accessed via NM-150/Ski Valley Rd, 15 miles from the intersection with US-64.

C. Species Evaluated

The USDA Southwestern Region (R3) Regional Forester’s Sensitive Species 2007 list has 48 species that occur on the Carson National Forest (USDA 2007). The forest developed a list that breaks down the species by ranger district (USDA 2011). Of the 48 species listed, 38 sensitive species have the potential of occurring on the Questa Ranger District, with 17 species analyzed in detail (Table 1). All other species on the Regional Forester’s list do not occur on the Questa Ranger District and would not be impacted by the proposed actions.

Table 1. 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 (<i>Haliaeetus leucocephalus</i>)		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 alternative 2 would have no

Species	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
				effect on this species or its habitat. No further analysis is required.
Boreal owl (<i>Aegolius funereus</i>) State Threatened	X			Analysis required.
Burrowing owl (<i>Athene cucicularia hypugaea</i>)		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 alternative 2 would have no effect on this species or its habitat. No further analysis is required.
Northern goshawk (<i>Accipiter gentiles</i>)	X			Analysis required.
Peregrine falcon (<i>Falco peregrines</i>) State Threatened	X			Analysis required.
Western yellow-billed cuckoo (<i>Coccyzus americanus occidentalis</i>)		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 alternative 2 would have no effect on this species or its habitat. No further analysis is required.
White-tailed ptarmigan (<i>Lagopus leucurus</i>) State Endangered	X			Analysis required.
Rocky Mountain bighorn sheep (<i>Ovis canadensis canadensis</i>)	X			Analysis required.
Canada lynx (<i>Lynx canadensis</i>)	X			Analysis required.
Snowshoe hare (<i>Lepus americanus</i>)	X			Analysis required.
White-tailed jackrabbit (<i>Lepus townsendii campanius</i>)		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 alternative 2 would have no effect on this species or its habitat. No further analysis is required.

Species	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
American marten (<i>Martes americana origenes</i>) State Threatened	X			Analysis required.
Ermine (<i>Mustela erminea murices</i>)	X			Analysis required.
Mink (<i>Neovison vison energumenos</i>)		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. There is some riparian habitat that would be affected by the runnout for the proposed Snow-Tubing area; however, it is not adequate to provide suitable habitat for the mink. Implementation of alternative 2 would have no effect on the mink or its habitat. No further analysis is required.
Yellow-bellied marmot (<i>Marmota flaviventris</i>)	X			Analysis required.
Pika (<i>Ochotona princeps</i>)	X			Analysis required.
Gunnison's prairie dog (<i>Cynomys gunnisoni</i>)		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 the alternative 2 would have no effect on this species or its habitat. No further analysis is required.
New Mexico meadow jumping mouse (<i>Zapus hudsonius luteus</i>)		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 extremely difficult to differentiate without DNA analysis. Their habitats however are significantly different. Implementation of alternative 2 would have no effect on the NM meadow jumping mouse or its habitat. No further analysis is required.
Cinereus (masked) shrew (<i>Sorex cinereus cinereus</i>)		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 (BISON-M 2008c). This type of habitat does not occur within the TSV permit boundary or proposed project areas. Implementation of alternative 2 would have no effect on this species

Species	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
				or its habitat. No further analysis is required.
Dwarf shrew (<i>Sorex nanus</i>)		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 9000', within 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 alternative 2 would have no effect on this species or its habitat. No further analysis is required.
Water shrew (<i>Sorex palustris navigator</i>)	X			Analysis required.
Southern red-backed vole (<i>Clethrionomys gapperi</i>)	X			Analysis required.
Western heather vole (<i>Phenacomys intermedius intermedius</i>)	X			Analysis required.
Long-tailed vole (<i>Microtus longicaudus</i>)	X			Analysis required.
Spotted bat (<i>Euderma maculatum</i>)		X		Spotted bat is generally considered a desert scrub inhabitant but will use a wide variety of habitats including ponderosa pine and open meadows. It 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. Removal of tree canopy associated with the proposed projects would not impact overall roosting or foraging habitats for this species. Implementation of alternative 2 would have no effect on this species or its habitat. No further analysis is required.
Pale Townsend's big-eared bat (<i>Corynorhinus townsendii pallescens</i>)		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

Species	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
				open mine adits or caves for roost sites to support foraging activities. Implementation of alternative 2 would have no effect on this species or its habitat. No further analysis is required.
Northern leopard frog (<i>Rana pipiens</i>)		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 alternative 2 would have no effect on this species or its habitat. No further analysis is required.
Sangre de Cristo pea clam (<i>Pisidium sanguinchristi</i>)		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 alternative 2 would have no effect on this species or its habitat. No further analysis is required.
Nokomis fritillary (<i>Speyeria nokomis Nokomis</i>)		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 9000' elevation in spruce-fir. Implementation of alternative 2 would have no effect on this species or its habitat. No further analysis is required.
Alpine larkspur (<i>Delphinium alpestre</i>)	X			Analysis required.
Arizona willow (<i>Salix arizonica</i>)		X		This species is known to occur in well developed riparian wetland soils and is correlated to deep loamy Cumulic Cryaquolls (<i>Terrestrial Ecosystem Unit #76</i>) on the Carson NF (USDA 1987). This soil type is not found in or adjacent the proposed project areas. Implementation of alternative 2 would have no effect on this species or its habitat. No further analysis is required.
Pecos fleabane (<i>Erigeron subglaber</i>)	X			Analysis required.
Ripley milkvetch (<i>Astragalus ripleyii</i>)		X		This species is found in sagebrush and ponderosa pine vegetation types at elevations below 8,250'. The proposed project areas occur above 9,000' in the spruce-fir to alpine tundra vegetation zones. Implementation of alternative 2 would have no effect on this species or its habitat. No further analysis is required.

Species	Habitat Present	Habitat Not Present	Habitat Present, But Not Affected	Comments
Robust larkspur (<i>Delphinium robustum</i>)			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 alternative 2 would have no effect on this species or its habitat. No further analysis is required.
Yellow lady-slipper (<i>Cypripedium parviflorum</i> var. <i>pubescens</i>)			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 occurrence 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 (Kuykendall 2011). However, no surface disturbance activities would occur in ladyslipper habitat. Implementation of alternative 2 would have no effect on this species or its habitat. No further analysis is required.
Rio Grande chub (<i>Gila pandora</i>)		X		This species occurs below 8,000' elevation in the perennial waters (aquatic habitat) of the Rio Grande. The proposed project areas occur above 9,000'. Implementation of alternative 2 would have no effect on this species or its habitat. No further analysis is required.
Rio Grande cutthroat trout (<i>Oncorhynchus clarki virginalis</i>)		X		The Rio Hondo supports predominately rainbow trout (<i>Oncorhynchus mykiss</i>). Genetic swamping resulting from the presence of rainbows precludes this section of stream from being suitable habitat for Rio Grande cutthroat. Implementation of alternative 2 would have no effect on this species or its habitat. No further analysis is required.
Rio Grande sucker (<i>Catostomus plebeius</i>)		X		This species occurs below 9,000' elevation in the perennial waters of the Rio Grande. The proposed project areas occur above 9,000'. Implementation of alternative 2 would have no effect on this species or its habitat. No further analysis is required.

II. DESCRIPTION OF THE PROPOSED PROJECTS

Alternative 2 is the preferred alternative. Implementation would take place over the course of 5 to 10 years, during the summer after snowmelt. 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.

A. New Lifts

Main Street Lift

The proposed Main Street Lift would not be operated during the summer. The proposal for lift service to Kachina Peak 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 tower would have temporary and permanent ground disturbance. 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 used for understory structural habitat near cleared edges, with excess piled and burned (refer to Table 1 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.

Ridge Lift

The proposed Ridge Lift would not be operated during the summer. The proposal for lift service to West Basin Ridge 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 excess 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.

B. 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.¹ 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) 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.

Minnesotas Glades

The proposal for Minnesotas Glades (accessible from the bottom of Lift 7 area) 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.

C. Lift Replacements

The proposal to replace three of TSV's existing lifts is designed to upgrade the existing lift network, thereby improving operational efficiencies and use of existing and proposed terrain. The only lift that would operate during the summer is Lift 5 out of the base area to the top of Al's Run.

¹ 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.

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.

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.

D. 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 during winter operations. The proposal for the Snowtubing Center 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.

E. 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 would:

- Create trails over the snow once sufficient snow coverage is available. Clearing of some downfall and some 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.

F. 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 would:

- Require limbing and minimal tree removal on new trail segments, where tread width would be approximately 2 feet wide. About 1.7 acres of ground disturbance is possible, as bikers could use any portion of the old road beds in the upper section. Switchbacks would be strategically located on naturally occurring benches and bike trail segments would be placed in areas currently cleared for ski trails. Trees would be lopped and scattered or removed from the site.
- Avoid conflicts with mountain operations vehicles by using old access roads where possible and generally locating the trail away from the existing maintenance roads, to the degree possible.

G. 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. The 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 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.

