



United States  
Department of  
Agriculture

Forest Service

Stanislaus  
National Forest



September 2012

# Bear Valley Mountain Resort Expansion (7910)

## Environmental Assessment

Stanislaus National Forest  
Calaveras Ranger District  
Alpine County, CA



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## Table of Contents

|                                                                              |           |
|------------------------------------------------------------------------------|-----------|
| <b>1. Introduction .....</b>                                                 | <b>1</b>  |
| 1.1 Background .....                                                         | 1         |
| 1.2 Forest Plan Direction .....                                              | 4         |
| 1.3 Purpose and Need for Action .....                                        | 4         |
| 1.4 Proposed Action .....                                                    | 7         |
| 1.5 Decision Framework .....                                                 | 7         |
| 1.6 Public Involvement.....                                                  | 7         |
| 1.7 Issues .....                                                             | 9         |
| <b>2. Alternatives.....</b>                                                  | <b>11</b> |
| 2.1 Alternatives Considered in Detail .....                                  | 11        |
| 2.2 Management and Other Requirements Common to All Action Alternatives..... | 20        |
| 2.3 Alternatives Considered But Eliminated from Detailed Study .....         | 25        |
| 2.4 Comparison of Alternatives .....                                         | 28        |
| <b>3. Environmental Consequences .....</b>                                   | <b>33</b> |
| 3.1 Introduction.....                                                        | 33        |
| 3.2 Effects Relative to Issues.....                                          | 36        |
| 3.3 Effects Relative to Significance Factors .....                           | 74        |
| <b>4. Consultation and Coordination .....</b>                                | <b>79</b> |
| <b>References.....</b>                                                       | <b>81</b> |
| <b>A. Bear Valley Mountain Environmental Management Plan.....</b>            | <b>83</b> |
| <b>B. Air Quality and Greenhouse Gas Emissions .....</b>                     | <b>87</b> |

## List of Figures

|          |                                                  |             |
|----------|--------------------------------------------------|-------------|
| Figure 1 | Vicinity Map.....                                | 3           |
| Figure 2 | Alternative 1 (No Action) .....                  | map package |
| Figure 3 | Alternative 2 (Proposed Action).....             | map package |
| Figure 4 | Alternative 3 (Improved Skier Circulation) ..... | map package |
| Figure 5 | Existing Vegetation Communities.....             | map package |

## List of Tables

|             |                                                                                                                                                                            |    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Table 1-1:  | BVM Annual and Average Visitation 1980/81 – 2009/10 .....                                                                                                                  | 2  |
| Table 2-1:  | Terrain Acreage and Distribution by Ability Level – Existing Conditions .....                                                                                              | 12 |
| Table 2-2:  | Terrain Breakdown – Alternative 2 Compared to Alternative 1 .....                                                                                                          | 14 |
| Table 2-3:  | Terrain Breakdown – Alternative 3 Compared to Alternative 1 .....                                                                                                          | 18 |
| Table 2-4:  | Project Specific Clearing and Grading (in acres).....                                                                                                                      | 28 |
| Table 2-5:  | Comparison of Key Elements of Each Alternative .....                                                                                                                       | 29 |
| Table 2-6:  | Summary Comparison of Environmental Consequences by Issue .....                                                                                                            | 30 |
| Table 3-1:  | Endangered, Threatened, Proposed, Candidate Terrestrial and Aquatic<br>Species that were Considered Outside the Geographic or Elevation Range of<br>the Project Area ..... | 37 |
| Table 3-2:  | Vegetation Types in the BVM Project Area .....                                                                                                                             | 38 |
| Table 3-3:  | Estimated Direct, Indirect, and Cumulative Effects for the No Action and Action<br>Alternatives.....                                                                       | 40 |
| Table 3-4:  | Forest Service Management Indicator Species selected for Consideration in<br>the BVM Project Area .....                                                                    | 41 |
| Table 3-5:  | Summary of Impacts to Vegetation Types under Alternatives 2 and 3 .....                                                                                                    | 41 |
| Table 3-6:  | Changes in Spotted Owl and Northern Goshawk Suitable Habitat under<br>Alternative 2.....                                                                                   | 42 |
| Table 3-7:  | Summary of Effect to Management Indicator Species – All Alternatives.....                                                                                                  | 45 |
| Table 3-8:  | Past, Present and Reasonably Foreseeable Future Projects on Public Lands<br>Within the CEAs for Terrestrial Wildlife, Amphibians and Plants.....                           | 48 |
| Table 3-9:  | Existing Soils within the BVM Project Area .....                                                                                                                           | 52 |
| Table 3-10: | Major Soil Cover Classes in the BVM project area – Existing Conditions .....                                                                                               | 53 |
| Table 3-11: | Existing Erosion Rates within the BVM Project Area .....                                                                                                                   | 53 |
| Table 3-12: | Comparison of Detrimental Soil Conditions by Alternative.....                                                                                                              | 54 |
| Table 3-13: | Comparison of Total Erosion by Alternative .....                                                                                                                           | 55 |
| Table 3-14: | Riparian Conservation Areas (RCAs) Adjacent to Aquatic Features .....                                                                                                      | 59 |
| Table 3-15: | Sub-7th Field Mattley Creek Watershed.....                                                                                                                                 | 63 |
| Table 3-16: | 7th Field Mattley Creek Watershed .....                                                                                                                                    | 63 |
| Table 3-17: | Sub-7th Field Blood’s Creek Watershed .....                                                                                                                                | 64 |
| Table 3-18: | 7th Field Blood’s Creek Watershed.....                                                                                                                                     | 64 |
| Table 3-19: | Lift Specifications – Existing Conditions .....                                                                                                                            | 65 |
| Table 3-20: | Existing Parking at BVM .....                                                                                                                                              | 67 |
| Table 3-21: | Terrain Breakdown – Alternative 2 Compared to Existing Conditions.....                                                                                                     | 69 |
| Table 3-22: | Terrain Breakdown – Alternative 3 Compared to Existing Conditions.....                                                                                                     | 72 |
| Table B-1:  | National Ambient Air Quality Standards for Criteria Pollutants .....                                                                                                       | 88 |
| Table B-2:  | NAAQS for California .....                                                                                                                                                 | 90 |
| Table B-3:  | Alpine County Estimated Annual Average Emissions (metric tons) .....                                                                                                       | 91 |
| Table B-4:  | GHG Emissions Summary – Alternatives 1, 2 and 3 .....                                                                                                                      | 94 |
| Table B-5:  | Projects Identified for Consideration in Cumulative Effects .....                                                                                                          | 96 |

# Bear Valley Mountain Resort Expansion (7910) Environmental Assessment

Stanislaus National Forest  
Calaveras Ranger District  
Alpine County, California

## 1. Introduction

The Forest Service prepared this Environmental Assessment (EA) cooperatively with the Bear Valley Mountain Resort (BVM) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This EA discloses potential direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The Action Alternatives respond to goals and objectives outlined in the Stanislaus National Forest Plan Direction (USDA 2010) and the Record of Decision for the Bear Valley Expansion (USDA 1995). Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Calaveras Ranger District Office in Hathaway Pines, California.

This Bear Valley Mountain Resort Expansion (BVM Expansion) EA updates and replaces the previous EA released for public comment in June 2011. It now includes changes and clarifications based on public comments (1.6 Public Involvement).

### 1.1 BACKGROUND

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BVM is located adjacent to Bear Valley Village, California on the western slope of the Sierra Nevada, within unincorporated Alpine County (Sections 6, 7 and 18 of Township 7N, Range 18E). It is about 52 miles east of Angels Camp (Figure 1). BVM is accessed by heading east on Highway 4 and then turning north at the Highway 207 intersection. BVM is located on the Calaveras Ranger District of the Stanislaus National Forest (STF and is operated under a Special Use Permit (SUP). The SUP incorporates about 1,188 acres.

Alpine skiing was introduced on the STF in the 1950s at Dodge Ridge. The region's popularity for alpine skiing prompted the Forest Service to begin exploring other skiing options in the early 1960s. BVM opened to the public for skiing in 1967 under the name "Mt. Reba" and has since become an important winter recreational venue in northern California.

In 1995, a Record of Decision for the *Bear Valley Ski Area Expansion Final Environmental Impact Statement* ([1995 Bear Valley FEIS and ROD] USDA Forest Service 1995) selected Alternative 3 and authorized lift-served skiing opportunities in an undeveloped area known as East Bowl. Full development of the East Bowl facilities (including a parking lot, day lodge, and chairlifts) would occur when necessary and financially feasible for BVM (USDA 1995), *and after additional site-specific NEPA analysis*. At this time, the ski area was owned and operated by Bear Valley Ski Company (BVSC). BVSC's Master Development Plan (MDP) was then developed which outlined an implementation schedule for projects approved in the 1995 Bear Valley FEIS and ROD. The MDP was approved by the Forest Supervisor on July 29, 1997.

In the 1980s BVM averaged 178,000 annual visits. In the 1990s, average annual visitation dropped to about 164,000, and more recently, average annual visitation dropped to roughly 129,000. BVM attributes the steady decline it experienced since the 1980s to a lack of capital investment and improvements combined with an infusion of capital at Lake Tahoe area resorts, including new buildings, lifts, accommodations and guest services. Those investments, combined with a cooperative marketing message, led to increased annual visitation at many Tahoe-area resorts while use decreased at BVM. Table 1-1 provides average annual visitation between the 1980/81 and 2009/10 seasons.

Table 1-1: BVM Annual and Average Visitation 1980/81 – 2009/10

|       | Season                  | Total Visitation |
|-------|-------------------------|------------------|
| 2000s | 2009/10                 | 142,281          |
|       | 2008/09                 | 128,233          |
|       | 2007/08                 | 127,872          |
|       | 2006/07                 | 105,958          |
|       | 2005/06                 | 131,103          |
|       | 2004/05                 | 118,301          |
|       | 2003/04                 | 118,682          |
|       | 2002/03                 | 128,976          |
|       | 2001/02                 | 148,657          |
|       | 2000/01                 | 140,489          |
|       | <i>Ten-Year Average</i> | <i>129,055</i>   |
| 1990s | 1999/2000               | 125,279          |
|       | 1998/99                 | 148,880          |
|       | 1997/98                 | 167,387          |
|       | 1996/97                 | 131,028          |
|       | 1995/96                 | No Data          |
|       | 1994/95                 | No Data          |
|       | 1993/94                 | No Data          |
|       | 1992/93                 | 194,000          |
|       | 1991/92                 | 221,000          |
|       | 1990/91                 | 160,000          |
|       | <i>Ten-Year Average</i> | <i>163,940</i>   |
| 1980s | 1989/90                 | 82,000           |
|       | 1988/89                 | 150,000          |
|       | 1987/88                 | 181,000          |
|       | 1986/87                 | 152,000          |
|       | 1985/86                 | 119,000          |
|       | 1984/85                 | 178,000          |
|       | 1983/84                 | 219,000          |
|       | 1982/83                 | 222,000          |
|       | 1981/82                 | 233,000          |
|       | 1980/81                 | 244,000          |
|       | <i>Ten Year Average</i> | <i>178,000</i>   |



Figure 1 Vicinity Map

## 1.2 FOREST PLAN DIRECTION

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The Forest Service completed the Stanislaus National Forest Land and Resource Management Plan (Forest Plan) on October 28, 1991. The Stanislaus National Forest “Forest Plan Direction” (USDA 2010) presents the current Forest Plan management direction, based on the original Forest Plan as amended. The Forest Plan Direction that applies to this project includes forestwide standards and guidelines (p.33–64) and “Winter Sports Site” management area direction (p. 177–179) that apply to this project. The “Winter Sports Sites” management area direction includes the following statements that apply to the BVM Special Use Permit (SUP) area (p. 177):

### ***Management Emphasis***

Management emphasis for these areas is to provide developed opportunities for winter sports; provide aesthetically pleasing, well maintained, fully equipped facilities for the pleasure and safety of Forest visitors; and to protect proposed winter sports sites for future development. Developed winter sports sites include alpine and nordic ski areas containing vehicle parking areas, lodges and other support facilities, lifts, ski runs and slopes, and intermingled timber stands. This area includes existing sites with recommended expansions and proposed sites.

### ***Bear Valley***

This winter sports site is located within the heavily used Lake Alpine/Mt. Reba area in the northern portion of the Forest. Bear Valley is a major alpine ski resort and the site includes areas for expansion of the existing facilities. It borders the Mokelumne Wilderness to the north and private land at Bear Valley to the south. The resort community of Bear Valley offers a wide range of services to ski area visitors. Alpine skiing is the most popular activity at Bear Valley, with nordic skiing occurring in and around Bear Valley.

## 1.3 PURPOSE AND NEED FOR ACTION

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The purpose of this project is to improve the recreation and economic opportunities available at BVM. This action is needed, because BVM is an important economic and social resource in the rural Highway 4 corridor. However, declining annual visitation over the past two decades affected BVM’s economic viability, as well as its ability to reinvest in infrastructure and terrain projects that benefit users of public lands; i.e., the recreational experience at BVM suffered. As a SUP holder, BVM provides important recreation and economic opportunities on National Forest System (NFS) lands for visitors and local communities. Only if BVM is economically viable can it continue to provide, and improve upon, its recreation offerings on NFS lands. These recreation offerings are contingent upon a large commitment of ongoing infrastructure and fiscal resources on the part of BVM.

This action responds to the goals and objectives outlined in Forest Plan (1.2 Forest Plan Direction) and would help move the project area towards desired conditions by meeting the following goals.

### **PROJECT GOALS**

- a. **Circulation: Improve skier/boarder circulation within the existing ski area and improve access between the ski area and Bear Valley Village.**
- b. **Parking: Increase the efficiency of the parking areas and provide additional parking capacity to meet current and future visitation.**
- c. **Services: Improve guest services.**

Specific purpose and need details related to each of those goals are described below.

## **a. Circulation**

### ***Resort Capacity***

Comfortable Carrying Capacity (CCC) is defined as a level of utilization for a given resort that provides an expected recreational experience, without overburdening the resort infrastructure. CCC does not indicate a maximum level of visitation, but rather the number of visitors that can be “comfortably” accommodated on a daily basis. The accurate estimation of the CCC of a mountain is a complex issue and is the single most important planning criterion for the resort. Related skier service facilities, including base lodge seating, mountain restaurant requirements, restrooms, parking, and other guest services are planned around the proper identification of the mountain’s true capacity.

CCC is derived from the resort’s supply of vertical transport (the vertical feet served combined with the uphill hourly capacities of the lifts) and demand for vertical transport (the aggregate number of runs demanded multiplied by the vertical rise associated with those runs). CCC is calculated by dividing vertical supply (VTF/day) by vertical demand, and factors in the total amount of time spent in the lift waiting line, on the lift itself, and in the downhill descent. It is not uncommon for resorts to experience peak days during which visitation exceeds the CCC by as much as 25 to 30%.