Parking Lot Reconfiguration

The proposal to improve the parking efficiency and traffic flow 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.

H. Mitigation Measures

Descriptions of alternative 2 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 alternative 2 are analyzed with mitigation measures applied. Table 1 describes the mitigation measures to be applied to proposed activities in alternative 2, with reasons why they are required.

Table 2. Mitigation measures applied to the preferred alternative (alternative 2), by resource

Mitigation Measures	Why
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, try to retain 3 snags per acre greater than 10 to 12” dbh, unless there is a potential hazard to skiers.	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, try to 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.

Mitigation Measures	Why
Within gladed runs, try to 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.
Try to 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, boreal owl, and Forest Service sensitive 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.
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.
Aduqately 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 excessive amounts 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 after leaving 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 project activities. 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.

Mitigation Measures	Why
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.
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 vegetation and water quality of the Rio Hondo.
Lay felled trees across the riparian zone at 20-45 degrees to the stream channel.	To minimize impacts to riparian vegetation 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.
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-	To minimize soil erosion and the introduction of non-native plant species and noxious weeds.

Mitigation Measures	Why
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 certified weed-free seed mixtures prior to implementation.	
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.

III. DESCRIPTION OF THE PROPOSED PROJECT AREAS

The following is a description of the existing condition of habitat and wildlife within the TSV permit area that would most likely be affected by alternative 2. Species that are confirmed to occur in the proposed project areas are identified and analyzed in detail. The EIS includes discussions of the effects on federally listed threatened or endangered species, Forest Service sensitive species, management indicator species (MIS) identified in the Carson forest plan, and migratory birds.

A. New Lifts

Main Street Lift

The proposed Main Street Lift would be accessed from the top of Lift 4 by skiing across Easy Trip to the entrance of Hunziker. The base of the proposed lift would be on a rocky tree covered knoll and would climb southward to a small depression just below the summit of Kachina Peak.



Figure 1. View to the south of proposed Main Street Lift base terminal

Figure 1 shows the proposed location for the base terminal for Main Street lift, located on a small elevated rocky site. At the top of the road and to the left is the entrance to Hunziker Bowl and to the right is Easy Trip, which originates at top of Lift 4. The knoll is primarily covered with Engelmann spruce and whortleberry.



Figure 2. View of proposed Main Street Lift alignment from the upper terminal

Figure 2 is a photo taken during the white-tailed ptarmigan survey and shows much of the habitat in which the proposed Main Street Lift would be located (Kuykendall 2011). The proposed base terminal would be in the far stand of trees at the center of the photo. The top of Lift 4 can be seen

in the open graded area on the far left. The slopes are above timberline and alpine tundra sandwiched between rocky boulder fields. The dark band of vegetation on the opposite side of the loop access road and under Lift 4 is the closest taller *Salix* community to the proposed lift. The vegetation that appears just to the left of the upper spruce-fir stand is a young stand of Engelmann spruce and some subalpine fir.

The vegetation within the proposed Main Street Lift area is comprised of a variety of very prostrate plants. Grasses and sedges include sheep fescue (*Festuca ovina*), alpine bluegrass (*Poa alpine*), arctic bluegrass (*Poa arctica*), timberline bluegrass (*Poa rupicola*), spike trisetum (*Trisetum spicatum*), and black and white sedge (*Carex albonigra*). Other very low growing plants include a willow that is only 1-2 inches tall called summit or snow willow (*Salix navilis saximontana*) and a very prostrate sedum called king's crown (*Sedum rosea*).

The area was accessed for inventory by hiking across the ridge from the radio shack at the top of Chair 2. Yellow-bellied marmots (*Marmota flaviventris*) were encountered all the way to the top of Kachina Peak. One marmot had so much vegetation in its mouth the front of his body was completely obscured behind the stash collection. Signs of Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*) use were also observed starting from the radio shack to the top of Kachina Peak and most of the way down the slope. Evidence of sheep use in this area was greater than expected. Two lambs were observed along the ridge near the old miner's shack. Forage along the ridge is fairly heavily utilized by sheep, marmots, and pikas (*Ochotona princeps*).

The ptarmigan inventory was started on the ridge top west of the terminus of Lift 4 and continued to the top of Kachina Peak and most of the way down the slope in the area of the proposed Main Street Lift. Although no birds were observed or responded to the call, in every case both pikas and marmots responded. Both species surfaced and chirped back. The pikas were very quick to drop out of sight. 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.

Several times during the descent from the peak, a sharp-shinned hawk (*Accipiter striatus*) was observed flying across the open expanse. On review of Dale Stahlecker's tracking data (unpublished), a tagged female golden eagle (*Aquila chrysaetos*) has been frequenting this area on a regular basis. Even though she was not observed on the September 1, 2011 survey, the abundance of marmots may be the attraction to the area (Kuykendall 2011). A large marmot might be more than a young eagle would want to tackle, but the younger smaller ones could be a potential prey species. 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.

The other avian species observed were the typical species most commonly found across the TSV permit area. These include Clark's nutcracker (*Nucifraga columbiana*), gray jay (*Perisoreus canadensis*), dark-eyed junco (*Junco hyemalis*), northern flicker (*Colaptes auratus*), and common raven (*Corvus corax*).

Ridge Lift

The proposed Ridge Lift would be located in West Basin and start a few hundred feet below the top of Lift 8. It would be approximately 800 feet long, gaining 560 feet of elevation, and would terminate at the top of the West Basin Ridge. The proposed Ridge Lift would provide access to new and existing terrain off of West Basin Ridge, including the proposed Wild West Glades.



Figure 3. The base of the proposed Ridge Lift would be just behind the small island of trees at the bottom of the slope and would follow the tree line up to the top of West Basin Ridge

The overall 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 highly 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.

The terrain under the proposed Ridge Lift is very steep and is largely made up of granitic rocky outcrops. The area is generally open due to the avalanche prone topography and the habitat below (in elevation) is alpine tundra. The tree component is relatively sparse, with Engelmann spruce (*Picea engelmannii*) 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 4. A view looking down from the proposed upper Ridge Lift terminal. Soils are thin and rocky with little surface vegetation

During spring goshawk surveys, only a few common avian species were observed using the area (Kuykendall 2011). 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, where trees would be cleared.

Near the proposed lift base is some talus habitat suitable for yellow-bellied marmot and possibly pikas. Marmots are common throughout the TSV permit area in areas that are not densely forested. Marmot habitat likely to be affected by the proposed Ridge Lift would be near the lower terminal. 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.

B. Glades

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. The north facing slope extends for over a half a mile before connecting into Lower Stauffenberg. Most of the gladed area would lie about 200 feet inside the western edge of the SUP boundary. To the east, the glades would be contained 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 to create a mosaic of more and less thinned areas, with a maximum thinning that would create approximately 30 percent canopy cover.

The habitat is densely forested throughout the length of the proposed 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. There is some mortality in the smaller cork-bark fir, but is nothing like the mortality in the other proposed Minnesotas glade area.



Figure 5. The proposed Wild West Glades area is only moderately steep and densely forested with sparse understory dominated by whortleberry

The proposed glades would be mostly located on moderately steep slopes. The understory is sparse and is generally dominated by whortleberry. The canopy is dense and little sunlight reaches 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 2-6 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 occurring outside the forest boundary to the west outside the forest boundary to the west.

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. There is sign of both mule deer (*Odocoileus hemionus*) and Rocky mountain elk (*Cervus elaphus*) on a trail leading into the seep. The seep has not been used as an elk wallow and elk sign is not commonly observed within the TSV permit area. The seep has the typical mossy margins, along with some brook saxifrage (*Saxifraga punctata*). The surface water is only present for about 20 feet. The drainage continues to broaden and is dry from that point down the slope.



Figure 6. Red squirrel midden found within the proposed Wild West Glades area

Previous work in the area show large active red squirrel middens and cone stashing are limited to and occurring in areas where both 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.



Figure 7. Small seep located near the top of the drainage within the proposed Wild West Glades area

The bottom of the proposed glade area flattens out to a gentle slope. At the point where it would swing back to the east and connect with Lower Stauffenberg, the vegetation becomes more diverse and lush. The trees are larger and more widely spaced 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*) become more common at the lower end of the proposed Wild West Glades. Aspen trees (*Populus tremuloides*) also occur more commonly in the overstory near the bottom.

The proposed Wild West Glades area was surveyed for both northern goshawk (*Accipiter gentilis*) and boreal owl (*Aegolius funereus*) (Kuykendall 2011). No occurrences were recorded for either. Other 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*).

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. Mule deer and elk sign were present, but not extensive. Black bear scat was also observed. The one Forest Service sensitive species that likely occurs in the proposed glades area is the American marten (*Martes americana*) which is known to occur throughout most of TSV permit area. The marten likely has plenty of competition from other predators. These include mountain lion (*Felis concolor*), black bear (*Ursus americanus*), long-tailed weasel, bobcat (*Lynx rufus*), and even the American badger (*Taxidea taxus*). Although badgers are not thought to be common at high elevations, one was found trapped inside the Chair 8 base terminal facility and was released by TSV employees.