### ***Access/Egress for lower ability level skiers/snowboarders***

The terrain features within the BVM SUP area generally fall into two main areas: “Front Side/Back Side/Lower Mountain” and “Village Side.” The main difference between these two areas is that the Front Side/Back Side/Lower Mountain terrain is lift-served, while the Village Side is not directly lift served. The Village Side is “undeveloped” and not maintained (aside from periodic grooming on select trails).

#### ***Front Side/Back Side/Lower Mountain***

At 1.6 acres, BVM has a shortage of true beginner terrain (the only beginner terrain is accessed off the Panda Carpet). Together with the Panda Carpet, the Cub and Super Cup chairlifts provide access to all beginner and the majority of the novice terrain at BVM; this area is referred to as “Bunny Basin.” This shortage is restrictive in terms of the capacity for teaching first-time and children. Because of this shortage of beginner terrain, BVM needs to focus on improving use of, and circulation through, its present extent of beginner terrain in Bunny Basin.

Low-intermediate and intermediate level skiers/snowboarders using the Polar Express and Pooh Bear chairlifts tend to have difficulty descending back to the base area from Bear Top. This is due to the absence of adequate intermediate and low-intermediate trails from Bear Top down to the base area.

When BVM installed the Polar Express (an upgrade of the Hibernation chairlift) it increased the popularity of the backside of the mountain and as a result, more intermediates (and in some cases, novices) use the terrain served by the Polar Express and Pooh Bear lifts than in the past. While the *Kuma* and *Bear* chairlifts provide out-of-base lift access to intermediate and advanced terrain off of Bear Top (including the Polar Express and Pooh Bear pods), lower ability level skiers/snowboarders (novices through low-intermediates) who ride these lifts have a difficult time returning to the base area.

### **Village Side**

This area includes roughly 500 acres of terrain that is composed of two distinct bowls (Sunrise Bowl and Dardanelle Vista Bowl), glades and over a dozen named runs. This terrain ranges in ability level from intermediate through expert with no low-intermediate, novice or beginner terrain on the Village Side. None of this terrain is lift-served, and guests who choose to enter the Village Side terrain rely on a BVM shuttle to return to the ski area. The Village Side Terrain is patrolled, with *Home Run* and *Lunch Run* groomed periodically.

### **Mix of Skier/Boarder Abilities**

BVM's main base area provides the majority of guest services and facilities with the exception of restrooms on Bear Top. Novice through expert skiers/snowboarders utilizing the *Pooh Bear* and *Polar Express* pods, as well as those offloading the Grizzly Chair, must travel through beginner and novice terrain in Bunny Basin for services other than restrooms. On busy and peak days, the mixing of ability levels in this area creates congestion and detracts from the recreational experience for all ability levels.

### **Access to/from Bear Valley Village**

No convenient access exists for skiers/snowboarders to circulate between the ski area and Bear Valley Village. BVM guests can currently access Bear Valley Village by descending any of a dozen or so named trails, bowls and glades on the Village Side of the ski area. This terrain ranges from intermediate through expert, and two trails are currently groomed. No beginner, novice or low-intermediate trails exist in the Village Side terrain. Once in town, the only means of returning to the ski area is a shuttle system, which provides return trips to the ski area once per hour. These constraints limit and discourage skier/boarder circulation between BVM and Bear Valley Village throughout the day.

## **b. Parking**

BVM provides about 15.1 acres of parking which would accommodate a total of 1,750 cars-at-one-time (roughly 3,850 guests<sup>1</sup>). This is below the calculated resort capacity of 4,690. On peak days throughout the season (typically during the holidays), which occur five-to-ten days throughout the season, BVM does not provide enough parking spaces to accommodate guests.

## **c. Services**

The main base area contains the majority of guest services (e.g., rental, ticketing, food and beverage) and facilities (e.g., base area lodge), with the exception of restrooms located on Bear Top. On peak days, BVM customers experience long lines for food and other services. Overcrowding in the existing day lodge is evident during stormy weather and the mid-day lunch period when all of the existing 675 restaurant seats at the day lodge are being utilized by resort guests. BVM needs additional customer services. Intermediate to expert skiers/snowboarders utilizing the *Pooh Bear* and *Polar Express* pods returning to the base area during egress times (e.g., lunch hours, afternoon egress) must travel through the limited beginner terrain to acquire services other than restrooms.

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<sup>1</sup> This requires diligent management by BVM staff, including parking some guests at the vehicle maintenance facility.

## 1.4 PROPOSED ACTION

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The action proposed by the Forest Service to meet the purpose and need is summarized below. Chapter 2, Alternative 2 (Proposed Action) and Figure 3 (map package) provide detailed descriptions of the Proposed Action.

### a. Circulation

1. Construct the Village Lift to provide lift service between Bear Valley Village and Koala Ridge.
2. Upgrade the Super Cub chairlift to a high-speed detachable quad.
3. Recontour Ego Alley between the top of the Super Cub chairlift and Cub Meadow.
4. Construct the Mokelumne West Bypass to allow lower-level skiers/snowboarders to descend to the base area from Bear Top.
5. Re-grade/Widen Bono's Alley/Water Tank to better accommodate novice skiers/snowboarders descending from Koala Top to the base area.
6. Improve The Village Skiway in order to provide a novice trail from Koala Top to Bear Valley Village. Key to this component of the proposal is selective vegetation removal along the Koala Access Road between Koala Top and the vehicle maintenance facility, as well as a short (roughly 1,500 feet) segment of new trail construction between the vehicle maintenance facility (VMF) and the existing The Village Skiway.
7. Improve Home Run/Lunch Run as return trails to Bear Valley Village (widening/grading and installation of a bridge).

### b. Parking

8. Increase parking capacity within the existing parking lots by about 174 spaces.

### c. Services

9. Construct an on-mountain guest services facility at Bear Top (about 12,500 square feet).

## 1.5 DECISION FRAMEWORK

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The purpose of this EA is to disclose environmental effects of the Proposed Action and Action Alternatives. As the Responsible Official, the Stanislaus National Forest, Forest Supervisor will make a decision based on review of this disclosure document. Given the purpose and need, as the Responsible Official, the Forest Supervisor may decide to: (1) select the proposed action; (2) select one of the other action alternatives; (3) select one of the alternatives after modifying the alternative with additional mitigating measures or combination of activities from other alternatives; or, (4) select the no action alternative, choosing to take no action at this time. As the Responsible Official, the Forest Supervisor also determines whether the selected decision would have a significant impact on the quality of the human environment or not. If a determination is made that the impact is not significant, then a "Finding of No Significant Impact" (FONSI) would be prepared, and the decision of the Forest Supervisor would be documented in a Decision Notice (FSH, 1909.15, 43.2). Significant impacts on the quality of the human environment would require the preparation of an Environmental Impact Statement (40 CFR 1501.4).

## 1.6 PUBLIC INVOLVEMENT

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The Forest Service first listed the BVM Expansion project in the October 2004 issue of the Stanislaus National Forest Schedule of Proposed Actions (SOPA). The Forest distributes the SOPA to about 160

parties and it is available on the internet [<http://www.fs.fed.us/sopa/forest-level.php?110516>]. Prior to scoping, BVM provided a Conceptual Resort Improvement Plan to the public for comments during the 2007/08 winter season. During that season, the plan was posted in the Bear Valley Lodge, at the BVM day lodge, and online at [www.bearvalley.com](http://www.bearvalley.com). Two public meetings were held on weekends during that ski season.

The proposal was provided to the public and other agencies for comment during scoping beginning on August 2, 2008. As part of the public involvement process, the agency held a public meeting in Bear Valley Village for interested parties to attend and provide comments. A total of 11 comment letters were received from various individuals and organizations (Summary of Public Scoping Comments, project file). The Forest used those comments to help identify issues (1.7 Issues).

The BVM Expansion project was presented to the Tuolumne Band of Me-Wuk Indians on May 19, 2010 as part of the annual consultation on the Forest's program of work. Copies of the 2010 forestwide program of work were sent to the Washoe Tribe of Nevada and California. Over the past five years, consultation with the Tuolumne Band of Me-Wuk has occurred on the following projects that are related to BVM (copies were sent to the Washoe Tribe of Nevada and California and other federally recognized tribes):

- 2006** - Bear Valley Mountain Resort Snowmaking and Hibernation Ski Lift Improvements
- Hibernation Ski Lift archaeological Site Evaluations
- 2007** - Village Run Ski Lift
- 2008** - Bear Valley Mountain Resort Expansion (and again in 2010)
- Bear Valley Mountain Resort Transportation Lift
- Round Valley Sno-Park
- Recreational Snowmobile Restrictions at Bear Valley Mountain Resort
- 2010** - Bear Valley Timber Stand Thinning
- Bear Valley Mountain Resort Expansion

A legal notice, announcing the 30-day Opportunity to Comment on the EA appeared in the Union Democrat on June 29, 2011. The Forest mailed copies of the EA to those parties who previously expressed interest in the project. The 30-day comment period ended on July 29, 2011. During the comment period, one interested party (Central Sierra Environmental Resource Center) submitted comments addressing Annual Use, Range of Alternatives, Mokelumne West Trail, Greenhouse Gas Emissions, and Mature Conifer Forest Habitat. A Response to Comments (project file) contains a summary of those comments along with responses. Based on those comments, the EA includes the following changes:

1. Chapter 1.1 (Background) includes the average annual visitation between 1980 and 2010.
2. Chapter 1.3 (Purpose and Need for Action) includes the economic importance of Bear Valley to the Highway 4 corridor.
3. Chapter 3.1 (Introduction) includes an expanded discussion of visual resources.
4. Chapter 3.2 (Effects Relative to Issues) clarifies the average annual visitation at BVM and the effects of Alternative 2 to guest services provided by Bear Top Lodge.
5. Chapter 3.3 (Effects Relative to Significant Factors) includes an updated description of the degree to which the effects on the human environment are likely to be highly controversial.
6. Appendix B (Air Quality and Greenhouse Gas Emissions) addresses greenhouse gas emissions.

## 1.7 ISSUES

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As a result of scoping, the public involvement process (1.6 Public Involvement) helped generate issues related to this proposal. Issues form the basis for the environmental analysis and represent the topics which will be further investigated to disclose the potential effects, or unintended consequences, which may result from implementation of the proposed action or alternatives. Additionally, the analysis provides the opportunity to assess methods which may allow the potential adverse effects to be reduced or mitigated.

The Forest Service separated issues into two groups: relevant issues and non-relevant issues. **Relevant Issues** are used to formulate alternatives, prescribe mitigation measures, or analyze environmental effects. Issues are relevant because of the extent of their geographic distribution, the duration of their effects, or the intensity of interest or resource conflicts. **Non-Relevant Issues** are identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; 4) conjectural and not supported by scientific or factual evidence; or 5) acknowledge a general comment or concern.

Two relevant issues were raised through public scoping related to wildlife habitat and soils/watershed. In addition, the Forest Service considered recreation as a relevant issue. Public comments suggested two alternatives (Modified Current Use and Resource Enhancement) also considered in this analysis (2.3 Alternatives Considered but Eliminated from Detailed Study). As such, relevant issues include:

1. **Wildlife Habitat: Proposed projects and activities, including ground and vegetation disturbance, may affect STF Sensitive wildlife and plant species, Management Indicator species, and Threatened/ Endangered/Candidate species.**

Proposed projects at BVM are consistent with the management direction for National Forest System lands within the SUP area. However, construction, implementation, and operation of these projects may induce impacts to botanical and wildlife resources that can be disclosed, avoided, and/or mitigated.

### *Indicators*

- Acreage of habitat (based on California Wildlife Habitat Relationship [CWHR] classes from the Biological Assessment and Evaluation [BAE]) potentially affected, by species
- Effects to Sensitive, Management Indicator, and Threatened/Endangered/Candidate species

2. **Soils and Watershed: Proposed ground disturbing activities have potential to affect soil and watershed resources.**

Proposed projects at BVM are typical of ski areas operating on NFS and private lands. These projects—including construction of new lifts, replacement of existing lifts, construction of new facilities, and trail grading/vegetation removal—are accompanied by ground disturbance that has potential to increase soil detachment and erosion. If not properly quantified and either avoided or mitigated through best management practices, these activities can impact watershed resources.

### *Indicators*

- Acreage of ground disturbance by alternative
- Acreage of new impervious surfaces and potential for detrimental soil disturbance
- Modeled potential soil erosion related to proposed projects
- Equivalent Roaded Area (ERA) by alternative

3. **Recreation: Proposed lift upgrades and installations, combined with new and improved trails, have potential to increase densities on specific beginner, novice and intermediate terrain.**

Upgrading the existing Super Cub chairlift to a high-speed quad would put more beginner skiers/snowboarders onto *Rodeo* and *Ego Alley* (both of which are novice trails). In conjunction with scaling back the use of the Cub lift, this would make it more difficult for beginner skiers/riders to access suitable terrain in Cub Meadow after unloading Super Cub. In addition, the proposed *Village Lift* could result in congestion, as well as mixing of ability levels, on *Bono's Alley* (an intermediate trail).

*Indicators*

- Terrain acreage, by ability level/by alternative
- Narrative discussion of skier/boarder circulation by alternative

## 2. Alternatives

Chapter 2 describes and compares the alternatives considered for the BVM Expansion project. It presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the Responsible Official and the public. It includes the alternatives considered in detail; management and other requirements common to all action alternatives; alternatives considered but eliminated from detailed study; and, a comparison of alternatives.

### 2.1 ALTERNATIVES CONSIDERED IN DETAIL

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Alternatives 1 through 3 are described in detail below (Figures 2, 3 and 4, map package).

#### **Alternative 1 (No Action)**

Alternative 1 (No Action) serves as a baseline for comparison among the action alternatives (73 Federal Register 143, July 24, 2008; p. 43084–43099). Under the No Action Alternative, the existing parking, lift/trail network and guest services would remain as they are today (Figure 2, map package).

##### **a. Circulation**

###### **RESORT CAPACITY**

Under Alternative 1 (No Action), BVM's CCC would remain at 4,690 guests.

###### **LIFT NETWORK**

Under Alternative 1 (No Action), BVM would continue to maintain eight chairlifts (one four-person, two three-person, and five two-person chairs) and one surface conveyor with no lift service between Bear Valley Village and the ski area.

###### **TERRAIN NETWORK**

Under Alternative 1 (No Action), the BVM terrain distribution by ability level remains unchanged (Table 2-1). Table 2-1 does not distinguish between ability level classifications for the Village Side, as this terrain ranges greatly between intermediate and expert.

###### ***Front Side/Back Side/Lower Mountain***

Under Alternative 1 (No Action), the lift-served trail network within BVM's SUP area (confined to the Front Side/Back Side/Lower Mountain) would remain unchanged, totaling about 467 acres (Table 2-1).

###### ***Village Side***

Under Alternative 1 (No Action), undeveloped terrain on the Village Side of the SUP area would remain as-is, although from an operational perspective, BVM may choose to alter, or increase, the trails that are groomed.

##### **b. Parking**

Under Alternative 1 (No Action), parking at BVM would continue in its existing configuration. No additional parking areas would be constructed at BVM.

##### **c. Services**

Under Alternative 1 (No Action), the majority of skier/boarder services would continue to be provided in the main base area. This would continue to result in increased trail densities, particularly

in lower ability level terrain closer to base area facilities. Access to the restaurants, lodging, and other facilities available in Bear Valley Village from the ski area would continue to require use of intermediate and expert terrain and reliance on the shuttle to return.

Table 2-1: Terrain Acreage and Distribution by Ability Level – Existing Conditions

|                                                                 | Terrain Classification           | Slope Range (%)              | Trail Area (acres)     |
|-----------------------------------------------------------------|----------------------------------|------------------------------|------------------------|
| <b>Lift Served Terrain</b>                                      | Beginner                         | 8 to 12%                     | 1.6                    |
|                                                                 | Novice                           | 13 to 25%                    | 28.9                   |
|                                                                 | Low Intermediate                 | 26 to 35%                    | 58.7                   |
|                                                                 | Intermediate                     | 36 to 45%                    | 73.9                   |
|                                                                 | Adv. Intermediate                | 46 to 55%                    | 65.1                   |
|                                                                 | Expert                           | over 55%<br>(maximum of 70%) | 238.3                  |
|                                                                 | <b>Total Lift-Served Terrain</b> |                              |                        |
| <b>Non-Lift-Served (i.e., Village Side) Terrain<sup>a</sup></b> |                                  |                              | <b>500<sup>b</sup></b> |

<sup>a</sup> slopes range from 36% to 70%

<sup>b</sup> Approximate acreage

## Alternative 2 (Proposed Action)

Alternative 2 (Proposed Action), the action proposed by the Forest Service to meet the purpose and need, is described below (Figure 3, map package).

### a. Circulation

#### RESORT CAPACITY

Alternative 2 (Proposed Action), BVM’s CCC would increase from 4,690 to 5,140. This is due to proposed upgrades in lift capacity, as described below.

#### LIFT NETWORK

##### *Proposed Village Lift*

Alternative 2 (Proposed Action), a new high-speed, detachable *Village Lift* would provide a link between Bear Valley Village and the ski area.<sup>2</sup> The lift would be about 8,100 feet long with a vertical rise of 1,100 feet. About 4,200 linear feet of the lift corridor would be on NFS land, while the remaining 3,900 linear feet would be on private land.

The top terminal would be located adjacent to Koala Rocks (elevation 8,200 feet) on NFS lands within the SUP area. The bottom terminal would be located on private lands in Bear Valley Village (elevation 7,100 feet). Approximately 0.5 acre of ground disturbance would be necessary to construct each lift terminal, and all trees within the disturbance area would be removed.<sup>3</sup> On private lands, the bottom 3,900 feet of the lift corridor and the bottom terminal would require vegetation removal and ground disturbance, as well.

<sup>2</sup> This is proposed as a detachable lift in order to accommodate downloading to Bear Valley Village.

<sup>3</sup> Per the requirements of the California Environmental Quality Act (CEQA), construction on the proposed bottom terminal of the Village Lift on private lands has been considered in an Environmental Impact Report (EIR) that was reviewed/certified by Alpine County.

Fill material would be imported to raise the elevation of the Village Lift top terminal location by about 6 feet in order create an unloading and merging zone on *Bono's Alley* thereby minimizing interactions with skiers/snowboarders unloading from the Koala lift.<sup>4</sup>

### **Proposed Super Cub Upgrade**

Alternative 2 (Proposed Action), the *Super Cub* would be upgraded to a high-speed detachable quad. The proposed *Super Cub* quad would operate at a capacity of about 2,400 people per hour, compared to the existing capacity of 1,100 people per hour. The proposed lift would utilize the existing top terminal location; however, the bottom terminal of the quad would be relocated to a lower elevation to minimize the length of uphill walking from the base area lodge to access the lift. This revised alignment, and upgraded lift, would require strategic tree removal (approximately 15 to 20 trees) for the lift line to accommodate new towers and a 50-foot wide lift corridor. The existing terminals and towers would be removed, while foundations would be left in-place (buried). In conjunction with upgrading Super Cub, BVM would likely reduce reliance on Cub, which would be available on peak days and/or as a dedicated ski school lift.

In conjunction with upgrading Super Cub, Alternative 2 includes terrain re-contouring and vegetation removal between the top terminal of Super Cub and *Ego Alley*. This is proposed to accommodate beginner access to terrain in Cub Meadow when Cub is not operating (Terrain Network below).

### **TERRAIN NETWORK**

Alternative 2 (Proposed Action), BVM would expand and improve its lift-served terrain network, primarily on the Village Side of the SUP area. Table 2-2 compares lift-served and non-lift-served terrain between Alternatives 1 and 2. Table 2-2 does not distinguish among the ability level classifications for non-lift-served terrain the Village Side, as this undeveloped terrain ranges greatly between intermediate and expert.

As indicated in Table 2-2, the Proposed Action would add about 11 acres to BVM's lift-served terrain network (from 466.5 to 477.4). Just less than 8 acres are attributable to the addition of *The Village Skiway* (on the Village Side) to the lift-served terrain network; the rest is attributable to the proposed *Mokelumne West Bypass* on the Front Side. Note that low-intermediate and intermediate terrain *decreases* between Alternatives 1 and 2; the differences are attributable to proposed terrain recontouring on portions of *Bono's Alley* and *Water Tank* that would change the classification of these intermediate/low-intermediate trails to novice. The roughly 21 acres of additional novice terrain identified in Table 2-2 are attributable to:

- Recontouring of existing terrain (*Bono's Alley* and *Water Tank*);
- Addition of the proposed *Mokelumne West Bypass*;
- Reclassification of existing sections of trail above relatively a steep section of *Mokelumne West* to novice; and
- Reclassification of *The Village Skiway* from intermediate to novice.

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<sup>4</sup> The required fill material would be captured from the widening of *Bono's Alley*, described below. Additional material may come from other projects on the mountain or from a Forest Service approved site.

Table 2-2: Terrain Breakdown – Alternative 2 Compared to Alternative 1

|                                                   | Terrain Classification           | Alternative 1<br>Trail Area (acres) | Alternative 2<br>Trail Area (acres) |
|---------------------------------------------------|----------------------------------|-------------------------------------|-------------------------------------|
| Lift Served Terrain                               | Beginner                         | 1.6                                 | 1.6                                 |
|                                                   | Novice                           | 28.9                                | 50.1                                |
|                                                   | Low Intermediate                 | 58.7                                | 52.3                                |
|                                                   | Intermediate                     | 73.9                                | 70.1                                |
|                                                   | Adv. Intermediate                | 65.1                                | 65.1                                |
|                                                   | Expert                           | 238.3                               | 238.3                               |
|                                                   | <b>Total Lift-Served Terrain</b> | <b>466.5</b>                        | <b>477.4</b>                        |
| <b>Non-Lift-Served (i.e., Village Side) Total</b> |                                  | <b>500</b>                          | <b>492.3</b>                        |

#### **Front Side/Back Side/Lower Mountain Terrain**

Front Side terrain improvements are primarily designed to accommodate lower-level skiers and snowboarders as they descend to the base area, but would also help reduce the mixing of ability levels on popular trails.

#### *Mokelumne West Bypass*

The *Mokelumne West Bypass* trail is proposed to accommodate novice skiers and riders descending to the base area from Bear Top (many of whom use the Pooh Bear and Polar Express pods throughout the day). The proposed *Mokelumne West Bypass* would circumvent the existing *Mokelumne West* trail (classified as intermediate).

#### *Ego Alley*

In conjunction with upgrading Super Cub, the upper portion of *Ego Alley* is proposed to be re-contoured to accommodate beginner access from Super Cub to terrain in Cub Meadow. Operationally, this would become important when the Cub chair is not operating. In order to maintain skier/rider circulation on *Ego Alley*, and to avoid user conflicts with more advanced skiers/riders, Bear Valley would employ a mix of signage, fencing, and staffing in this area.

#### *Bono's Alley and Water Tank*

Under Alternative 2 (Proposed Action), novice skiers and riders unloading from the proposed Village Lift would be routed down *Bono's Alley* and *Water Tank*, whereby they could access appropriate terrain served by Super Cub. Accordingly, *Bono's Alley* and *Water Tank* would be anticipated to receive heavier skier/rider traffic (the proposed high-speed, detachable Village Lift would have a capacity of 2,400 people-per-hour) and would need to be widened and re-contoured to better accommodate novice and low-intermediate skiers and riders.

The upper section of the re-contouring project for *Bono's Alley* begins at the proposed top terminal of the Village Lift (adjacent to Koala Rocks), and continues about 100 yards downhill to the summer work road intersection. The upper section would be widened on skier's left by removing the lava cap to widen the corner by 50 feet. This would allow skier traffic to pass well around the unload area from the proposed Village Lift top terminal. Material generated from excavation in this area would be used to widen the lower section on skier's right, as well as to flatten the unloading zone for the Village Lift.

The lower section of the re-contouring project for *Bono's Alley* begins just above the summer work road intersection and continues down to the water tank. Skier's left would be widened by cutting about 15 feet into the hillside. Excavated material would be used to continue the widening along skier's right of *Bono's Alley* down to the water tank

Finally, a portion of *Water Tank* is proposed to be re-contoured to an average slope gradient of 15%. The trail would be reshaped by removing high spots and filling in low spots, which is designed to provide a more consistent grade and better accommodate lower level skiers and riders.

### ***Village Side Terrain***

On the Village Side, no new trails are proposed; however, the Proposed Action includes trail improvements that are designed to work in conjunction with the Village Lift, the installation of which would eliminate the need to take a shuttle back to the ski area from the Village. The lift and terrain projects included in Alternative 2 are designed to make the Village Side more appealing to, and accessible by, a broader range of skiers and riders. For this analysis, mountain planners critically analyzed the Village Side for what would become directly versus "technically" lift-served.

Terrain that would be directly lift-served leads to the bottom lift terminal of the proposed Village Lift—this is limited to *The Village Skiway* (roughly 7.7 acres). The remaining bulk of the Village Side terrain would become "technically" lift-served; this is attributable to the difficulty in reaching the bottom terminal of the proposed Village Lift from terrain within Sunrise Bowl and further west to *Lunch Run*. On the map, it clearly depicts a lift coming out of the Village Side; however, most of the Village Side terrain terminates at Bear Valley Road or Creekside Drive and guests would be required to negotiate roads and flat sections that encumber easy, straight-forward access through Bear Valley Village to reach the bottom terminal. Therefore, under Alternative 2, the remaining terrain in the Village Side—roughly 492 acres—would, from a practical perspective, remain undeveloped and non-lift-served. This concept is explored in detail in the Recreation section of Chapter 3.

Proposed terrain improvement projects on the Village Side were modified since the Proposed Action was originally scoped, as appropriate, to account for the Bear Valley Timber Stand Improvement (TSI) project. The TSI project was approved in September 2010 and is currently being implemented, and encompasses some of the areas within the SUP area that were originally proposed for vegetation removal. Therefore, proposed terrain projects on the Village Side of the BVM SUP area essentially stop where the TSI projects begin. The reader is referred to the following section titled "Projects and Alternatives Considered but Eliminated Throughout this NEPA Process" for more information on the Bear Valley TSI project.

### ***The Village Skiway***

In conjunction with the proposed Village Lift, and in order to provide a descent to Bear Valley Village from Koala Ridge that is appropriate for lower-level skiers/riders (including novices), BVM proposes to put increased emphasis on *The Village Skiway*. This existing intermediate trail currently follows a portion of the Koala Access Road that extends from the VMF and Bear Valley Village. *The Village Skiway* currently parallels the eastern ski area boundary and extends from the run-out of Sunrise Bowl (capturing skiers/riders from higher-up expert trails such as *East Ridge*, *Sunrise*, *Schimke's*, *Sea of Holes* and *School House Ridge*) to Bear Valley Village. By using a combination of new trail construction, and widening/grading along the Koala Access Road, a novice descent to Bear Valley Village can be achieved on *The Village Skiway*.

Between Koala Top and the on-mountain VMF, the Koala Access road is proposed to be widened to about 30 feet (the existing road corridor is roughly 15 feet wide). This widening project would accommodate grooming that would enable novice level skiers/riders to enter *The Village Skiway*. Below the VMF, about 1,500 feet of new trail construction are proposed to provide a novice grade that connects to the Koala Access Road (and the existing start of *The Village Skiway*). This would

require grading and tree removal. Because the Koala Access Road is overlapped by the Bear Valley TSI project, tree removal associated with widening its lower portions has already been analyzed, approved and partially implemented.

#### *Sunrise Bowl Terrain*

Under Alternative 2 (Proposed Action), no formal trails are proposed in Sunrise Bowl. BVM may remove hazard trees in Sunrise Bowl in the future; however, the Bowl would essentially remain in a natural state. Expert skiers/riders descending terrain in Sunrise Bowl (including trails such as *East Ridge*, *Sunrise*, *Schimke's*, *Sea of Holes* and *School House Ridge*) would be funneled into *The Village Skiway* to reach the bottom terminal of the proposed Village Lift.

#### *Home Run/Lunch Run*

Alternative 2 (Proposed Action) includes tree removal along specific sections of *Home Run* and *Lunch Run* that is proposed to improve skier/boarder access to Bear Valley Village. Below the intersection of *Home Run* and *Lunch Run*, an intermittent stream (i.e., dry most of the year, except for the spring run-off period) is proposed to be spanned. This would be accomplished by installing a half-culvert (about 96 inches in diameter and 40 feet long and able to support a snowcat). Spanning this drainage would eliminate the need for BVM to fill the deep, incised drainage with snow each season (which is time consuming and inconsistent), and would make this drainage crossing more consistent throughout the year for descending skiers and riders.