Minnesotas Glades

The proposed Minnesotas Glades are located on the east side of the TSV permit area. It is generally located below the base of Lift 7 and above the Rubezahl return trail from Street Car almost down to Longhorn. The most remarkable feature of the existing condition in this area is the massive number of standing dead fir trees.



Figure 8. View of proposed Minnesotas Glades showing high tree mortality

Figure 8 is a view looking across the canyon at the slope of the proposed glades area. With a few exceptions, proposed glading could be accomplished by simply thinning out the smaller dead

material. The Minnesotas Glades would be thinned to create a mosaic of more and less thinned areas, with a maximum thinning that would create approximately 30 percent canopy cover. 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 mortality than the rest of the area. The stand immediately adjacent to Street Car has very little 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.



Figure 9. View from the top of the proposed Minnesotas Glades

Figure 9 is a view looking down into the proposed Minnesotas Glade near the base of Lift 7 and only a trace of mortality is visible. The trail opening, along with the thinned areas uphill, have allowed more snowpack and moisture to mitigate the effects of drought and disease along the upper edge of this area. Downhill about 50 yards, the condition is strikingly different. The expanse of dead trees is clearly apparent. Spruce budworm is a common insect that is cyclic across the Carson National Forest. It appears this stand was once densely populated with many small diameter trees in competition with each other. It is likely conditions were optimal for the budworm to thrive, resulting in several years of defoliation. Along with the drought, the infestation was simply more than the trees could withstand. The vast majority of mortality will average 40 to 50 percent and is mostly with cork-bark fir.

There are patches within the proposed glades area that have suffered in excess of 90 percent mortality. Although smaller diameter trees were hardest hit, a significant number of fir trees larger than 12 inches have died also. The Engelmann spruce shows signs of insect damage, but proved to be hardier than cork-bark fir, with a much higher survival rate.

Except for the eastern edge of the proposed Minnesotas Glades, the terrain is generally steeper and more challenging than where the Wild West Glades is proposed. There are more benches and steep drops, as opposed to a consistent grade. The understory is also 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*).

The proposed Minnesotas Glades area was surveyed for both northern goshawk and boreal owl (Kuykendall 2011). 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. Other avian species that were recorded during inventory surveys include the 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 (Kuykendall 2011). 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.

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.

No goshawks were observed in the area, likely because stands are very dense and do not lend themselves to flight of the large accipiter. On the other hand, sharp-shinned hawks were commonly observed throughout the TSV permit area. The much smaller accipiter is much more suited for flight in the tight forest conditions.

C. Lift Replacements - Lifts 4, 5, and 7

Lifts 4, 5, and 7 are proposed for upgrading to increase efficiency, skier distribution, and capacity. All of these lifts are located where slopes are 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 the dense grasses limits the establishment of other plants. The grasses include both native varieties and those commonly used for watershed restoration and reseeded. Chairs 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. On some of the extremely rocky and shallow soils where other plants really struggle, mountain figwort (*Scrophularia lanceolata*) seems to grow fairly well.

Lift 4 runs from the Phoenix to the base of Kachina Basin, and is approximately 4,200 feet long. Some areas are similar to those described above, but this lift does cross over more diverse habitats than the other two chairs. 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.



Figure 10. View of the existing Lift 4 about midway down the slope

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 Chairs 4 and 7, while Lift 5 would likely have fewer than the existing lift. Figure 11 illustrates the relatively small footprint of a tower base. There is about 9-10 square feet of surface area. The photo also shows the typical response to revegetation along the disturbed corridor. Since the lift corridors have already been cleared, there would be little disturbance to the vegetation that has reestablished on the slope.

All of the wildlife species within the TSV permit area from black bear and mule deer, down to mice and voles 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*). A nest with eggs was located near the avalauncher site in Kachina Basin a couple of years ago.

Snowtubing Center

After the initial proposal was evaluated, the proposed site for the Snowtubing Center was moved to the base of Lift 3. The proposed tubing runs would use Strawberry Hill on TSV property and cross the Rio Hondo on the existing old “box car bridge”. About a half an acre of run-out is proposed on National Forest System (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 (*Heracleum 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.

Adventure Center

The proposed Adventure Center (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 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 trees significantly larger and more widely spaced, than in other proposed project areas that were inventoried. Because of the high percentage of deciduous aspen, the canopy would seem 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 pratensis*), 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 porteri*), 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.

This area was surveyed for northern goshawk, a Forest Service sensitive species, and Mexican spotted owl, a federally listed species (Kuykendall 2011). No occurrences were recorded for either. 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.

Mountain Bike Trail

The upper portion of the proposed Mountain Bike Trail would primarily follow a series of switchbacks on existing disturbed surfaces from old roads and trails. It would start at the top of Lift 1, making several turns down White Feather to an old road that crosses the top of Psycho Path. It would switchback between Porcupine and Al's Run, mostly staying on the old lift line access roads.

For several hundred yards, additional trail would be gained by traversing through the trees and connecting with another roadbed. 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 pratensis*) 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 clearing of ski runs reduces the consumption of ground water that might normally be taken up by trees. This can result in a surface seep, such as the one in Al's Run, where the proposed trail would cross. The seep surfaces in the old road and could be mitigated with a small culvert.

The proposed Mountain Bike Trail would leave the old road on Al's Run and follow the contour of the slope to the east and cross the North American Glade. Deer naturally follow openings and paths such as the old access road. At the point where it switches back they will often create a game trail into the woods.



Figure 11. An existing game trail along the route for the proposed Mountain Bike Trail

Figure 11 shows how deer will create a game trail into the woods at the end of a switch back. The proposed bike trail follows this trail for almost a hundred yards before it veers away. This game trail is about one foot wide and has some encroaching vegetation. For comparison, the bike trail is proposed to be 24 inches wide and would likely be void of any encroaching vegetation. Herbaceous groundcover in most of the wooded areas where the proposed route traverses is not very diverse and normally dominated by shade tolerant whortleberry.

Once the proposed trail reaches the recently gladed North American Trial, signs of increased understory diversity already exist. The canopy cover in the newly gladed 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.

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 Trail. It is fairly deeply incised and has a small surface flow for about 100 yards. The crossing would require either a log culvert with a surface tread or even a small bridge for mitigation. 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 Trail. It then would cross and parallel Rubezahl to the base area.

Parking Lot Reconfiguration and Guest Drop-Off Areas

The existing conditions in the parking areas are paved parking lots and transportation routes with narrow stringers of trees 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. There are several modifications proposed in the paved parking areas that could result in some removal of trees or previously disturbed and revegetated sites.

IV. FOREST SERVICE SENSITIVE SPECIES ANALYZED IN DETAIL

A. Boreal Owl

Species Account and Habitat

The boreal owl inhabits a variety of forest habitats from deciduous forests to mixed conifer forests and subalpine forests (Hayward 1997). Southern Rocky Mountain populations tend to occur in high subalpine forests (Hayward 1994). The boreal owl is known to occupy cool micro sites with high canopy cover, high basal coverage and high tree density (Hayward 1997). 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. The boreal owl is listed by the State of New Mexico as Threatened.

Preferred foraging habitat is in mature older forests, especially mature spruce-fir forests (Ibid.). Prey is mainly made up of small rodents, especially red-backed voles (*Clethrionomys gapperi*). Birds and insects are also part of their diet in small amounts.

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 (Kuykendall 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 (Kuykendall 2011). No responses of boreal owls were solicited.

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.

Direct and Indirect Effects

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.

Preferred boreal owl foraging habitat is in mature older forests, especially mature spruce-fir forests. 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.

Hadley and Wilson (2004) investigated short-term effects of ski-run development on the dynamics of small mammal populations at Vail Ski Area, Colorado. They compared a new ski run, an experimental ski run with added woody debris, a forest adjacent to a new ski run, and a control forest outside ski development. In four summers (1998-2001), 16,800 trap nights resulted in 1,276 captures of 668 individuals. Before ski run development, red-backed voles were most abundant in forested areas, but after, density was greatest in the forested site adjacent to a new ski run and next highest on the experimental ski run. Red-backed vole survival was similar across sites and years.

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 as snag retention objectives are included in the mitigation measures. 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.²

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.

² See discussion in Northern Goshawk section on the effects of pile burning.

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.

Summary of Effects

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.

B. Northern Goshawk

Species Account and Habitat

Northern goshawk is recognized as a forest generalist, requiring a mixture of habitat diversity (Reynolds et al. 1992). The highest potential for habitat exists in ponderosa pine and mixed conifer stands with large 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 (Ibid.). 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 under story, and interspersed of vegetation structure stage are important features as it relates to the presence and condition of prey populations (Ibid.).