### **b. Parking**

#### **INCREASE PARKING CAPACITY BY 174 SPACES**

Alternative 2 (Proposed Action) would enlarge existing parking lots to accommodate skiers/snowboarders on peak days within the existing SUP area. BVM proposes to enlarge three existing parking areas by a total of 1.8 acres to accommodate 174 additional vehicles. Existing parallel parking spaces along the road would increase by widening the edge by 15 feet to accommodate angled parking in the Upper Road lot. Similarly, parallel parking in the vicinity of *Snoopy's Hangar* would be expanded to accommodate diagonal parking. The existing RV lot would be expanded to the east by about 0.8 acre to add additional spaces for vehicles. The proposed parking increases at BVM would result in a total parking capacity of 4,232 guests. With installation of the proposed Village Lift, most residents and guests of Bear Valley Village would ride the lift instead of driving personal vehicles or using shuttles, thereby reducing parking demand in the day skier lots at BVM.

### **c. Services**

#### **BEAR TOP LODGE**

Under Alternative 2 (Proposed Action), BVM would construct a 12,500-square foot facility at Bear Top—the Bear Top Lodge—as described in the 1995 Bear Valley FEIS/ROD. The proposed lodge would include about 10,000 square feet of space on the main floor, with a 2,500-square foot basement. The proposed lodge would provide food service, retail, and restrooms. The basement would provide storage areas and ski patrol facilities. Additionally, a 1,500-square foot deck would be constructed for outdoor seating. Once the proposed lodge is constructed, the existing restrooms on Bear Top would be decommissioned and removed from the site. The proposed Bear Top Lodge would tie into existing power and communication lines located near the top terminal of the Bear and Kuma chairs. In addition, a water/sewer line would be trenched in *Tuck's Traverse* and tie into existing utility lines buried within the Koala Access Road near the vehicle maintenance facility. The existing water/sewer line within the Koala Access Road extends about 8,000 feet to Bear Valley Village.

## Alternative 3 (Improved Skier Circulation)

Alternative 3 (Improved Skier Circulation) responds to the Recreation issue described in Chapter 1 (1.7 Issues): **Proposed lift upgrades and installations, combined with new and improved trails, have potential to increase densities on specific beginner, novice and intermediate terrain.** As such, this alternative addresses access between Koala Top and the base area as well as repeat use of terrain on the Village Side of the ski area. Alternative 3 is the same as Alternative 2 (Proposed Action) with the exceptions noted below (Figure 4, map package).

### **a. Circulation**

#### **RESORT CAPACITY**

Under Alternative 3 (Improved Skier Circulation), CCC would increase by 810 people, for a total CCC of 5,500.<sup>5</sup>

#### **LIFT NETWORK**

Alternative 3 (Improved Skier Circulation) includes two chairlifts identified as the Village Lift (the lower lift) and the Sunrise Bowl Lift (the upper lift) instead of a single lift between Bear Valley Village and Koala Ridge (as described in Alternative 2). Together, these two lifts are designed to provide lift service between BVM and Bear Valley Village. Independently, the Sunrise Bowl Lift is designed to accommodate round trip skiing use of the Sunrise Bowl area, without having to descend all the way to Bear Valley Village.

##### ***Village Lift***

Under Alternative 3 (Improved Skier Circulation), the high-speed, detachable Village Lift would have the same bottom terminal location (on private land) as in Alternative 2; however, instead of extending all the way to Koala Ridge, it would terminate at the bottom of Sunrise Bowl.<sup>6</sup> Its total length would be about 6,000 feet, with a vertical rise of about 550 feet. About 2,100 linear feet of the lift line would be on NFS land, while the remaining 3,900 linear feet would be on private land. The top terminal would be at an elevation of 7,640 feet. By constructing this lift as a detachable, it would accommodate guests who wish to download it rather than ski/ride to the Village.

About 0.5 acre of ground would be disturbed to construct each lift terminal. Construction of the top terminal would require the removal of all vegetation (primarily herbaceous and shrubs, with minimal tree removal) within the 0.5-acre disturbance area. The top terminal location is in an existing forest opening. Tree removal would be required along the lift corridor and at the top terminal location.

##### ***Sunrise Bowl Chairlift***

Under Alternative 3 (Improved Skier Circulation), the Sunrise Bowl Chairlift would extend from the top of the proposed Village Lift to Koala Ridge, just above *NASTAR*. This would be a fixed-grip lift, about 2,700 feet in length, with a vertical rise of about 630 feet. Construction of this terminal would require some fill material to be transported to the site to create an unload area. While some of the required material would be obtained from the proposed trail grading projects occurring at other locations on the mountain, BVM would likely need to import material from offsite.<sup>7</sup> If additional material is needed, BVM would obtain material from a Forest Service approved source. The Sunrise Bowl Chairlift bottom terminal would be located downslope of the proposed Village Lift top terminal at an elevation of about 7,630 feet.

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<sup>5</sup> In Alternative 3, the CCC is larger than Alternative 2 as attributable to the combined capacities of the proposed Village and Sunrise Bowl lifts.

<sup>6</sup> This is proposed as a detachable lift in order to accommodate downloading to Bear Valley Village.

<sup>7</sup> Fill material would be from a certified weed-free source.

**Proposed Super Cub Upgrade**

Under Alternative 3 (Improved Skier Circulation), *Super Cub* would be upgraded to a high-speed detachable quad (identical to Alternative 2). This alternative includes the same terrain re-contouring and vegetation removal between the top terminal of Super Cub and *Ego Alley*.

While use of the Cub chairlift would be scaled back with replacement of the Super Cub (as with Alternative 2), Alternative 3 includes a design feature that would trigger operation of the Cub chairlift when the resort experiences a visitation level of 500 (or more) guests (which is the visitation level at which its operation is currently triggered). This design feature is primarily intended to reduce pressure on beginner and novice terrain in Bunny Basin that is served by Super Cub and Cub (i.e., it would eliminate the need for beginner and novice skiers/riders to traverse west after unloading Super Cub in order to reach *Cub Meadow*). This would reduce the mixing of low-level skiers/riders with more advanced skiers/riders descending from *Groovy Gully*, which is a popular “thoroughfare” trail from the Bear Top.

**TERRAIN NETWORK**

Under Alternative 3 (Improved Skier Circulation), BVM would expand and improve its lift-served terrain network, primarily on the Village Side of the SUP area. Table 2-3 compares lift-served and non-lift-served terrain between Alternatives 1 and 3. Note: Table 2-3 does not distinguish among the ability level classifications for “undeveloped” terrain on the Village Side, as this undeveloped terrain ranges greatly between intermediate and expert; however, Village Side terrain that would become lift served is included in the Alternative 3 column.

Table 2-3: Terrain Breakdown – Alternative 3 Compared to Alternative 1

|                                             | Terrain Classification           | Alternative 1 Trail Area (acres) | Alternative 3 Trail Area (acres) |
|---------------------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Lift Served Terrain                         | Beginner                         | 1.6                              | 1.6                              |
|                                             | Novice                           | 28.9                             | 50.1                             |
|                                             | Low Intermediate                 | 58.7                             | 59.5                             |
|                                             | Intermediate                     | 73.9                             | 109.5                            |
|                                             | Adv. Intermediate                | 65.1                             | 85.1                             |
|                                             | Expert                           | 238.3                            | 246.3                            |
|                                             | <b>Total Lift-Served Terrain</b> | <b>466.5</b>                     | <b>552.0</b>                     |
| <b>Non-Lift-Served (Village Side) Total</b> |                                  | <b>500</b>                       | <b>417.7</b>                     |

Under Alternative 3 (Improved Skier Circulation), improvements to *Mokelumne West Bypass*, *The Village Skiway* and *Home Run/Lunch Run* would be the same as Alternative 2. Lift-served terrain increases in all classifications, with the exception of beginner. This is attributable to the addition of the *Mokelumne West Bypass* and widening/recontouring of *Bono’s Alley* and *Water Tank* on the Front Side. On the Village Side, the roughly 83-acre increase in lift-served terrain is owed to the installation of the Sunrise Bowl Chairlift, which would make terrain in Sunrise Bowl (which feeds directly into *The Village Skiway*) directly lift-served (this is not true for Alternative 2).

**Front Side/Back Side/Lower Mountain Terrain**

*Bono’s Alley*

Under Alternative 3 (Improved Skier Circulation), the top terminal of the proposed Sunrise Bowl Lift would be moved further west along Koala Ridge as compared to the top terminal of the Village Lift in

Alternative 2. This would provide numerous options for descending to the base area for off-loading skiers and riders who are coming from Bear Valley Village. Due to this top terminal location (and the fact that it would be a fixed-grip lift with a lower hourly capacity), it is assumed that *Bono's Alley* would not receive as much skier/ride traffic as under the Proposed Action; however, low-level skiers and riders would be expected to use *Bono's*, as this would be their only option. Therefore, in Alternative 3, proposed re-contouring/widening on *Bono's Alley* and *Water Tank* would be substantially reduced compared to the Proposed Action.

### ***Village Side Terrain***

Under Alternative 3 (Improved Skier Circulation), the proposed Sunrise Bowl and Village chairlifts are designed to provide a link between Bear Valley Village and the ski area, while accommodating direct, round-trip use of terrain in Sunrise Bowl.

As with Alternative 2, mountain planners identified terrain on the Village Side that would become directly versus “technically” lift-served under Alternative 3. Technically, all terrain on the Village Side of the ski area would become “lift-served” under Alternative 3, the distinction being that not much of it would be *easily* or *directly* lift-served.

Terrain in Sunrise Bowl (which includes named trails, including *East Ridge*, *Sunrise*, *Schimke's*, *Sea of Holes* and *School House Ridge*) would become directly lift-served with the Sunrise Bowl Lift. Furthermore, *The Village Skiway* would funnel skiers and riders down to Bear Valley Village and the proposed Village Lift bottom terminal. As previously discussed, this accounts for the roughly 83-acre increase in lift-served terrain on the Village Side.

The remaining terrain in the Village Side—roughly 418 acres—would, from a practical perspective, remain undeveloped and non-lift-served. Again, this is attributable to the difficulty in reaching the bottom terminal of the proposed Village Lift from terrain within Dardanelles Vista Bowl and further west to *Lunch Run*. This terrain terminates at Bear Valley Road and Creekside Drive, and the run-out requires negotiating roads and flat sections that encumber easy, straight-forward access to the bottom terminal, which is critical to the designation of “lift-served” terrain.

### ***Sunrise Bowl Terrain***

Under Alternative 3 (Improved Skier Circulation), the terrain in Sunrise Bowl would remain largely as-is, classified as expert with open runs and glades. However, in this alternative BVM would groom two routes, on the eastern and western sides of the Bowl, to accommodate intermediate skiers/snowboarders who wish to repeat ski/ride the bowl via the proposed Sunrise Bowl Lift. Vegetation removal (roughly 3.6 acres) would be necessary in the lower elevations of Sunrise Bowl to help capture/funnel descending skiers/riders back to the bottom terminal of the proposed Sunrise Bowl Lift. About 75 acres of Sunrise Bowl would become lift served. As proposed in this alternative, the two intermediate groomed trails on the eastern and western sides of Sunrise Bowl would account for just less than 17 acres of terrain.

### **b. Parking**

Increases to BVM's parking capacity would be the same as Alternative 2.

### **c. Services**

The proposed Bear Top Lodge would be the same as Alternative 2.

## **2.2 MANAGEMENT AND OTHER REQUIREMENTS COMMON TO ALL ACTION ALTERNATIVES**

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Management and other requirements are provided as a means to minimize the extent of the effects associated with implementation of the Action Alternatives. Appropriate management requirements are listed for each resource area. When the effects of the management requirements are applied, the results are expected to limit the degree and magnitude of adverse effects associated with the action. They are also expected to rectify impacts through repairing, rehabilitating, or restoring the affected environment and to reduce or eliminate impacts over time by preservation and maintenance operations during the lifetime of the action.

In addition to the management requirements prescribed below for each resource area, BVM would be required to obtain all necessary County permits and submit, for Forest Service approval: project construction and grading plans; and, Erosion and Sediment Control plans for all ground disturbing activities. These plans would incorporate management requirements discussed below. Annual Summer Operating Plans would include strategies for monitoring compliance with, and the effectiveness of, required management requirements. Compliance with management requirements is stipulated in the SUP.

BVM will continue to implement its Environmental Management Plan, which addresses on-going resort impacts related to energy use/efficiency, carbon footprint, and recycling. The Environmental Management Plan is included in Appendix A of this document.

The following management requirements apply to all Action Alternatives to reduce or offset resource impacts.

### **Management Requirements**

#### ***Air Quality***

- To the extent feasible, site improvements would be installed promptly in order to reduce the potential for dust emissions.
- Grading areas, including lift terminal areas, would be watered as necessary and practical to prevent excessive amounts of dust. In the absence of natural precipitation, watering of these areas would occur as needed from approved water sources.
- Erosion control and revegetation efforts would commence immediately following construction as per Forest Service BMPs and an approved Erosion Control Plan (as required per the SUP).
- BVM prepared an Environmental Management Plan (Appendix A) to address air quality and greenhouse gases, and discuss ways to improve operational procedures to reduce emissions at BVM. Examples include the conversion of snowmobiles from 2-stroke to 4-stroke engines, and the possible use of natural gas for the shuttle buses. The Forest Service and BVM would coordinate the implementation of this plan.

#### ***Cultural Resources***

- If any previously unidentified cultural resources are identified or encountered at any time during construction activities, the Forest Archaeologist shall be notified and the resources protected until the Forest Service fulfills its consultation requirements.

#### ***Geology and Soils***

- Erosion and sediment control measures contained within the BVM Annual Operating Plan (the most recent) would be included in all constructions plans to minimize soil erosion.