Goshawk foraging areas are expansive, with goshawks focusing on foraging in and adjacent to forests. This includes small open meadows near to, 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 (Reynolds et al. 1992). Prey species are primarily made up of small mammals with a large biomass relative to other prey species taken (Ibid.). Prey species include rabbits, hares, squirrels, and grouse (Ibid.). In a review of the scientific literature, Reynolds and others (1992) stated goshawks consume one to two prey per day and that prey base species abundance is one of three key factors limiting current goshawk populations. Therefore to maintain goshawk population viability it is important to maintain prey base species habitat in good to excellent condition.

The TSV permit area is likely to be frequented by the northern goshawk and occasionally hunted. 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, Snowshoe Trails, and Mountain Bike Trail project areas (Kuykendall 2011). 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 snowshoe trails are proposed. However, this area would be near the Village of TSV's sewage treatment plant, maintenance buildings, parking lot, and highway and 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 (Kuykendall 2011). Great horned owls would likely prey on any future goshawk nests.

The TSV permit area is much better suited for sharp-shinned hawks, than its larger cousin. Sharp-shinned hawks are quite common throughout the area, and are not special status species.

Direct and Indirect Effects

The proposed snowshoe trail area contains the best of the potential goshawk habitat. Alternative 2 would not alter the habitat. The proposed Main Street and Ridge Lift construction would involve tree clearing (mostly Engelmann spruce) to create approximately 2.3 acres of narrow openings for the lift lines.

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 species. Even though glading would likely improve habitat for goshawk prey species, it is unlikely to be significant enough to influence the sustained presence of such a large avian predator. The proposed actions would probably be insignificant with regard beneficial effects that may influence the future use of the area by goshawks.

Summary of Effects

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 could still be frequented as part of a larger goshawk foraging territory. There would be no noticeable effect on goshawk prey to the extent that could influence frequenting to the area.

C. Peregrine Falcon

Species Account and Habitat

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 only one known peregrine falcon nest site with foraging range that overlaps the proposed project areas. The peregrine falcon is listed by the State of New Mexico as Threatened.

Direct and Indirect Effects

Given that the hunting range of this species may exceed 100,000 acres, implementation of the proposed projects would not be measurable or significant in scope. The proposed glading projects

are likely to provide some increase in prey species locally, but are insignificant over the larger scope relative to the peregrine falcon.

Summary of Effects

The peregrine falcon and its habitat would not be negatively affected by alternative 2.

D. White-tailed Ptarmigan

Species Account and Habitat

The white-tailed ptarmigan is a Forest Service sensitive species, a Carson forest plan management indicator species, and is listed by the State of New Mexico as Endangered. The Center for Biological Diversity has petitioned the U.S. Fish and Wildlife Service to list the ptarmigan as federally endangered (CBD 2010).

The habitat for white-tailed ptarmigan is alpine tundra and subalpine deciduous shrub. Habitats in New Mexico are at the southern edge of the range of this species. By 1981 it was believed this species had become extirpated from the state and reintroduction efforts were made. There are two areas within New Mexico that are known to support the white-tailed ptarmigan. One is the Wheeler Peak Wilderness population and the other is the Pecos Wilderness population. The Kachina Peak area is considered a part of the Wheeler Peak habitat; however, it is outside the wilderness and has been a part of the TSV permit area since the late 1950's.

The proposed Main Street Lift is located in the Kachina Peak basin. This area was inventoried for ptarmigan in 2011 and none were located. However, other observations and reports of ptarmigan using the Kachina Peak area have been made. Rominger reported 5 birds in 2000, and a positive sighting of one individual was made by Wolfe in 2010 (Wolfe et. al 2011; Wolfe 2012).

The most important characteristics of white-tailed ptarmigan wintering habitat is the presence of willow (*Salix* spp.) and soft snow to burrow in (Braun 1971; Braun, et al. 1976). Braun (1979) observed the alpine vegetation was in excellent condition, but felt within the Wheeler Peak Wilderness there is a lack of breeding areas and possibly winter use sites, and bush willows were not abundant. In contrast to the habitats throughout most of Colorado, Braun (1969) noted the taller *Salix* was almost completely lacking in the krummholz of the Wheeler Peak area. He found the dwarf mat forming varieties were locally abundant, but were unavailable from early November to mid-June. Braun also noted the tall willows were the most important factor in determining where ptarmigan occur in Colorado, as it comprises over 90 percent of their diet from October to June. He considered the lack of tall willow to be the limiting factor for ptarmigan in the Wheeler Peak area. Furthermore, Wolfe and others (2011) consider the amount of intact, high alpine habitat is likely the primary factor limiting white-tailed ptarmigan distribution.

The Kachina basin has some taller willows; however, these willows are some distance from the upper habitats and occur 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 available as winter habitat. This area also receives heavy snow pack and is very heavily skied and compacted during the winter. Ptarmigan breeding habitat and summer range extends over much of the Wheeler Peak area. With the exception of the taller willows such as *Salix planifolia*, over several square miles of habitat is ideally suited for ptarmigan, in terms of rock cover and vegetation, from

mid-June to late October (Braun 1969). He also speculates that one of the reasons for the absence of bush species may be the historic livestock grazing use, prior to the 1950's. Within the TSV permit area, the tundra vegetation is fairly well utilized by bighorn sheep and marmots, but is currently in good condition and is not considered to be a limiting factor for summer use by ptarmigan.

Direct and Indirect Effects

The only project proposed in alternative 2 that could potentially affect white-tailed ptarmigan is the Main Street Lift. No significant amount of 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 taller Salix community. The presence of the proposed lift would likely result in six or seven towers within the alpine habitat type. The proposed location would place most of the towers in sedge/grass portions of the tundra habitat (figure 2)

Greater than 99 percent of ptarmigan sightings or sign (feathers and droppings) in New Mexico occurred at elevations greater than 12,300 feet and 67 percent were greater than 12,470 feet elevation (Wolfe et. al 2011; Wolfe 2012). In the Wheeler Peak habitat, all birds detected were between 12,400 feet elevation, with sign being detected as high as 13,100 feet. The proposed Main Street Lift would place the lower terminal at 11,340 feet and upper terminal at about 12,450 feet in elevation. Approximately half of the lift or about 1,200 feet would be above tree line. The upper terminal would be located on a small bench, just below the summit of the peak which is at 12,481 feet. The slopes are quite steep and fall away fairly rapidly. It is estimated there would be approximately 350 linear feet of lift above the 12,300 foot elevation line.

The primary disturbance would be the placement of the upper terminal and one or two towers above the 12,300-foot elevation line. The disturbed habitat would be the alpine grass/sedge community. There would be no access roads constructed to these sites. Construction pads would be built by hand and by any small equipment and materials that could be airlifted to the site. Permanent loss of summer habitat would occur at each footprint of the tower pads and the upper terminal. Any additional disturbed area around the upper terminal would be fairly slow to recover, due to the harsh nature of the site. The lift would not be run in the summer months and would not increase summer habitat disturbance from visitors.

One of the potential effects of the proposed Main Street Lift would be snow compaction. The snow gets quite deep and wind packed in this area, as well as compaction from the existing skier use. There would be additional compaction from increased skiing access. Although Thompson (Thompson, personal conversation 4/24/2012) has found ptarmigan in snow cavities of high elevation skied areas, the increased compaction would likely be detrimental to wintering birds. Additionally, it is not likely the Kachina area is used for wintering habitat, because the more essential elements of winter habitat are largely absent.

Another potential effect to the ptarmigan could be a possible collision with lift cables while flying. There are many documented accounts in Europe of collisions with a wide variety of ski lifts resulting in mortality to ptarmigan and grouse. The worst of these examples likely occurs in Carin Gorm, Scotland (Watson and Moss 2004). In this case, the entire ski area development including the base area was constructed within ptarmigan habitat, which included over 6 miles (10 km) of cables and wires in the core of the habitat. In comparing the Carin Gorm example with the site of the proposed Main Street Lift, there are considerable dissimilarities in terrain and

heavy use of low visibility surface tow lifts. The lack of resemblance makes any direct comparisons somewhat impractical; except for the fact collisions are a possibility.

Ski areas were also studied in France and their effects on black grouse (Miquet 1990). Again, there are significant dissimilarities, including a different species of grouse. The study area of Les Arcs has 10 kilometers of electric and mechanical cables per square kilometer of grouse habitat. It is, however, interesting that 88 percent of collision mortalities occurred in winter (December – April). Also, 95 percent of the accidents occurred on surface tow lines, while only 5 percent were on chairlifts that are much more visible. Of that 5 percent, the majority occurred while the chairs were removed from the cables for repairs. The proposed Main Street Lift is a fixed grip chair design with the chairs attached year-round.

A number of ski areas in Colorado have lifts extending into the alpine tundra habitat and the terrain, elevation, habitats, and overall conditions are significantly more similar to TSV than in Europe. For this analysis, Dr. Braun and Rick Thompson were contacted for more analogous information regarding any white-tailed ptarmigan and cable collisions at Colorado ski areas.