- For project activities that involve grading, existing topsoil would be stripped off the surface and temporarily stockpiled onsite for use in site stabilization in approved locations. Following the completion of grading activities, topsoil would be redistributed over the project area and stabilized with seed and mulch to provide permanent vegetation cover. The two areas of concern are the *Mokelumne West Bypass* and the *Bono's Alley/Water Tank*. The quantity of topsoil is limited in both area, but the Water Tank Run would likely be deficit within the limits of grading. Construction of the proposed parking lots would create a large volume of topsoil surplus. This surplus will be used to mitigate the deficit expected on the Water Tank Run. The final grading plan would provide specifications on management of topsoil and would provide guidance to redistribute estimated volumes of topsoil materials over a final grade. The Forest Service would review and approve the plan. The plan would include the following:
  - An estimate of the existing topsoil resource with the limits of grading. Method or guidance to maximize the volume of topsoil to be stripped, stockpiled, and redistributed to a finished grade. Coordinate specifications on management of topsoil with soil scientist.
  - Topsoil and fill materials would be stored in separate piles. Topsoil would not be mixed with fill or used as fill. Topsoil would not be buried. Topsoil would be used as a dressing treatment over the final grade.
  - Most topsoil piles would be utilized in the year they are created. Piles that winter over would be mulched with weed free straw or wood straw.
  - Appropriate methods of stabilizing loose fill slopes would be specified in the plan. This may include compaction of fill layers, keying in the topsoil layer on steep side slopes, and control of runoff onto the fill and other graded surfaces. Fill slopes along *Bono's Alley* are presently stable and have successfully re-vegetated. Planned grading and widening would require stabilizing new slopes.
  - Any imported material will be of an acceptable quality and free of noxious weeds.
- Logging on steep (>35%) slopes would require treatments that avoid excessive soil displacement, i.e., logging over snow, FMC type skidders, helicopter, or other methods approved by the Forest Service.
- Equipment will use existing roads and trails to the extent possible to access construction sites. Equipment would not be allowed to cross streams or wetlands. At the proposed stream crossing on Lunch Run, equipment would not be allowed to operate in the riparian zone.
- Establishing long-term native vegetative cover for erosion control on bare slopes is a priority at BVM. Project areas will be reviewed in the field on an annual basis and supplemented with additional seeding or fertilization as necessary to establish cover. Plant species would be appropriate to the ecological site and elevation zone. The Forest Service would review and approve the plan.
- The preliminary review of the Mokelumne Bypass trail completed by Condor Earth Technologies indicated that trail construction could be completed through excavation and engineered backfill keyed into the native materials. Toe-slopes may need additional stabilization using gabion walls, but further geotechnical review of the project site is warranted prior to construction.
- Construction sites would have a compacted footprint from repeated equipment traffic. Some of this compacted zone would be used for future access by equipment or vehicles and would remain compacted. Areas that are not required for access or facilities would be subsoiled if compacted. Winged shanks designed for subsoiling would be used. Coordination with the soil scientist would occur on the specifics of the subsoiling treatment.
- Replacement of the Super Cub chairlift is not expected to result in impacts to the Cub Meadow wetland. If further engineering warrants the placement of a tower in the wetland, BVM will

consult with the USFS and the Army Corps of Engineers to determine the necessary steps to minimize wetland impacts during tower construction. These measures will include, but not be limited to; minimizing equipment access and duration in the wetland, temporarily stockpiling wetland soils for use in stabilization, erosion control BMPs to minimize soil movement, and removal of old towers (when not be re-used) as mitigation for new impacts.

- For all proposed grading activities, topsoil will be stripped off the trail and temporarily stockpiled in an approved location. After grading is completed, top soils will be redistributed over exposed soils as a dressing, and stabilized with an approved seed mixture.
- Construction activities in Cub Meadow would be conducted over snow by a tracked excavator.

### **Recreation**

- The *Village Skiway* would have proper signage to improve funneling skiers/snowboarders into town by means of approved trails, therefore reducing/eliminating trespassing through private properties. Additionally, signs would be posted on proposed beginner level egress trails between Bear Top and the main base area to warn skiers of merging zones where egress trails cross existing, higher level trails.

### **Vegetation**

- Where practical, all merchantable trees cut and removed in the previously described actions would be disposed of in a manner consistent with a timber settlement agreement between BVM and the Forest Service. Non-merchantable tree would be cut and left onsite in accordance with the fuels treatment plan. Where slash exceeds recommended levels, cut trees may be piled, burned, chipped, or other acceptable method of disposal onsite.
- A revegetation plan would be developed for the area between the proposed Mokelumne West Bypass and the existing Mokelumne West trail in conjunction with grading plans to address the loss of forested vegetation.
- Where possible thinning of forest vegetation for new trails would be designed to promote forest health by selecting diseased or dying trees and to perpetuate mature forest conditions.
- Where possible, snags would be retained in non-treated areas unless they pose a direct hazard to guests or infrastructure (e.g., chairlifts or buildings). Cut trees would be scattered in adjacent, untreated areas where fire fuel levels are low to provide habitat structure as large woody material.
- All tree stumps left in the ground would be flush cut (where possible) and treated with Sporax to minimize the spread of disease.

### **Visual Resources**

- Choose facility and structure design, scale, color of materials, location, and orientation to meet the scenic integrity level of the project area.
- Follow FSM guidelines (Section 2380):
  - The scenic character would be protected through appropriate siting of buildings and the use of low-impact materials and colors (e.g., indigenous construction materials, such as stone and wood, as well as low-reflective glass and roofing materials)
  - Remain in context with the landscape (i.e., rustic, craftsman, and country lodge styles).
- Bear Top Lodge would be sited to minimize its visual presence on the landscape from Bear Valley Village. The lodge would include architectural design measures to minimize visual impacts. The lodge would be consistent with the Forest Service's Built Environment Image Guide.

## **Watershed Resources**

- Include both structural and operational erosion control measures, avoidance of wetlands and riparian areas, and shall include both tree cutting and/or removal and other ground-disturbing activities (i.e., utilities trenching and installation). After October 15th, all erosion control measures should be winterized.
- Where grading is proposed, all top soils should be stripped and temporarily stockpiled on site. Stockpiled soils should be stabilized with appropriate erosion control measures during construction activities. Following completion of construction, stockpiled soils should be redistributed over exposed soils and seeded to aid in the reestablishment of vegetation.
- Water Quality Management for Forest System Lands in California. Best Management Practices. Pacific Southwest Region. Vallejo, CA. (USDA 2000)
  - 1-8-Streamside Zone Designation – Where project activities occur near riparian area, flagging or construction fencing would be established at the ordinary high water mark. No equipment would be allowed to operate or cross the exclusion zone.
  - 1-10-Tractor Skidding Design – Preference would be given for over-the-snow tree removal to reduce impacts to the ground.
  - 1-18-Meadow Protection During Timber Harvesting – No equipment would be allowed to operate in meadows, unless no other option is available. The forest hydrologist would be consulted prior to any operation in meadows to develop appropriate mitigations for any impacts.
  - 1-19-Streamcourse and Aquatic Protection – Same as item 1-8 above.
  - 4-9-Protection of Water Quality within Developed and Dispersed Recreation Sites – Erosion and sediment control measures would be in place and periodically checked during construction activities to minimize sediment delivery to aquatic area. A spill kit would be kept on hand at all project sites in the event of a spill or leak from construction equipment.
  - 5-3-Tractor Operation Limitation in Wetlands and Meadows – Same as item 1-18 above.
  - 5-4-Revegetation of Surface Disturbed Areas – Following the completion of trail grading activities, exposed soils would be dressed with stockpiled top soils and seed to promote the establishment of vegetation.
  - 5-6-Soil Moisture Limitations for Mechanical Equipment Operations – Ground disturbing activities would occur during dry weather to minimize the potential for sedimentation to nearby water bodies, e.g., streams and wetlands.
  - 7-3-Protection of Wetlands – Prior to construction, proposed project limits would be flagged in the field and routed around wetlands to the greatest extent possible. If unavoidable impacts are encountered, the Forest Hydrologist would be consulted to determine appropriate mitigations.
  - 7-5-Control of Activities Under Special Use Permit – All proposed projects would comply with applicable water quality laws and regulations.
  - Avoid placement of lift tower footings in wetlands along the proposed Super Cub chair alignment. If this is not technically feasible based upon final engineering design, a Forest Service hydrologist would be consulted to determine appropriate methods of constructing the tower in the wetland.
  - Avoid the small wetland (about 200 by 75 feet) on the right bank of the small intermittent stream near the Koala parking lot by terminating the grading/filling operation at the wetland's eastern end.
  - Bridge construction across the small perennial stream at about 7,500 feet elevation would (1) not remove obligate riparian vegetation such as alders and willows, (2) limit abutment and associated ground disturbance in the Riparian Conservation Area to less than 0.1 acre, and (3) provide mulch on disturbed areas.

## **Wildlife**

- The following Limited Operating Periods for noise disturbance activities such as operation of heavy machinery or the operation of chainsaws will be in effect for the following species, unless otherwise authorized in writing by the Forest Service:
  - Northern goshawk – February 15 to September 15, (if implemented after May 31, 2013)
  - California spotted owl – March 1 to August 15, (if implemented after May 31, 2013)
  - Fisher – March 1 to June 30, (if implemented after May 31, 2013)
  - American marten – May 1 to July 31
  - Mule deer – no ground disturbance will occur prior to July 15 to accommodate fawning.
- Concrete would be poured by a long-arm concrete truck or by helicopter to reduce potential impacts to Yosemite toad habitat.

## **Other Requirements**

Assumptions on the amount of clearing and/or grading that would occur for specific activities proposed in the Action Alternatives are shown in Table 2-5. For analysis purposes, clearing and grading extents should be considered worst-case; actual clearing would not exceed this stated limit.

### **Clearing Requirements**

The project limits would be flagged in the field based on GIS data. Trees within the project limits would be cut flush to the ground where practical and stumps would not be removed. The ground surface would not be graded and the natural ground cover would be maintained. Shrubs may be cut down to reduce the height above snow where they may concerns safety concerns for skiers/snowboarders. The method of tree removal would be determined on a case-by-case basis and may include a combination of the following: removal by lop and scatter; skidders [yarding over snow]; piling/burning; chipping and/or helicopter.

### **Grading Requirements**

The project limits would be flagged in the field based on Geographic Information Systems (GIS) data. Grading would occur at all locations where structures are proposed (e.g., lift towers, buildings) and along key trails where necessary to create low level slopes. Grading may include the use of explosives for the removal of bedrock or large boulders, or the use of heavy equipment (e.g., excavators, bulldozers, etc.) for earthmoving. Cut/fill material would be retained onsite to balance volume requirements to the extent possible. Additional materials would be obtained from Forest Service approved sites. Similarly, excess materials would be disposed offsite in Forest Service approved locations.

## 2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

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The following projects and alternatives were considered but eliminated from further study in this EA. This list also includes projects that were originally included on the STF's Schedule of Proposed Actions (SOPA) and/or scoping, but have since been removed for the reasons stated.

### **a. Removal of the Fingers Corridors**

Historically, four trails—*Home Run*, *Lunch Run*, *Applebonkers*, and *Schoolhouse Ridge*—provided return routes to Bear Valley Village; however, this has now increased to about 16 trails (the existing condition). In the past, concerns were raised by residents that ski area guests returning to town were trespassing on private property; there were no clear delineations where the general public could enter Areas in Common to access County roads in Bear Valley Village.

The “Fingers Corridors” project was originally included in the Proposed Action as a way to create a terrain link from BVM to Bear Valley Village. As originally conceived, the Fingers Corridors would have included signs and selective tree removal to funnel skiers/snowboarders to the designated Areas in Common in order to address concerns about trespass. (This would require the removal of about 45 trees per acre to create each trail. In total, about 30.8 acres would have been treated to implement this project.)

Meanwhile, in the forested stand surrounding the “Fingers Corridors” area within BVM SUP area, the high stocking levels and advanced age of the overstory trees were contributing to increased tree stress due to inter-tree competition for moisture and nutrients. This resulted in conditions that increased tree susceptibility to insect infestation, pathogens, and other damaging agents. The overall decline of the red fir overstory resulted in the mortality of the largest trees on the landscape. Therefore, in 2010 the Forest Service designed a Timber Stand Improvement (TSI) project to address forest health throughout the stand (including the Fingers area). The “Bear Valley TSI” project also addressed skier/boarder access and safety between BVM and Bear Valley Village. The Bear Valley TSI project area encompassed 248 acres, of which 242 acres were within the BVM Special Use Permit area, and overlaps the areas originally proposed as the Fingers Corridors. A Decision Memo for the Bear Valley TSI was signed by Calaveras District Ranger Teresa McClung in September 2010 that authorized thinning 208 acres of red fir/mixed conifer forest along the northern boundaries of Bear Valley Village. This approved project has already been partially implemented as of the publication of this EA. In addition, an easement has now been established which addressed issues concerning trespass.

Due to the rationale stated here, the “Fingers Corridors” project was removed from further consideration in this EA and is only addressed cumulatively.<sup>8</sup>

### **b. Lower Home Run/Lunch Run and Showshoe Traverse**

After reviewing the Forest Health and Silvicultural report, and consulting with Forest Service specialists, on the lower *Lunch Run/Home Run* and *Showshoe Traverse* projects from the BVM Expansion proposal, the Forest Supervisor removed the forest thinning of the “Fingers Corridors” and the selective tree projects from all action alternatives. While the proposed treatment focused on removing small conifers to funnel skiers towards approved common areas, in order to better transition the red fir stand towards a desired condition, a silvicultural prescription for the entire stand is needed.

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<sup>8</sup> The Bear Valley TSI project is discussed in a Connected Actions Determination memorandum that was prepared in conjunction with this EA. The Connected Actions Determination memorandum is contained in the project file.

It was determined that that type of prescription is outside of the purpose and need for the BVM Expansion project.

**c. Spring Gap Grading**

This project was originally included in the Scoping Notice released to the public on August 2, 2008 as an option for providing novice and low-intermediate egress from Bear Top to the Base Lodge. The existing *Spring Gap* trail traverses *Porridge Bowl* and *Groovy Gully*—both of which are expert trails. Regrading *Spring Gap* to accommodate lower ability skiers/snowboarders would require widening a bench through *Groovy Gully* that would have disrupted the flow of the terrain used by higher ability skiers. Additional concerns were raised related to mixing of ability levels and visual impacts. After consideration of construction methods, the project footprint (environmental impacts would have been extremely difficult to mitigate, including soils, slope stability, visibility and tree removal), and potential skier/boarder conflicts, it was determined that this project would not meet the Purpose and Need. Therefore, it was not carried forward into the analysis.

**d. The East Bowl Beginner Pod**

The East Bowl Beginner Pod (also known as Sunrise Bowl) was approved in a Record of Decision on Bear Valley’s 1995 EIS. Construction of the Sunrise Bowl Beginner Pod would have required a significant financial investment as well as additional environmental analysis (i.e., 1995 EIS was programmatic in scope). In order to construct this as a viable beginner pod, BVM would have to install a half-mile long road, pave it, and add several acres of parking. Transportation (shuttles) to and from the pod would be necessary, as would guest service facilities.

**e. Formalize Schoolhouse Ridge and Applebonkers**

The formalization of *Schoolhouse Ridge* and *Applebonkers* (two trails that have existed for quite some time allowing guests to descend the Village Side all the way to Bear Valley Village) was a component of the Proposed Action that was included in the scoping notice for this project. However, between the scoping notice and the release of this EA, *Schoolhouse Ridge* and *Applebonkers* were incorporated into BVM’s trail network and they were therefore removed from the proposal. Formalizing the management of these existing trails was an administrative action under the BVM SUP and was handled under the ski area’s annual operating plan.

**f. Improvements to Mokelumne West**

Prior to scoping several options were considered to design an egress from Bear Top to the base area for low ability level skiers/snowboarders using the existing *Mokelumne West* trail. These options included a combination of trail widening, changing alignments and regrading to create appropriate slopes for low ability level skiers/snowboarders. However, the *Mokelumne West* trail is widened to the extent possible, therefore this was not considered to be an option for meeting the need to get lower level skiers/boards down from Bear Top.

**g. Reduced Expansion Alternative**

The suggested “Reduced Expansion Alternative” was based on public comments received during the scoping process. This suggested alternative would reduce visitor increases to 20,000 for the next 5 to 10 years. This alternative was eliminated from detailed study because the proposed action only allows for an increase of 383 skier capacity. With about 30 peak ski days, the increase of additional skiers is likely to be less than 11,500 people annually. The proposed action is considered to be the minimal action needed to meet the current needs and does not increase visitor use above the 1995 Record of Decision of 4,400 skiers/snowboarders-at-one-time.

#### ***h. Portions of the Suggested Modified Current Use Alternative***

In response to this suggested alternative from the public, indicators that address potential impacts to wildlife habitat, soils and watershed, and recreation are included in this EA. However, the full concept for a “Modified Current Use” alternative was not carried forward into the analysis.

This suggested alternative concept included construction of the *Village Lift* and skiway (AKA “The *Village Skiway*”), trail improvements on existing terrain (including *Bono's Alley/Water Tank*, *Spring Gap* trail, *Home Run* and *Lunch Run*, and the skier/boarder bridge [culvert]), *Super Cub* upgrade, and parking lot expansion as described in the Proposed Action. However, Bear Top Lodge (and associated utilities) and the *Mokelumne West* bypass were not included in this proposed alternative.<sup>9</sup>

This suggested alternative concept would only meet parts of the stated purpose and need. Specifically, it was determined that the “Modified Current Use” alternative concept would not address the need to improve skier/boarder services because it does not include additional guest service facilities. In addition, by excluding improvements to the *Mokelumne West* trail, this alternative concept would not address the need to improve skier/boarder circulation within the existing ski area.

Skiers/snowboarders of lower abilities would continue to be required to negotiate terrain beyond their ability level to access the base area from top of Bear Top.

Furthermore, this alternative was not carried into the EA for detailed analysis for the following reasons:

- Scaling back the overall amount of thinning in the funnel portion of the fingers and improvements to *Home Run/Lunch Run* and *Snowshoe Traverse* was implemented under the Bear Valley Timber Stand Improvement project.
- An alternative that reduced the amount of grading of *Bono's Alley* is analyzed in the EA (Alternative 3).
- The Mountain Top Lodge would be built incorporating applicable standards suggested by the US Green Building Council (USGBC). The no-action alternative analyzes the exclusion of the Mountain Top Lodge.
- The No Action alternative analyzes eliminating any re-grading or widening of the *Mokelumne West Trail*.

#### ***i. Portions of the Suggested Resource Enhancement Alternative***

In response to this suggested alternative from the public, indicators that address potential impacts to wildlife habitat, soils and watershed, and recreation are included in this EA. However, the full concept for a “Resource Enhancement” alternative was not carried forward into the analysis.

This concept was suggested to minimize the loss of late seral stage closed canopy habitat that presently benefits American marten, some bird species, fisher, wolverine, Sierra Nevada red fox, and other sensitive species. American marten are present, as are some bird species, but none of the other species are present. To reduce fragmentation or opening up of older forest habitat, some ski runs would not be widened as proposed; large, older trees would be avoided to the fullest extent feasible in all project designs and actions; and strategic patches or connecting strips of habitat would not be fragmented except where necessary. Impacts to watershed and water quality would be further reduced from the suggested “Modified Current Use” alternative concept by diminishing even further the amount of grading and tree removal.

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<sup>9</sup> Although this alternative did include Spring Gap egress, Spring Gap was found to be environmentally unacceptable (refer to the previous discussion related to Spring Gap).

In this suggested alternative concept, the public urged that the *Mokelumne West trail* and the Bear Top Lodge be eliminated from the project for at least a ten-year period:

Based on the following rationale, this alternative was not analyzed in detail in the EA:

- Spring Gap was eliminated from all action alternatives due to the potential for considerable environmental impacts and safety concerns.
- Scaling back the overall amount of thinning in the funnel portion of The Fingers and improvements to *Home Run/Lunch Run* and *Snowshoe Traverse* was implemented under the Bear Valley TSI project, which also addressed the amount of trespass on private lands.
- Forest health and skier safety considerations were included in the design of the Bear Valley TSI project.
- There is no thinning planned for the East Bowl
- Alternative 3 reduces the amount of proposed grading of *Bono’s Alley*.
- The Mountain Top Lodge incorporates applicable standards suggested by the US Green Building Council (USGBC). The No Action alternative analyzes the exclusion of the Mountain Top Lodge.
- The No Action Alternative addresses no re-grading or widening on the *Mokelumne West Trail*.

## 2.4 COMPARISON OF ALTERNATIVES

Table 2-4 shows the grading and clearing resulting from the two action alternatives. Table 2-5 provides a summary of the key elements of the Alternatives. Table 2-6 summarizes the environmental consequences associated with each alternative, according to the relevant issues and analytical indicators identified in Chapter 1. Chapter 3 contains detailed discussions of potential effects resulting from implementation of the alternatives, including cumulative effects.

Table 2-4: Project Specific Clearing and Grading (in acres)

| Project Component                                       | Alternative 2 |              | Alternative 3 |              |
|---------------------------------------------------------|---------------|--------------|---------------|--------------|
|                                                         | Grading       | Clearing     | Grading       | Clearing     |
| Parking Lots                                            | 1.8           | N/A          | 1.8           | N/A          |
| Village Lift                                            | 0.9           | 11.0         | 0.5           | 8.3          |
| Sunrise Bowl Lift                                       | N/A           | N/A          | 1.0           | N/A          |
| Super Cub Replacement/<br><i>Ego Alley</i> Recontouring | 1.0           | N/A          | 1.0           | N/A          |
| <i>Mokelumne West Bypass</i>                            | 2.19          | 4.33         | 2.19          | 4.33         |
| <i>Bono’s Alley/Water Tank</i>                          | 3.64          | N/A          | 3.31          | N/A          |
| <i>The Village Skiway</i> (Upper)                       | 1.0           | 1.0          | 1.0           | 1.0          |
| <i>Home Run/Lunch Run</i>                               | N/A           | 3.8          | N/A           | 3.8          |
| Sunrise Bowl Improvements                               | N/A           | N/A          | N/A           | 3.8          |
| Bear Top Lodge                                          | 0.75          | N/A          | 0.75          | N/A          |
| Water/Sewer Line                                        | 4.3           | N/A          | 4.3           | N/A          |
| <b>Total</b>                                            | <b>15.58</b>  | <b>20.13</b> | <b>15.92</b>  | <b>21.23</b> |

Table 2-5: Comparison of Key Elements of Each Alternative

| Element                                        | Alternative 1 | Alternative 2 | Alternative 3 |
|------------------------------------------------|---------------|---------------|---------------|
| <b>Resort Capacity</b>                         |               |               |               |
| Comfortable Carrying Capacity                  | 4,690         | 5,140         | 5,500         |
| <b>Terrain Network</b>                         |               |               |               |
| Number of Trails                               | 96            | 100           | 103           |
| Acres of Developed Trails                      | 466.5         | 477.4         | 552           |
| Acres of Undeveloped Terrain                   | 500           | 492.3         | 417.7         |
| Increase to Direct Lift-Served Terrain – Acres | 0             | 10.9          | 85.5          |
| <b>Lift-Served Terrain Breakdown (acreage)</b> |               |               |               |
| Beginner                                       | 1.6           | 1.6           | 1.6           |
| Novice                                         | 28.9          | 50.1          | 50.1          |
| Low Intermediate                               | 58.7          | 52.3          | 59.5          |
| Intermediate                                   | 73.9          | 70.1          | 109.5         |
| Advanced Intermediate                          | 65.1          | 65.1          | 85.1          |
| Expert                                         | 238.3         | 238.3         | 246.3         |
| <b>Lift Network</b>                            |               |               |               |
| Number of Chairlifts                           | 9             | 10            | 11            |
| <b>Guest Service Facilities</b>                |               |               |               |
| Number of Facilities (i.e., lodges)            | 1             | 2             | 2             |
| Restaurant Seats                               | 675           | 945           | 945           |
| <b>Parking</b>                                 |               |               |               |
| Parking Lot Acreage                            | 15.1          | 16.9          | 16.9          |
| Total Vehicle Capacity                         | 1,750         | 1,924         | 1,924         |

Table 2-6: Summary Comparison of Environmental Consequences by Issue

| Issue/Indicators                                                | Alternative 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Alternative 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Alternative 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Wildlife Habitat</b>                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Acreage of habitat potentially affected, by species             | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>A complete discussion of impacts to species-specific habitat needs can be found in the BAE.</p> <p>Annual Grassland: 0.2 acre<br/>                     Barren: 3.6 acres<br/>                     Jeffrey Pine: 0.5 acre<br/>                     Lodgepole Pine: 1.3 acres<br/>                     Montane Chaparral: 3.1 acres<br/>                     Red Fir: 13.1 acres<br/>                     Urban: 0.1 acre<br/>                     Wet Meadow: 0.6 acre<br/>                     Total: 22.3</p> <p>A complete discussion of impacts to species-specific habitat needs can be found in the BAE. Impacts would occur as a result of the construction of the Mokelumne West Bypass. Removal of mature forest would reduce the amount of habitat available and potentially affect the quality of adjacent habitat by creating additional edge habitat. These actions could make some wildlife species (e.g., forest carnivores, raptors) more vulnerable to accidents, predation, or loss of fitness needed for survival and reproduction. Conversely, some wildlife species (e.g., deer, bats) would benefit from the creation of additional forest openings and edge habitat through increased foraging opportunities.</p> | <p>A complete discussion of impacts to species-specific habitat needs can be found in the BAE.</p> <p>Annual Grassland: 0.4 acre<br/>                     Barren: 5.7 acres<br/>                     Jeffrey Pine: 0.5 acre<br/>                     Lodgepole Pine: 1.9 acres<br/>                     Montane Chaparral: 10.5 acres<br/>                     Red Fir: 6.5 acres<br/>                     Urban: 0.1 acre<br/>                     Wet Meadow: 1.2 acre<br/>                     Total: 27.5</p> <p>Alternative 3 impacts to wildlife habitat would be the same as described under Alternative 2.</p> |
| Effects to Sensitive, MIS, T&E and Candidate species            | There are no federally listed Threatened or Endangered species potentially occurring within the project area. Refer to Tables 3-3 and 3-4 summaries of effects to Management Indicator Species and Sensitive Species                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>2. Soils and Watershed</b>                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Acreage of ground disturbance (trail grading)                   | 0 acres                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 15.6 acres                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 16 acres                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Acreage of new impervious surfaces/detrimental soil disturbance | 67.5 acres                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 97.6 acres                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 97.3 acres                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Modeled soil erosion                                            | 875 tons/year                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 892 tons/year                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 891 tons/year                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Equivalent Roaded Area (ERA)                                    | The results of the ERA analysis indicate a low risk of potential cumulative effects in all of the watersheds analyzed. The threshold of concern (TOC) is between 10 and 12% for the Mattley Creek watershed, and 12 to 14% for the Blood's Creek watershed. At the 7th field scale, both watersheds are well below the TOC, with 2.69% ERA and 3.96% in the Mattley and Blood's Creek watersheds respectively. At the sub 7th field scale, both watersheds are still below the TOC, although the existing ski area development (7.9%) is a major contributor to the higher ERA calculations in the Mattley Creek watershed (8.79% overall). |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

Table 2-6: Summary Comparison of Environmental Consequences by Issue

| Issue/Indicators                                      | Alternative 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Alternative 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Alternative 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>3. Recreation</b>                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Terrain distribution by ability level, by alternative | Beginner: 1.6 acres<br>Novice: 28.9 acres<br>Low Intermediate: 58.7 acres<br>Intermediate: 73.9 acres<br>Advanced Intermediate: 65.1 acres<br>Expert: 238.3 acres<br>Total: 466.5 acres<br><br>Non-Lift-Served: 500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Beginner: 1.6 acres<br>Novice: 50.1 acres<br>Low Intermediate: 52.3 acres<br>Intermediate: 70.1 acres<br>Advanced Intermediate: 65.1 acres<br>Expert: 238.3 acres<br>Total: 477.7 acres<br><br>Non-Lift-Served: 492                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Beginner: 1.6 acres<br>Novice: 50.1 acres<br>Low Intermediate: 59.5 acres<br>Intermediate: 109.5 acres<br>Advanced Intermediate: 85.1 acres<br>Expert: 246.3 acres<br>Total: 552 acres<br><br>Non-Lift-Served: 418                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Skier/boarder circulation by alternative              | <p>The quality of the recreational experience would continue to be limited by a deficit of beginner and low intermediate terrain. Lower level skiers/snowboarders descending to the base area from Bear Top on Mokelumne West and <i>Tuck's Traverse/Bono's Alley/Water Tank</i> would be required to negotiate terrain that is inappropriate for their ability/comfort level.</p> <p>There would continue to be a lack of a lift connection between Bear Valley Village and BVM, and therefore, "bus runs" would continue. Terrain on the Village Side of the ski area would continue to accommodate intermediate through expert skiers and riders—there would be no low-intermediate or novice route to Bear Valley Village.</p> | <p>Alternative 2 would add about 11 acres to BVM's lift-served terrain network (from 466.5 to 477.4). The quality of the recreational experience would continue to be limited by a deficit of beginner and low intermediate terrain.</p> <p>Skier/rider access to, and circulation throughout, BVM's Front Side/Back Side/Lower Mountain terrain is anticipated to remain as similar to the existing conditions. Exceptions include:</p> <p>By providing an alternate route around steeper sections of Mokelumne West, the proposed Mokelumne West Bypass would divert lower level skiers and riders away from Mokelumne West. This would eliminate the mixing of intermediate and novice level skiers and riders that currently affects circulation on this popular trail, improving the recreational experience.</p> <p>Technically, all of the terrain on the Village Side would become lift-served with installation of the proposed Village Lift. However, from a practical perspective, only <i>The Village Skiway</i> would become truly lift-served, as it is the only trail that directly leads to the bottom terminal of the proposed Village Lift. In reality, all terrain on the Village Side of the ski area is "lift-served"—the distinction being that not much of it would be easily or directly lift-served.</p> | <p>Under Alternative 3, lift-served terrain increases in all classifications, with the exception of beginner. On the Village Side, the roughly 83-acre increase in lift-served terrain is owed to the installation of the Sunrise Bowl Chairlift.</p> <p>The proposed Mokelumne West Bypass is identical between Alternatives 2 and 3.</p> <p>The installation of the Sunrise Bowl Lift and Village Lift under Alternative 3 would improve skier/boarder circulation while providing a lift and trail connection between BVM and Bear Valley Village. The two-lift configuration in Alternative 3 provides the benefit of lift service from Bear Valley Village with the ability to round-trip ski and ride Sunrise Bowl.</p> |



## 3. Environmental Consequences

### 3.1 INTRODUCTION

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This EA incorporates information on the affected environment and the environmental consequences contained in technical reports and other analyses prepared by the Forest Service and consultants. These reports are available for review as part of the project file maintained at the Calaveras Ranger District and are incorporated by reference:

- Forest Health Report
- Terrestrial Plant and Wildlife, and Aquatic Wildlife BAE
- Management Indicator Species Report
- Hydrology Report
- Soils Evaluation
- Cultural Resource Management Report
- Greenhouse Gas Emission Report
- Scenery Report

The Stanislaus National Forest (STF) manages all the lands within the project area. The Action Alternatives have been crafted to be consistent with Forestwide Standards and Guidelines, as well as to be consistent with management requirements specific to the Winter Sports Site forest plan allocation. With the exception of the lower half of the proposed Village Lift, all proposed projects would be implemented within BVM's existing SUP area. A review of Forest Plan standards and guidelines was completed in conjunction with this analysis. No inconsistencies in the Action Alternatives were identified, and all Action Alternatives are consistent with the Forest Plan.