Dr. Braun is likely the most noted and published authority on white-tailed ptarmigan in the Rocky Mountains. He had worked on both Loveland Basin and Keystone ski areas and it was his opinion ptarmigan generally avoided the heavily skied areas in the higher alpine (Braun, personal conversation 4/25/2012). He thought some males might remain at higher elevations, unless the terrain was manicured and the taller Salix was destroyed or rendered inaccessible by grooming. He was unaware of any chairlift cable collision mortality examples in Colorado and none had been reported to him. He was also unaware of any white-tailed ptarmigan studies documenting any collision mortality with chairlifts in Colorado. He did know it had been well documented in Europe, but did not believe it has ever been a problem in Colorado.

Dr. Braun believed maintaining the taller Salix was most important. He also thought the Salix above 12,300 feet elevation was a key to supporting winter forage for the males that remain and winter at higher elevations. Although some biologists have questioned possible conflicts with bighorn sheep, he did not believe there was any direct conflict in this area. He did not think their behavioral use patterns would have any effect on the taller Salix species in winter or summer. The summer foraging species are abundant and not a limiting factor.

Rick Thompson (Biologist, Western Ecosystems) has worked on virtually every ski area in Colorado. He estimated there are about 10 or 12 ski areas that have incorporated at least some alpine habitat into their permit areas and actively ski it (Thompson, personal conversation 4/24/2012). He also said it was normally a minor amount of the permit area and none would have as much as 10 percent of their lift facilities in the alpine.

Rick Thompson had never heard of any ptarmigan collisions with chairlifts or cables in Colorado, and, to his knowledge, none had ever been reported or documented. It is his opinion that ski area activities were more likely to displace ptarmigan from wintering habitat. The key is if the Salix community remains intact after development. Even though he felt there has been deterioration in ptarmigan habitat by ski area development, he has actually located a male ptarmigan in its snow cavity while skiing in actively skied high elevation alpine terrain. In his conversation, he did stress he should not be misunderstood. He does not think ski area development and activity do ptarmigan any good, but if the habitat persists, then the birds seem to persist as well.

Summary of Effects

In summary, winter use of the Kachina basin area by ptarmigan is not improbable, but is not likely for several reasons. First, there is an overall lack of available tall *Salix* species. The lower slopes, where taller *Salix* occurs, are heavily skied and compacted, as well as mechanically groomed. The shrubby component that is important for protection and food is largely absent on the upper slopes of Kachina basin. Second, these slopes are an integral part of the popular TSV hike-to terrain that, when open, are skied until the last vestiges of powder are gone; thus, are currently compacted by wind and skiers. Finally, the upper slopes are also subject to high avalanche dangers and during heavy snowfall are bombarded with the 105 Howitzer and hand thrown explosives to trigger avalanches and achieve safe skiing conditions. This has been a persistent situation for decades. Even though the Main Street Lift proposed in alternative 2 would result in more snow compaction on upper Kachina basin slopes, from an increase in skier/rider use, it is not likely to have any effect on actively used ptarmigan winter habitat.

Ptarmigan mortality could potentially occur through collisions with lift cables during flight. However, the nature of the proposed lift, with attached chairs, is one of high visibility. In addition, the area has very low population numbers and individuals may only occasionally be in the vicinity of the lift. Although ancillary in nature, the input and opinions of two of the most knowledgeable and experienced professionals in the field would indicate a very low probability of occurrence.

There would be the permanent loss of a small area of summer foraging habitat where the actual installations occur, but that habitat type is in abundance and is not a limiting factor for the species.

Considering the context of the affected habitat and the available ptarmigan habitat immediately adjacent to the TSV permit area in Wheeler Peak Wilderness, the proposed Main Street Lift would not negatively affect the ptarmigan or its habitat. Implementation of alternative 2 would not likely lead toward listing of the white-tailed ptarmigan.

E. Rocky Mountain Bighorn Sheep

Species Account and Habitat

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 grazing areas. Forage, water, and escape terrain are the most important components of bighorn sheep habitat (Van Dyke et al. 1983).

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, 33 animals from the Pecos herd were transplanted to the Wheeler Peak Wilderness and adjacent Columbine-Hondo Wilderness Study Area (NMDGF 2005). They have done well. Sheep

were observed during the ptarmigan survey and sheep droppings were wide spread throughout the upper slopes in the area (Kuykendall 2011). A salt block intended to improve sheep distribution was found fairly near the radio shack; it was being utilized.

The New Mexico Department of Game and Fish (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.

Direct and Indirect Effects

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 acres 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 Glade. There is the evidence of use at the radio shack which 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.

Summary of Effects

Given the extensive areas of suitable terrain and undisturbed habitat adjacent TSV, along with their protective wilderness status, the proposed activities within the TSV permit area are relatively insignificant. The Rocky Mountain bighorn and its habitat would not be negatively affected by the alternative 2.

F. Canada Lynx

Species Account and Habitat

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 (USDI 2009) 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. The agency does not believe habitat components needed by the lynx to survive in the long term are present in New Mexico (Hein, personal conversation 9/30/11). 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 its dietary needs. Snowshoe hare do occur within the analysis area, and tracks can be fairly regularly observed in Taos Ski Valley; however, the Carson National Forest is the very southern edge of snowshoe hare range and population numbers are likely too sparse to support sustainable populations of Canada lynx.

Direct and Indirect Effects

It is possible that the lynx could venture into this area, but would likely return further north in search of adequate populations of its preferred prey. Given the extensive adjacent areas of

undisturbed habitat along with the protective wilderness status, the proposed activities within the TSV permit area are relatively insignificant in context.

Summary of Effects

The lynx and its habitat would not be negatively affected by alternative 2.

G. Snowshoe Hare

Species Account and Habitat

Snowshoe hare, within New Mexico, is restricted to the Sangre de Cristo and San Juan Mountains (BISON-M 2008D). 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 (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 (BISON-M 2008d; Ellsworth and Reynolds 2006). Conifers are the primary source of food in winter and the hare eats more herbaceous foods in the summer (Ellsworth and Reynolds 2006). 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 (BISON-M 2008d; Ellsworth and Reynolds 2006). 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) (Ellsworth and Reynolds 2006).

Spruce-fir forests meet cover needs since these species of trees often retain their lower branches and provide effective cover for snowshoe hares (Ibid.). 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 (Bull et al. 2005). 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 (Ellsworth and Reynolds 2006; Buskirk 2002).

Home ranges of snowshoe hare may be from 12 to 24 acres (5 to 0 ha) (Ellsworth and Reynolds 2006). According to NatureServe (2012), 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 (Ellsworth and Reynolds 2006). 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.

Direct and Indirect Effects

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, plus the bottom terminal area. The resulting area would be more rocky outcrops than grasslands. The bottom terminal of the Main Street Lift would remove about 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 preferred forested habitat would be cleared and converted to montane grasslands. Use of these areas would likely be limited to crossing from forested area to forested area. The snowshoe hare is not likely to avoid crossing these relatively narrow 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 some areas unthinned and 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 diverse 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 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 considerable 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 small diameter 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.

Summary of Effects

The proposed Main Street Lift and Ridge Lift would result in the conversion of 2.3 acres of forested snowshoe hare habitat to openings. The glading projects would remain forested habitats, but the gladed portions would not be as dense and would favor the mountain cottontail and other prey species, over the snowshoe hare. There would still be strips and patches within these areas that would remain unthinned; however, the majority of the glades would experience more compacted snow conditions. Site preference by the snowshoe hare would decrease. The potential for predator access would increase and the foraging potential on shrubs and forbs would increase. 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. Overall the snowshoe hare and its habitat would not

be significantly affected by proposed activities over and above existing impacts caused by habitat disturbance and modification from existing developed ski trails.

H. American Marten

Species Account and Habitat

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 (Buskirk 2002). In a review of historical records, Findley et al. (1975) stated martens were first found and described in New Mexico in the Sangre de Cristo Mountains in 1932. Martens have been observed on the Carson National Forest near Lost Lake (1961), Williams Lake (1962), and in the Taos Ski Valley (up to the present). The American marten is listed by the State of New Mexico as Threatened.

Surveys on the Carson National Forest (NF) for the presence of marten were conducted from 1997 to 2001 (Long 2001). 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 proposed action 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 proposed action area as habitat for martens.

Martens select moist site conifer stands with abundant coarse woody debris (CWD), and lengthy fire-return intervals (Buskirk 2002). Citing other research Buskirk (2002) stated there is a high association of marten presence in boreal forests where spruce is dominant with large diameter trees (Vegetation Structural Stage [VSS] 4 and 5) with high canopy cover and within 100 m (328 ft.) of perennial streams and high elevations.³ Cavities caused by decay in these mid-age and mature areas are important to marten for dens and resting sites (Ruggiero, et. al 1998). Finch (1992) stated martens principally utilize spruce-fir forest with a canopy cover of 50 percent or greater, copious amounts of large diameter snags, deadfalls and rock slides. The majority of the analysis area is considered to be suitable marten habitat. Most stands between ski trails are dominated by VSS 2 and 3 with limited VSS 4 and rarely VSS 5.

Tim Fruits, Forestry and Silvicultural Program Manager on the Carson National Forest, has also operated a snow cat to groom snow at TSV for the past 27 years. He has made numerous night time marten and other wildlife sightings during that time. Overall, he reports the number of observations has remained fairly consistent over the years, but says it will vary from year to year. One year martens may be rarely seen by cat operators, while the following year they are reported fairly often (Fruits, personal communication 4/27/2012).

³ 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

Three locations within the permit area are where martens are most commonly observed. One area is around the base of Lift 8. Fruits believes this location is related to prey availability, as he has also seen hares, cottontails, and especially mice in this same area. Another location is between the top of Lift 8 over to and under Lift 2. The third area is on the back side just below Shalako Bowl, in the gladed area along Japanese Flag and Upper Patton. Over the years, Fruits seldom observed martens to be out very far into the ski trail and mostly near the edge of the tree line. He has also seen marten tracks around the generator at the vehicle maintenance center, where cottontails are nearly always be found.

Fruits also related an account over 20 years ago at TSV, when employees thought pine martens were damaging the electrical cables on the equipment around some of the sheds. They set live traps and trapped several martens and hauled them down canyon and released them. Forest Service biologists were informed and examined the sites of damage and found mouse droppings contained the plastic and rubber insulation from the damaged cables. Likely, the mice were chewing on the wires and the martens were preying on the mice.

Bill Etchemendy, Mountain Manager for many years, had photos of martens in his wood shed. He found martens were protecting TSV equipment by preying on mice and other rodents that were damaging the wiring in several facilities, including lift shacks. Where martens had gained access into structures, mice and other rodents were eradicated.

Holyan and others (1998) cite at least a dozen studies and publications either asserting that martens can become “adapted to living in close proximity to man when afforded protection from hunting, trapping and molestation” or recording martens resting at anthropogenic structures including cabins, trailers, debris piles, cut logs, stumps and under woodsheds. In this study the extensive use of more remote cabins by martens is probably more closely related to the woodsheds and lift shacks, than the nice cabins in the Village of Twining. However, many of these sites are only seasonally occupied over a short time period and the covered decks and wood sheds could easily provide the same opportunities for marten foraging, resting or thermoregulation as the cabin sites recorded by Holyan. Of course, the big difference is studies such as this one are located in core high quality habitats with extensive marten populations. Northern New Mexico is on the very edge of this species range.

Certainly the majority of marten habitat is remote and wild and the majority of studies are related to these conditions. However, there are examples of habitats in close proximity to humans similar to the situation at TSV.

Direct and Indirect Effects

Pine martens have also been found to be adaptable to a number of forest types, but avoid or make little use of clearcuts 15 years of age or less, early succession forests and forested types with less than 30 percent canopy cover (Buskirk 2002; Payer and Harrison 2000; Ruggiero and Buskirk 1994; Bennett and Samson 1984). Martens typically utilize (hunt) the edge of meadows surrounded by forests within 32 to 75 ft (10 -23 m) of the forest edge (Buskirk 2002; Bennett and Samson 1984). Beyond the 32 to 75 ft distance martens stop hunting and cross open meadows up to 328 ft. (100 m) wide. Thompson (1994) found prey biomass captured by martens in uncut forests was twice that of clearcut or heavily logged forests in abundant food years and 30 percent greater in scarce food years. Marten local populations can be impacted if timber harvests exceed 25 percent (Buskirk 2002) to 30 percent (Thompson 1997) within marten home ranges.

Clearcutting tree canopy begins to limit the movement of snowshoe hares. Personal observations of snowshoe hare tracks 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 ventured out from the edges of forested areas in large cleared ski runs and usually showed a return route back to the forest stand of origination or the next nearest adjacent forested stand, indicating the preference of snowshoe hares for the protective cover of uncut forested areas. Correspondingly, martens prefer areas with low overhead cover for hunting and travel and are thought to be important for predator avoidance; pine martens have been noted to have significantly higher mortalities in clearcut or heavily logged versus uncut forests (Buskirk 2002; Bull and Heater 2001; Thompson 1994).

Hargis and Bissonette (1995) suggest that the threshold for marten abandonment of habitat occurs when forest landscape openings occupied > 35% of the landscape. Marten mortalities are also higher in clearcut or heavily logged forests than in uncut forests (Thompson 1994) and 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.

In a review of cut and uncut boreal forests Thompson and Colgan (1994) found marten preferred old coniferous forests (uncut) to avoid predation but also because of a greater rate of prey capture compared to the open habitats associated with logged forests.

In a review of the scientific literature Bennett and Samson (1984) found marten population size and condition, and dispersal rates are correlated to small mammal populations. Microtine rodents, particularly red-backed voles (*Clethrionomys spp.*), other voles (*Microtus spp.*), red squirrels (*Tamiasciurus spp.*), snowshoe hare (*Lepus americanus*), birds, insects and berries comprise the most common foods for marten (Buskirk 2002). However, red-backed voles, red squirrels, and snowshoe hares are considered the most important food source for martens (Buskirk 2002, Bull and Blumton 1999). Red squirrels share a unique relationship with marten since middens provide resting sites, natal/den sites and subnivean access (Ruggiero and Buskirk 1994); these areas are associated with large diameter snags and large diameter CWD (Buskirk 2002).

Both martens and snowshoe hare prefer closed forested conditions for predator avoidance. These areas provide soft deep snow in which predators such as coyotes and bobcats have difficulty moving allowing martens and snowshoe hares to maintain relative survival security during winter. However, Ellsworth and Reynolds (2006), and Buskirk (2002) all state that compacted ski runs, roads and cross country ski trails and windblown packed snow on gladed runs provide new avenues for predators that normally are not present in marten and snowshoe hare winter habitats and result in increased mortalities for these species.

It should be noted that most logging consists of harvesting the larger trees and leaving the smaller diameter trees. Thinning of the smaller diameter competition and leaving the larger structure is likely to have differing responses by wildlife species.

The proposed projects that could have effects on marten are the Main Street Lift, Ridge Lift, Wild West Glade and the Minnesotas Glades. The two lifts would remove up to 2.3 acres of forested foraging habitat. However woody debris along the edges of the cleared trails would increase and provide habitat for voles. The Wild West Glading proposal would thin forested conditions over a total of 31.6 acres. The thinning would be in a mosaic pattern not thinning all of those 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 VSS 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 which would be increased significantly as a result of the project. 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 Trail 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 cotton tail.

The proposed Minnesotas Glade covers a total area of 40.3 acres but has a different element as nature has initiated its own thinning process. The combination of drought and insects has resulted in significant mortality of cork bark fir. The overall effects would be similar to the proposed Wild West Glade except thinning would be primarily dead trees.

The other proposed projects such as the bike trail and snowshoe trail could result in temporary displacement from human disturbance but the long term habitat conditions would remain the same as the current conditions.

Summary of Effects

The effects of development at TSV are somewhat enigmatic with regard to the American marten. If the above mentioned studies from other areas held consistent to this site, martens should have abandoned the area 20 to 30 years ago; however, that is not the case. In the vicinity of TSV, the marten population does appear to be persistent. One can only speculate, as to why a population persists amongst human activity and disturbance, while another declines. It may be the very large area of habitat surrounding the TSV permit area is a source of replenishment or the prey production from within the area is adequate to support the species. Given the extensive adjacent areas of suitable and undisturbed habitat, along with their protective wilderness status, the proposed activities within the TSV permit area are relatively small. Alternative 2 would not negatively affect the American marten and its habitat, over and above the existing impacts caused by habitat disturbance and modification from existing developed ski runs.

I. Ermine

Species Account and Habitat

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 (Findley 1975). This small weasel is distinguished from the long-tailed weasel mainly by the absence of the facial mask. 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 (BISON-M 2008a). These habitats are favorable to some *Microtus* species, which are a preferred prey for the ermine. Ermine are likely to occur in the existing ski trails within the analysis area. Observations of this species are reported to be fairly common on the ski slopes at night throughout the winter (Fruits, personal conversation 4/27/2012). Compared to martens observed at TSV, ermine are not restricted to the edge of runs near the trees. Likely, ermine cross the

clearings (even the large ones) in pursuit of deer mice, which are commonly seen running on top of the snow in front of a Snow Cat grooming a ski trail at night.

Direct and Indirect Effects

The prey for this species is likely to be temporarily displaced by the replacements of Lifts 4, 5 and 7 proposed in alternatives 2 and 3 and the two new lifts proposed in alternative 2. All three lift replacements are in habitats that have developed dense grass ground covers. The total area that could be disturbed during the construction of the two new lifts is approximately 2.8 acres. With the exception of the terminals and towers, the disturbed area would be reseeded and eventually returned to the existing habitat conditions.

It is possible the ermine would venture into the upper tundra areas, such as the top half of the proposed Main Street Lift. However, the conditions in the higher alpine are such that the shorter growth forms are generally not adequate to create “runways” common to voles. The alpine habitats might also be above the elevation preferred by the ermine. Author’s note: A long-tailed weasel was observed during inventory of the high elevation tundra habitats.