This EA discloses project specific direct, indirect, and cumulative impacts that are projected to occur as a result of implementation of the Action Alternatives. It is important to note that the disclosure of impacts in this EA is meant to provide the maximum impact of each alternative, based on the project descriptions included in Chapter 2. The analysis also considers Management Requirements that would be implemented in order to avoid, minimize, reduce, rectify or compensate for impacts to the physical, biological or human environments (refer to Section 2.2). Potential cumulative effects, resulting from past, present, or reasonable foreseeable actions, are also identified.

#### **Information on Other Resource Issues**

In determining which issues and resources to analyze in detail within this EA, the STF utilized direction contained in Forest Service Handbook (FSH) 1909.15, Chapter 12.4. It was determined that the following resources would not require detailed analysis in the EA:

#### ***Bear Valley Village Development***

Subsequent to the 1995 Bear Valley FEIS and ROD, Bear Valley Village I, LLC and Bear Valley Village II, LLC, proposed a village master plan in Bear Valley Village based on the approved 1978 Master Plan for the town. This private land proposal (known as the "Bear Valley Village Development Proposal") includes residential and overnight lodging, restaurants, retail, skier/boarder services, parking, and related services within a portion of the Village.

Under California law (the California Environmental Quality Act [CEQA]), Alpine County analyzed the Bear Valley Village Development Proposal in an Environmental Impact Report (EIR).<sup>10</sup> The EIR addressed proposed projects in the Village (including the proposed Village Lift, because the bottom terminal is proposed on private lands). Alpine County completed and certified the EIR in July 2009. However, as of the release of this EA, project approval is pending based on new information regarding sewage treatment capacity and wastewater disposal. Supplemental environmental documentation under CEQA may be necessary.

The August 2008 Proposed Action scoping notice indicated that “the proposed Bear Valley Village I and II LLCs’ developments within the Town of Bear Valley are connected actions to the above-described Proposed Action.” However, since that time, the STF re-examined and modified its position on this issue. While the Proposed Action analyzed in this EA and the Bear Valley Village Development Proposal may be mutually beneficial, individual projects are not dependent on each other, or on any outside action for their individual justification. Individual projects are separated by jurisdiction and justification. Based on review of Council on Environmental Quality (CEQ) regulations (40 CFR 1508.25) the STF determined that none of the individual or collective components of the Proposed Action and the Bear Valley Village Development Proposal meet the definition of connected actions, which are defined as those that:

1. Automatically trigger other actions which may require environmental impacts statements.
2. Cannot or will not proceed unless other actions are taken previously or simultaneously.
3. Are independent parts of a larger action and are dependent on the larger action for their justification.

Therefore, in a regulatory sense, these projects are not connected and, as a result, the Bear Valley Village Development proposal is considered in a cumulative context in this analysis for the ski area expansion. This is discussed in greater detail in a Connected Actions Determination memorandum prepared in conjunction with this EA (project file).

### **Greenhouse Gas Emissions**

Greenhouse gas (GHG) emissions were considered in proportion to the nature and scope of the Proposed Action including the potential to either affect emissions or be affected by climate change impacts. There may be increases in GHG emissions from additional vehicular traffic, project construction/implementation, grooming, and operation of the Bear Top Lodge. This could increase GHG emissions in the vicinity of the ski area.

However, taken individually, these components of the Proposed Action are of such a minor scale in the context of global climate change that the quantification or qualification of direct, indirect, or cumulative effects would be meaningless to a reasoned choice among alternatives. A detailed analysis of GHG emissions was completed in conjunction with this EA, and is contained in Appendix B.

Also, it is not possible to discern significant effects on climate change as a result of implementing the Proposed Action. This is due to the facts: (1) The Proposed Action affects only a small area of National Forest System lands; and (2) as a result of the limited size and scope of the project, the effects of the Proposed Action cannot be meaningfully evaluated under current science, modeling, and policies.

Current guidance for addressing climate change in NEPA documents is provided below.

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<sup>10</sup> Alpine County 2008

## **WASHINGTON OFFICE AND CEQ GUIDANCE ON ADDRESSING CLIMATE CHANGE IN NEPA**

In January 2009, the Forest Service's Washington Office released a document titled "Climate Change Considerations in Project Level NEPA Analysis" (USDA 2009). That document provides initial Forest Service guidance on how to consider climate change in project-level NEPA analysis and documentation, and it was therefore considered in relation to this EA. Additionally, in February 2010, the CEQ provided a draft guidance memorandum for public consideration and comment on the ways in which Federal agencies can improve their consideration of the effects of GHG emissions and climate change in their evaluation of proposals for Federal actions under NEPA. The CEQ document is titled "Draft NEPA Guidance on Consideration of the Effects on Climate Change and Greenhouse Gas Emissions (CEQ 2010).

The 2009 Washington Office document acknowledges that "some proposals will not have cause-effect relationships to GHG or the carbon cycle, or are at such minor scale that direct effects would be meaningless to a reasoned choice among alternatives." Similarly, the 2010 CEQ draft guidance memo notes that "In many cases, the GHG emissions of the project action may be so small as to be a negligible consideration." Importantly, all NEPA documentation needs to be relevant to informing the decision maker and the public about pertinent environmental effects applicable to the decision being made. As such, per the 2009 Washington Office guidance, "an analysis of GHG emissions and carbon cycles is not always appropriate for every NEPA document. As with any environmental impact, GHG emissions and carbon cycling should be considered in proportion to the nature and scope of the federal action in question and its potential to either affect emissions or be affected by climate change impacts." This is reaffirmed by the 2010 CEQ draft guidance memo, which states: "...for Federal actions that require an EA or EIS the direct and indirect GHG emissions from the action should be considered in scoping and, to the extent that scoping indicates that GHG emissions warrant consideration by the decision maker, quantified and disclosed in the environmental document."

The 2010 CEQ draft guidance states:

"Specifically, if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO<sub>2</sub>-equivalent GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. For long-term actions that have annual direct emissions of less than 25,000 metric tons of CO<sub>2</sub>-equivalent, CEQ encourages Federal agencies to consider whether the action's long-term emissions should receive similar analysis."

The Bear Valley GHG emissions analysis (Appendix B) addresses that direction. Under existing conditions, it is estimated that BVM currently emits about 2,650 metric tons of CO<sub>2</sub>-equivalent (CO<sub>2</sub>e). Under the Action alternatives, this is modeled to increase to about 2,900 metric tons, annually. Continual implementation of the Bear Valley Environmental Management Plan (Appendix A) is expected to reduce GHG emissions through actions such as purchasing carbon offsets and converting equipment to more efficient engines.

Finally, the 2009 Washington Office guidance indicates that "actions potentially having effects on climate change that are not discernible at the global scale are unlikely to be determined significant from a climate change standpoint for that reason." The determination is relative to the scope of the environmental effects described in an environmental assessment. Because the context of individual projects and their effects cannot be meaningfully evaluated globally to inform individual project decisions, it is not possible and it is not expected that climate change effects can be found to be "significant" under NEPA and therefore require EIS preparation."

## **Noise**

Ski area operation typically does not produce noise levels outside of guest expectations for a developed winter sports area. No public comments were received identifying noise as a concern, and thus noise was not considered an issue of concern within this analysis.

## **Transportation (Non-Parking)**

During the scoping period no public comments were received related to non-parking transportation issues at BVM. Parking was identified as a need and was analyzed as it relates to the recreational experience of ski area guests. The increase in parking is primarily to meet guest expectations for available day-use parking at BVM.

## **Utilities**

No long-term interruption of utilities or services would take place in the project area. Construction of the projects proposed within the Action Alternatives would not require augmenting the existing utility infrastructure at BVM unless otherwise noted in the Action Alternatives. As such, utilities were not considered an issue of concern within this analysis.

## **Visual Resources**

The BVM SUP area is a Winter Sports Site with a Visual Quality Objective (VQO) of Partial Retention; however, the Forest Plan indicates that VQO Modification is acceptable (USDA 2010, p. 179). Developed Alpine trails and facilities (including chairlifts, guest service buildings, maintenance facilities, etc.) at BVM are located on the north slopes of Koala Top and Bear Top. Currently, none of these facilities are visible from the town of Bear Valley. Although the aesthetic qualities of the project area have been altered over the past six decades, development is consistent with management direction for a Winter Sports Site.

Proposed projects activities would represent incremental additions to the scenic environment within the SUP area, and would not be anticipated to impact the scenic integrity of the project area or BVM's consistency with Winter Sports Site direction. Furthermore, a majority of the proposed projects would not be visible from any key viewpoints in the area. Specifically, the proposed Bear Top Lodge would be effectively screened by existing topography and is therefore not visible from any major viewpoints. As such, visual impacts were not a relevant issue for analysis in this EA (Scenery Report, project file).

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## **3.2 EFFECTS RELATIVE TO ISSUES**

The following sections present the effects of the alternatives relative to the issues identified in Chapter 1.

### **Wildlife Habitat**

**Issue: Proposed projects and activities, including ground and vegetation disturbance, may affect STF Sensitive wildlife and plant species, Management Indicator species, and Threatened/Endangered/Candidate species.**

A BAE was prepared for T&E and Forest Service sensitive terrestrial and aquatic wildlife and plant species. In addition, a MIS Report was prepared. These reports evaluate the beneficial and adverse impacts of the alternatives to wildlife and sensitive plants. This wildlife and vegetation analysis is therefore derived from the BAE (USDA 2010a) and the MIS Report (USDA 2011), both of which are included in the project file.

There are no federally listed Threatened or Endangered terrestrial or aquatic wildlife species that occur in the project area (refer to Table 3-1). Furthermore, no portion of the project area is designated as critical habitat by the Secretary of the Interior.

Table 3-1: Endangered, Threatened, Proposed, Candidate Terrestrial and Aquatic Species that were Considered Outside the Geographic or Elevation Range of the Project Area

| Species Name                                                                   | Status     | Species Present | Habitat Present | Direct/Indirect Effects |
|--------------------------------------------------------------------------------|------------|-----------------|-----------------|-------------------------|
| Valley Elderberry Longhorn Beetle ( <i>Desmocerus californicus dimorphus</i> ) | Threatened | No              | No              | No/No                   |
| California red-legged frog ( <i>Rana draytonii</i> )                           | Threatened | No              | No              | No/No                   |
| Lahontan cutthroat trout ( <i>Oncorhynchus clarki henshawi</i> )               | Threatened | No              | No              | No/No                   |
| Delta smelt ( <i>Hypomesus transpacificus</i> )                                | Threatened | No              | No              | No/No                   |
| Central Valley steelhead ( <i>Oncorhynchus mykiss</i> )                        | Threatened | No              | No              | No/No                   |

**Affected Environment**

As stated earlier, the BVM project area is defined as the SUP boundary and encompasses about 1,888 acres. Within the project area, elevations range between 6,200 and 8,495 feet. Vegetation at this elevation is described as upper montane forest. Stands of California red fir (*Abies magnifica*) are typical of this forest, found occasionally mixed with western white pine (*Pinus monticola*). Other tree species found in this zone include isolated occurrences of mountain hemlock (*Tsuga mertensiana*), lodgepole pine (*Pinus contorta*), and Jeffrey pine (*Pinus jeffreyi*). Habitat conditions have been influenced by past natural and human-caused modifications including road construction, ski area development, and other developed recreation.

Two distinct cover types predominate within the SUP area: red fir (about 916 acres) and mixed montane chaparral communities, which are shrub dominated (about 425 acres). Table 3-2 identifies vegetation types and acreages (based on California Wildlife Habitat Relationships [CWHR] classes) within the BVM SUP area.

**RED FIR FOREST**

Mixed red fir forests dominated by red fir is the most prevalent vegetation type within the SUP (Figure 5, map package). As indicated by CWHR (Version 8.2) datasets, other coniferous species found in the red fir forest include components (about 15% cover) of western white pine and isolated occurrences of mountain hemlock. This habitat is highly variable within the project area, forming dense stands with little understory vegetation at lower elevations and relatively open stands with abundant shrub and herbaceous vegetation at higher elevations. In dense stands, the canopy consists nearly exclusively of red fir. Open stands include scattered Jeffrey pine (*Pinus jeffreyi*) and western white pine (*Pinus monticola*) and a shrub layer of huckleberry oak (*Quercus vacciniifolia*) and mountain whitethorn (*Ceanothus cordulatus*). Herbaceous plants present include mountain monardella (*Monardella odoratissima*) and mule’s ears (*Wyetha mollis*).

Wildlife habitat of concern is considered to be mature forest (defined as late seral, closed canopy). This type of habitat is important to a range of species, including Forest Service Sensitive species (i.e., Pacific fisher and American marten, California spotted owl, and northern goshawk). As defined by CWHR, late seral, closed canopy forest includes trees of size class 4 (12 to 24” dbh) and 5 (>24” dbh) and density classes M (moderate – canopy closure 40 to 59%) and D (dense – canopy closure >60%). The CWHR (Version 8.2) dataset estimated that within the BVM project area; there is about 801

acres of late seral, closed canopy forest, which represents about 42% of the project area. Most (88%) of the closed canopy forest is represented by CWHR size class 4 (624 acres of red fir forest, and 89 acres of mix conifer or pine forest).