Summary of Effects

The proposed activities would not negatively affect the ermine or its habitat.

J. Yellow-bellied Marmot and Pika

Species Account and Habitat

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 area. During a field survey along the ridge from the radio tower above Lift 2 to the proposed Main Street Lift on September 1, 2011 the abundance of marmots was such that sightings were almost consistent throughout the survey (Kuykendall 2011). 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. Most of the trails have been reseeded for watershed stabilization and have 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 occur in coexistence with each other. Within the analysis 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.

During ptarmigan surveys a tape was played to solicit ptarmigan response (Kuykendall 2011). 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.

Direct and Indirect Effects

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 acres of existing habitat disturbed. A small amount would be permanently occupied by towers and terminals. There would however be increases in foraging habitat where the tree removal was required 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.

Summary of Effects

Implementation of alternative 2 within the TSV permit area would not negatively affect the yellow-bellied marmot or pika or their habitat.

K. Water Shrew

Species Account and Habitat

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. The species is generally confined to permanent streams (Findley, et. al 1975). This species is closely associated with water and dense streamside vegetation in subalpine coniferous forest. They forage heavily on insects adjacent to and in the aquatic system (Conaway 1952).

Direct and Indirect Effects

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 0.5 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 a narrow strip between the parking lot, the two bridges and the creek.

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 partially 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.

Summary of Effects

The proposed snowtubing run would not have a negative effect on the water shrew.

L. Long-tailed Vole

Species Account and Habitat

The long-tailed vole is a montane forest species, usually associated with meadows and forest edge, and sometimes living in mixed conifer and spruce-fir forest. It is largely dependent on well developed, moderately moist meadows and is often restricted to mesic situations (Findley et.al 1975). This species is widely distributed from Alaska to New Mexico and it occurs in a wide variety of habitats throughout its range. It suspected to be a common prey species of the pine martin. Populations fluctuate dramatically. The long-tailed vole burrows in the soil and requires well drained soils (BISON-M 2008b).

Direct and Indirect Effects

The proposed projects that could have effects on the long-tailed vole are the Wild West Glades, Minnesotas Glades, and lift replacement projects. Both glading projects would likely increase the shrub, forb, and grass components in those areas, along with some degree of forest edge, which would likely be beneficial to this species. Long-tailed voles were not found in old-growth forests in Montana, but were common in areas that were recently cut or burned (Smolen et al. 1987). Dense grassland meadows are associated with the proposed lift replacement locations; however, these are generally not considered mesic (moderately moist). A limited amount of well-developed wet meadow habitat is found within the TSV permit area. There are mesic habitats in the vicinity of Lift 4, but generally is not directly in the lift alignment.

Summary of Effects

The glading proposals would likely improve habitats for the long-tailed vole. The proposed lift replacements would not likely have any direct effect to long-tailed vole habitat. Long-tailed vole and its habitat would not be negatively affected by proposed activities.

M. Southern Red-backed Vole

Species Account and Habitat

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.

Direct and Indirect Effects

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 the red-backed vole should continue to inhabit or use these areas. Implementation of both lifts would increase the amount of 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). Both mice and red-backed voles used fine woody debris in the Pacific Northwest. Study results suggest deer mice would benefit more from piling, while red-backed voles benefit more from lop and scatter. Thus a combination of methods should be considered to accommodate multiple small mammal species (Manning and Edge 2008).

Summary of Effects

The proposed Wild West Glades and Minnesotas Glades should retain and improve 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 excess materials in small brush piles would not have any effect on the vole as long as adequate amounts are retained. The southern red-backed vole and its habitat would not be negatively affected by proposed activities.

N. Western Heather Vole

Species Account and Habitat

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 (BISON-M 2008e). They can be found at high elevations ranging to 12,100 feet above sea level (Findley et al. 1975). 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 (Frey 2003).

The heather vole has different nesting areas depending on the time of year. In the summer, they live in short, underground burrow systems (McAllister et al. 1988). 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. The western heather vole feeds on a variety of plant materials that include bark, buds, berries, forbs, heaths, and seeds. Food caches are collected during both the winter and summer, and placed in piles near the burrow entrance (Bison-M 2008e).

Hadley and Wilson (2004) investigated short-term effects of ski-run development on the dynamics of small mammal populations at Vail Ski Area, Colorado. They compared a new ski run, an experimental ski run with added woody debris, a forest adjacent to a new ski run, and a control forest outside ski development. In four summers (1998-2001), 16,800 trap nights resulted in 1,276 captures of 668 individuals. Before ski-run development, *Clethrionomys gapperi* was most abundant in forested areas, but after development, density was greatest in the forested site, adjacent to a new ski run and next highest to the experimental ski run. *C. gapperi* survival was similar across sites and years. *Peromyscus maniculatus* (deer mouse) and *Tamias minimus* (least chipmunk) densities were greatest on the ski run without woody debris and lowest on the forested control site. Estimated survival of *T. minimus* varied more by year than by site. Greatest densities of *Phenacomys intermedius* occurred on the two ski runs in years following development, and densities were low on forested sites. Given the wide variety of habitats frequented by the heather vole, it could occur in the vicinity 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.

Direct and Indirect Effects

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 down woody material on the forest floor. The burning of excess materials in small brush piles in the gladed areas would not have any effect on the heather vole as long as adequate woody debris is maintained.

Summary of Effects

The western heather vole and its habitat would not be negatively affected by proposed activities.

O. Alpine Larkspur

Species Account and Habitat

This species occurs on subalpine tundra. No *Delphinium* species were observed during the survey of this habitat type (Kuykendall 2011).

Direct and Indirect Effects

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 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 are large areas of suitable larkspur habitat in the alpine meadow habitat type adjacent to the permit area within Wheeler Peak Wilderness.

Summary of Effects

With a limited amount of potential alpine larkspur habitat that would be affected by alternative 2, 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. Given the scope of the area and the minimal area of potential disturbance, the proposed activities within the TSV permit area would not negatively affect alpine larkspur.

P. Pecos Fleabane

Species Account and Habitat

This plant species occurs on rocky, subalpine, open meadows between 10,000 and 11,500 feet elevation. The habitat for this species is present, however no fleabane was observed during the surveys conducted at each of the proposed project areas (Kuykendall 2011). A key habitat component for the fleabane is exposed rock with greater than 50 percent of the surface area.

Direct and Indirect Effects

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, if technically possible.

Summary of Effects

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. Given the scope of the adjacent habitat and the minimal amount of potential disturbance the proposed activities within the TSV permit area would not negatively affect Pecos fleabane.

V. 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 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 primarily 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.

VI. DETERMINATION

Boreal Owl

It is my determination the boreal owl and its habitat would not be negatively affected by alternative 2. Implementation of alternative 2 would not lead the boreal owl toward federal listing. This determination is based on the fact the closest proposal to known habitat is the Minnesotas Glade and thus has probably the most potential to affect this species. Implementation of proposed glade project 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 as snag retention objectives are included in the mitigation measures. Thinning would increase herbaceous forage and woody debris available for prey species habitat and would in effect improve prey availability. It would also promote a more rapid progression to larger diameter trees.

Northern Goshawk

It is my determination the northern goshawk and its habitat would not be negatively affected by alternative 2. Implementation of the alternative 2 would not lead the northern goshawk toward federal listing. This determination is based on the fact the historic and extensive development of the ski area, in essence, precludes any suitable nesting habitat for this species. Although the area may be frequented as a part of a much larger hunting territory, none of the proposed projects would result in a noticeable effect on goshawk prey, to the extent that could influence frequenting to the area.

Peregrine Falcon

It is my determination the peregrine falcon and its habitat would not be negatively affected by alternative 2. Implementation of alternative 2 would not lead the peregrine falcon toward federal listing. This determination is based on the fact there is no suitable cliff habitat on or near the TSV permit area. Given that the hunting range of this species may exceed 100,000 acres, the effects of the proposed projects would not be measurable or significant in scope. The proposed glading projects are likely to provide some increase in prey species locally, but are insignificant over the larger scope relative to the peregrine falcon.

White-tailed Ptarmigan

It is my determination the white-tailed ptarmigan and its habitat would not be negatively affected by alternative 2. Implementation of alternative 2 would not lead the white-tailed ptarmigan toward federal listing. This determination is based on the affected alpine habitat area being very unlikely to provide the necessary habitat attributes for winter habitat. The long-term uses have rendered the nearest wintering (tall) *Salix* population inaccessible. The disturbance factors that have existed for decades, including snow compaction from skiing, mechanical grooming, and regular blasting from the 105 Howitzer and hand thrown explosives for avalanche control, provide a uninviting picture for any winter use. Based on information from Colorado which should provide the most accurate comparability, there appears to be a very low risk in mortality due to collision with the ski lift. There would be no lift operations during the summer months; therefore, no increased attraction by visitors to the subalpine area.

Rocky Mountain Bighorn Sheep

It is my determination the Rocky Mountain bighorn and its habitat would not be negatively affected by alternative 2. Implementation of alternative 2 would not lead this species toward federal listing. This determination is based on the effects of constructing the Main Street Lift. Effects would be limited to temporary displacement of sheep from disturbance during construction and grading approximately 0.1 acre of foraging habitat for the upper terminal and lift towers. The sheep are currently using the area during the summer months. Given the lift will not operate during the summer months; there would be no disturbance to the area after construction. Also the existing population is currently being trapped and relocated to control the numbers. The extensive areas of suitable terrain and undisturbed habitat adjacent to the TSV permit boundary, along with protective wilderness status, the proposed activities within the TSV permit area are relatively small. The Rocky Mountain bighorn and its habitat would not be negatively affected by alternative 2.

Canada Lynx

It is my determination the Canada lynx and its habitat would not be negatively affected by alternative 2. Implementation of alternative 2 would not lead the Canada lynx toward federal listing. This determination is based on discussions with the U.S. Fish and Wildlife Service (USDI 2009), which 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. The agency does not believe habitat components needed by the lynx to survive in the long term are present in New Mexico (Hein, personal conversation 9/30/11). Given the extensive adjacent areas of undisturbed habitat along with the protective wilderness status, the proposed activities within the TSV permit area are relatively small in the larger context.

Snowshoe Hare

It is my determination the snowshoe hare and its habitat would not be significantly affected by alternative 2, over and above existing impacts caused by habitat disturbance and modification from existing developed ski runs. Implementation of alternative 2 would not lead the snowshoe hare toward federal listing. This determination is based on the conversion of only 2.3 acres of forested snowshoe hare habitat to openings. The glading projects would remain forested habitats, but they would not be as dense and would favor the mountain cottontail over the snowshoe hare. There would still be strips and patches within these areas that would remain unthinned; however, the majority of the glades would experience more compacted snow conditions. Given the extensive areas of suitable and undisturbed snowshoe hare habitat adjacent to the TSV permit area, along with their protective wilderness status, the proposed activities within the TSV permit area are relatively minor in context.

American Marten

It is my determination the American marten and its habitat would not be negatively affected by alternative 2, over and above the existing impacts caused by habitat disturbance and modification from existing developed ski runs. Implementation of alternative 2 would not lead the American marten toward federal listing. This determination is based on long-term observations that indicate the species is persistent in the permit area. Given the extensive suitable and undisturbed habitat adjacent to the TSV permit area, along with its protective wilderness status, the proposed activities within the TSV permit area are relatively small in context.

Ermine

It is my determination the ermine and its habitat would not be negatively affected by alternative 2. Implementation of alternative 2 would not lead the ermine toward federal listing. This determination is based on existing habitat created by dense grassy slopes on most of the ski runs, which are advantageous to the normal prey of the species.

Yellow-bellied Marmot and Pika

It is my determination the yellow-bellied marmot and pika and their habitats would not be negatively affected by alternative 2. Implementation of alternative 2 would not lead these species to federal listing. This determination is based on possible temporarily displacement by construction of the proposed Main Street Lift and Ridge Lift. Approximately 0.35 acres of existing habitat would be disturbed, but not likely to be any permanent loss of habitat except for

the small amount occupied by towers and terminals. There may, however, be increases in foraging habitat where the tree removal was required for lift lines. There could also be temporary disturbance and displacement for the proposed lift replacements. The eventual result would be no change in existing habitat conditions.

Water Shrew

It is my determination the water shrew and its habitat would not be negatively affected by alternative 2. Implementation of alternative 2 would not lead the water shrew toward federal listing. This determination is based on the only affected area being a narrow strip between the parking lot, the two bridges, and creek. There is not much intact habitat right in that area. 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 partially impacted by considerable activity. Displacement has likely already occurred. Streamside vegetation downstream is intact and would continue to provide potential water shrew habitat.

Long-tailed Vole

It is my determination the long-tailed vole and its habitat would not be negatively affected by alternative 2. Implementation of alternative 2 would not lead the long-tailed vole toward federal listing. This determination is based on the proposed projects that could have effects on the long-tailed vole, which are the Wild West Glades, and Minnesotas Glades, and the chair replacement projects. The lift replacements are all in previously disturbed habitats. Both glading projects would likely increase the shrub, forb, and grass components, along with some degree of forest edge that would likely be beneficial to this species. Dense grassland meadows are associated with the locations proposed lift replacement projects; however, these are generally not considered mesic, likely the most preferred by the species. A limited amount of well-developed wet meadow habitat is found within the TSV permit area and there are mesic habitats in the vicinity of Lift 4, but generally is not directly in the lift alignment and is not likely to be affected by the lift replacement.

Southern Red-backed Vole

It is my determination the southern red-backed vole and its habitat would not be negatively affected by alternative 2. Implementation of alternative 2 would not lead the southern red-backed vole to federal listing. This determination is based on the proposed Wild West Glades and Minnesotas Glades, which should retain and improve 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 excess materials in small brush piles would not have any effect on the vole, as long as adequate amounts are retained for lop and scatter. The southern red-backed vole and its habitat would not be negatively affected by proposed activities.

Western Heather Vole

It is my determination the western heather vole and its habitat would not be negatively affected by alternative 2. Implementation of alternative 2 would not lead the western heather vole toward federal listing. This determination is based on the proposed projects that could have effects on the western heather vole, which 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 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 down woody material on the forest floor. The burning of excess material in small brush piles in the gladed areas would not have any effect on the heather vole, as long as adequate woody debris is maintained.

In four summers of study at the Vail Ski Area on the effects of ski-run development on the dynamics of small mammal populations, a comparison was made of a new ski run, an experimental ski run with added woody debris, a forest adjacent to a new ski run, and a control forest outside ski development. The greatest densities of western heather voles occurred on the two ski runs in years following development, and densities were low on forested sites.

Alpine Larkspur

It is my determination the alpine larkspur and its habitat would not be negatively affected by alternative 2. Implementation of alternative 2 would not lead alpine larkspur toward federal listing. This determination is based on the only proposed projects that could potentially affect this species, which are the Main Street Lift and the upper terminal of the Lift 4 replacement. Although larkspur was not 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. With a limited amount of potential alpine larkspur habitat that would be affected by alternative 2, 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. Given the context and the minimal area of potential disturbance, the proposed activities within the TSV permit area would not negatively affect alpine larkspur.

Pecos Fleabane

It is my determination the Pecos fleabane and its habitat would not be negatively affected by alternative 2. Implementation of alternative 2 would not lead the Pecos fleabane toward federal listing. This determination is based on the evaluation of the proposed projects that could affect this species, which are the Main Street Lift and the upper terminal site for the Lift 4 replacement. They include 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. Based on the proposed alignment, it is also unlikely that any tower locations or even the upper terminal would be located on the rocky outcrops.

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Appendix A - Past, Present, and Reasonably Foreseeable Actions Considered in Cumulative Effects Analyses

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 this analysis would be affected by all of Phase 1 projects.

Cumulative effects analyses 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 3. 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	<p>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.</p> <p>In 2008, the Carson Forest Supervisor signed a decision to implement the <i>North American</i> trails at Taos Ski Valley. Since then, TSV has initiated part of this decision by thinning to create the <i>North American Glade</i>. A second part of the approved project is a traditional cleared trail, southeast of <i>North American Glade</i>, which has yet to be constructed. This expert trail would clear trees on approximately 9.7 acres.</p>	1955 to Present	<p>Recreation</p> <p>Socioeconomics</p> <p>Parking and Ski Area Access</p> <p>Cultural</p> <p>Visuals</p> <p>Water, Wetlands and Soils</p> <p>Wildlife</p> <p>Vegetation</p>
Taos Ski Valley 2010 Master Development Plan	NFS lands within TSV SUP and private lands in the base area	<p>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.</p>	Accepted in 2010, implementation contingent upon site-specific NEPA analysis	<p>Recreation</p> <p>Socioeconomics</p> <p>Parking and Ski Area Access</p> <p>Cultural</p> <p>Visuals</p> <p>Water, Wetlands and Soils</p> <p>Wildlife</p> <p>Vegetation</p>
Taos Ski Valley Summer Operations Plan	National Forest System lands within TSV SUP and private lands in the base area	<p>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.</p>	Ongoing	<p>Recreation</p> <p>Water, Wetlands and Soils</p> <p>Wildlife</p> <p>Vegetation</p>

Project	Project Location	Project Description	Project Approval/ Implementation	Resources Potentially Affected
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
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

Project	Project Location	Project Description	Project Approval/ Implementation	Resources Potentially Affected
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
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.

A. 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:

B. 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.

C. 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.

D. Trail 8-09

Planned Trail 8-09 (located between *Jess's* and *Firlefanzt*) would be roughly 960 feet long and would require approximately 3.2 acres of clearing. This would add terrain that is similar to *Firlefanzt*, which is very popular when the Lift 8 pod opens each season.

E. 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.

F. 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.

G. 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*.

H. 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.

I. 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.

J. 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.

K. 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.

L. 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.