Table 3-2: Vegetation Types in the BVM Project Area

| Vegetation Type <sup>a</sup> | Acreage        |
|------------------------------|----------------|
| Annual Grassland             | 86.9           |
| Barren                       | 145.6          |
| Jeffrey Pine                 | 21.2           |
| Lodgepole Pine               | 89.6           |
| Montane Chaparral            | 425.6          |
| Montane Hardwood/Conifer     | 31.2           |
| Red Fir                      | 915.7          |
| Sierran Mixed Conifer        | 5.8            |
| Urban                        | 20.8           |
| Wet Meadow                   | 146.4          |
| <b>Total</b>                 | <b>1,888.7</b> |

<sup>a</sup> although each vegetation type may include numerous size classes and densities, these have been consolidated for the EA. The BAE includes additional information.

### MIXED MONTANE CHAPARRAL

The mixed montane chaparral community comprises a significant portion of the area near the Forest Service/private land boundary in the vicinity of Bear Valley Village and occurs on south facing slopes between Bear Valley Village and Koala Rocks. This community is shrub-dominated and includes mostly huckleberry oak and pinemat manzanita (*Arctostaphylos nevadensis*), although snowbush is also present. Trees are scattered and uncommon and include white fir (*Abies concolor*) and Jeffrey pine.

### NON-FORESTED AREAS

Non-forested areas within the project area include barren area, native montane meadows, and constructed ski slopes.

The CWHR dataset identified about 146 acres of wet meadow within the project area (refer to Table 3-2). Montane meadow vegetation is herbaceous, and dominant species observed in the project area include Pacific lupine (*Lupinus lepidus*), navarretia (*Navarretia spp.*), yarrow (*Achillea millefolium*), leafy aster (*Symphyotrichum foliaceum*), and mule's ears. Montane meadows provide habitat for a variety of wildlife species. Meadow pools and streams provide potential habitat for several species of amphibians. In summer, dry meadows may provide habitat for small mammals and hunting areas for raptors.

Per the CWHR dataset, there are about 146 acres of barren areas within the project area (refer to Table 3-2). These areas are primarily on ridge tops, and most are lahar flows. Scattered herbaceous plants provide some ground cover. In sparse pockets of deeper soil shrub species (e.g., pinemat manzanita) and trees (e.g., incense cedar) are found. The trees are small in size and provide little canopy cover.

Trees and shrubs on the constructed ski slopes are regularly trimmed back so as not to interfere with skiing. The result is that these slopes are now annual grassland.

### **FOREST SERVICE SENSITIVE AND MANAGEMENT INDICATOR SPECIES**

Two birds, two amphibians, six mammals and 15 plants were considered to be inside the geographic or elevation range of the project area and suitable habitat is available for the species. These species, and the effects determinations for each, are summarized in Table 3-3. Additional information for each species, including a description of suitable habitat and life history, can be found in the BAE.

The current bioregional status and trend of populations and/or habitat for each of the MIS is discussed in the 2011 Sierra Nevada Forests Bioregional Management Indicator Species (SNF Bioregional MIS) Report. The MIS and habitat affected by the BVM Expansion project is listed in Table 3-4. Cumulative effects at the bioregional scale are also detailed in the SNF Bioregional MIS Report. The reader is referred to the MIS Report in the project file for more information.

### ***Environment Consequences***

#### **DIRECT AND INDIRECT EFFECTS**

**Issue: Proposed projects and activities, including ground and vegetation disturbance, may affect STF Sensitive wildlife and plant species, Management Indicator species, and Threatened/Endangered/Candidate species.**

Proposed projects at BVM are consistent with the management direction for National Forest System lands within the SUP area. However, construction, implementation, and operation of these projects would likely induce impacts to botanical and wildlife resources that can be disclosed, avoided, and/or mitigated.

#### *Indicators*

- Acreage of habitat (based on California Wildlife Habitat Relationship [CWHR] classes from the BAE) potentially affected by species
- Determination of effects to Sensitive, Management Indicator, and Threatened/Endangered/Candidate species

Table 3-3 identifies direct, indirect and cumulative effects for all alternatives.

#### ***Alternative 1 (No Action)***

Under the No Action Alternative, BVM would continue existing operations and management practices without changes, additions, or upgrades on NFS land. There would be no new development on the south facing slopes between Bear Valley Village and BVM. As a result, there would be no additional direct or indirect effects on terrestrial or aquatic wildlife species or sensitive plant species.

#### ***Alternative 2 (Proposed Action)***

Selection and implementation of Alternative 2 would result in the permanent and long-term removal of vegetation to construct additional parking, the Bear Top Lodge, terrain improvements/ additions, and the Village Lift. In areas that would be fully cleared and graded (e.g., parking areas, the Bear Top Lodge), adjacent cut/fill areas would be revegetated and would eventually support native grasses, forbs, forest trees and shrubs. Grading and vegetation impacts associated with Alternative 2—compared to Alternatives 3—are displayed in Table 3-5. There would be no additional impacts to vegetation types for Alternative 1.

Table 3-3: Estimated Direct, Indirect, and Cumulative Effects for the No Action and Action Alternatives

| Species                                                                 | Alternative 1 |          |      | Alternatives 2 and 3 |          |      |                    |
|-------------------------------------------------------------------------|---------------|----------|------|----------------------|----------|------|--------------------|
|                                                                         | Effects       |          |      | Effects              |          |      | Determination      |
|                                                                         | Direct        | Indirect | Cum. | Direct               | Indirect | Cum. |                    |
| <b>Terrestrial Wildlife Species</b>                                     |               |          |      |                      |          |      |                    |
| Northern goshawk ( <i>Accipiter gentilis</i> )                          | No            | No       | No   | Yes                  | Yes      | Yes  | MA/NL <sup>a</sup> |
| California spotted owl<br>( <i>Strix occidentalis occidentalis</i> )    | No            | No       | No   | Yes                  | Yes      | Yes  | MA/NL              |
| American Marten ( <i>Martes americana</i> )                             | No            | No       | No   | Yes                  | Yes      | Yes  | MA/NL              |
| California Wolverine ( <i>Gulo gulo luteus</i> )                        | No            | No       | No   | Yes                  | Yes      | Yes  | MA/NL              |
| Sierra Nevada Red Fox<br>( <i>Vulpes vulpes necator</i> )               | No            | No       | No   | Yes                  | Yes      | Yes  | MA/NL              |
| Pacific Fisher ( <i>Martes pennanti pacifica</i> )                      | No            | No       | No   | Yes                  | Yes      | Yes  | MA/NL              |
| Townsend's Big-eared Bat<br>( <i>Corynorhinus townsendii</i> )          | No            | No       | No   | Yes                  | Yes      | Yes  | MA/NL              |
| Pallid Bat ( <i>Antrozous pallidus</i> )                                | No            | No       | No   | Yes                  | Yes      | Yes  | MA/NL              |
| <b>Aquatic Species</b>                                                  |               |          |      |                      |          |      |                    |
| Mountain yellow-legged frog<br>( <i>Rana muscosa</i> )                  | No            | No       | No   | No                   | No       | No   | No Effect          |
| Yosemite Toad ( <i>Bufo canorus</i> )                                   | No            | No       | No   | Yes                  | Yes      | Yes  | MA/NL              |
| <b>Plant Species</b>                                                    |               |          |      |                      |          |      |                    |
| Three-bracted Onion ( <i>Allium tribracteatum</i> )                     | No            | No       | No   | Yes                  | Yes      | Yes  | MA/NL              |
| Scalloped Moonwort<br>( <i>Botrychium crenulatum</i> )                  | No            | No       | No   | No                   | No       | No   | No Effect          |
| Mountain Moonwort ( <i>Botrychium montanum</i> )                        | No            | No       | No   | No                   | No       | No   | No Effect          |
| Bolander's Bruchia ( <i>Bruchia bolanderi</i> )                         | No            | No       | No   | No                   | No       | No   | No Effect          |
| Mountain Lady Slipper<br>( <i>Cypripedium montanum</i> )                | No            | No       | No   | No                   | No       | No   | No Effect          |
| Subalpine Fireweed ( <i>Epilobium howellii</i> )                        | No            | No       | No   | No                   | No       | No   | No Effect          |
| Brook Pocket Moss<br>( <i>Fissidens aphelotaxifolius</i> )              | No            | No       | No   | No                   | No       | No   | No Effect          |
| Blandow's Bog Moss ( <i>Helodium blandowii</i> )                        | No            | No       | No   | No                   | No       | No   | No Effect          |
| Short-leaved Hulsea ( <i>Hulsea brevifolia</i> )                        | No            | No       | No   | No                   | No       | No   | No Effect          |
| Veined Water Lichen ( <i>Hydrothyria venosa</i> )                       | No            | No       | No   | No                   | No       | No   | No Effect          |
| Kellogg's Lewisia<br>( <i>Lewisia kelloggii</i> ssp. <i>kelloggii</i> ) | No            | No       | No   | No                   | No       | No   | No Effect          |
| Stebbin's Lomatium ( <i>Lomatium stebbinsi</i> )                        | No            | No       | No   | Yes                  | Yes      | Yes  | MA/NL              |
| Slender Lupine ( <i>Lupinus gracilentus</i> )                           | No            | No       | No   | No                   | No       | No   | No Effect          |
| Three-ranked Hump-moss<br>( <i>Meesia triquetra</i> )                   | No            | No       | No   | No                   | No       | No   | No Effect          |
| Broad-nerved Hump-moss<br>( <i>Meesia uliginosa</i> )                   | No            | No       | No   | No                   | No       | No   | No Effect          |

<sup>a</sup> May affect individuals, but is not likely to contribute to the need for federal listing or result in loss of viability for this species in the planning area.

Table 3-4: Forest Service Management Indicator Species selected for Consideration in the BVM Project Area

| Habitat or Ecosystem Component             | Sierra Nevada Forests<br>Management Indicator Species<br>Scientific Name |
|--------------------------------------------|--------------------------------------------------------------------------|
| Riverine and Lacustrine                    | Aquatic macroinvertebrates                                               |
| Shrubland (west-slope chaparral types)     | Fox sparrow ( <i>Passerella iliaca</i> )                                 |
| Wet Meadow                                 | Pacific tree frog ( <i>Pseudacris regilla</i> )                          |
| Early Seral Coniferous Forest              | Mountain quail ( <i>Oreortyx pictus</i> )                                |
| Mid Seral Coniferous Forest                | Mountain quail ( <i>Oreortyx pictus</i> )                                |
| Late Seral Closed Canopy Coniferous Forest | California spotted owl ( <i>Strix occidentalis occidentalis</i> )        |
|                                            | American marten ( <i>Martes americana</i> )                              |
|                                            | Northern flying squirrel ( <i>Glaucomys sabrinus</i> )                   |
| Snags in Green Forest                      | Hairy woodpecker ( <i>Picoides villosus</i> )                            |

Table 3-5: Summary of Impacts to Vegetation Types under Alternatives 2 and 3

| Vegetation Type   | Clearing (acres) |             | Grading (acres) |             | Total Acreage Impacted |             |
|-------------------|------------------|-------------|-----------------|-------------|------------------------|-------------|
|                   | Alt 2            | Alt 3       | Alt 2           | Alt 3       | Alt 2                  | Alt 3       |
| Annual Grassland  | --               | 0.7         | 2.1             | 1.1         | 2.1                    | 1.8         |
| Barren            | 2.2              | 2.0         | 2.3             | 2.7         | 4.5                    | 4.7         |
| Jeffrey Pine      | 1.5              | 1.4         | --              | --          | 1.5                    | 1.4         |
| Lodgepole Pine    | 2.4              | 3.4         | --              | 0.4         | 2.4                    | 3.8         |
| Montane Chaparral | 3.8              | 2.8         | 0.4             | 2.0         | 4.2                    | 4.8         |
| Perennial Grass   | 0.6              | 0.6         | 2.6             | 3.6         | 3.2                    | 4.2         |
| Red Fir           | 8.7              | 9.7         | 11.5            | 8.4         | 20.2                   | 18.1        |
| Urban             | 0.1              | 0.4         | 0.3             | --          | 0.4                    | 0.4         |
| Wet Meadow        | --               | --          | 0.8             | 0.1         | 0.8                    | 0.1         |
| <b>Total</b>      | <b>19.3</b>      | <b>21.0</b> | <b>20.0</b>     | <b>18.3</b> | <b>39.3</b>            | <b>39.3</b> |

The following discussion of direct and indirect impacts to mammals, aquatic species and plant species is based on Table 3-3. Only species that would potentially be impacted under Alternative 2 are discussed, i.e., species with “No Effect” (no direct or indirect effects) are purposefully omitted. Refer to the Biological Evaluation in the project file for additional information.

*Terrestrial Species*

Mature Forest Species

Some construction activities (lift terminal and tower assembly) would require the use of a Type 1 helicopter in order to transport materials to construction sites. In addition, construction operations (e.g., tree removal and lodge construction) would also increase the noise and activity levels within the project area and could result in short-term avoidance of the area by individuals. There could also be

an increase in stress hormone levels, which could affect reproduction. These sources of disturbance would not be allowed during the breeding season of the northern goshawk (February 15 to September 15), spotted owl (March 1 to August 15), Pacific fisher (March 1 to June 30), or American marten (May 1 to July 31) (refer to Management Requirement for LOPs—provided in Section 2.2 in Chapter 2 in this EA). Owls, goshawks, fisher, and martens would be subject to disturbance from these sources when the LOPs were not in effect. However, these operations would be temporary and therefore potential use of the area by these species would most likely resume once construction activities were complete.

Due to the anticipated increase in number of skiers, there may be a slight increase in disturbance to winter resident species when the ski area is in operation. However, the increase would be slight. The exception would be East Bowl, which currently does not have ski trails. While the area currently has a low level of disturbance, and the disturbance level would increase when ski trails are developed, the anticipated increase is not considered to be high enough to render the project area unsuitable for the species. The installation of utility lines (water and sewer) would be trenched into existing corridors and work roads, resulting in minimal long-term habitat disturbance. Increasing the parking capacity and the construction of the mountain top lodge would likely not impact these species because these facilities are not considered suitable habitat.

The proposed activities include clearing and grading of land for lift installation and clearing for ski trails. The Village Lift and *Mokelumne West Bypass* projects would be constructed within previously undisturbed areas and represent new impacts (e.g., forest openings) within red fir communities at BVM. Clearing activities would remove overstory trees, thereby reducing canopy closure to the point that the habitat would be rendered unsuitable.

California Spotted Owl and Northern Goshawk

Table 3-6 shows the changes in suitable spotted owl and northern goshawk habitat as a result of implementing projects under Alternative 2.

Table 3-6: Changes in Spotted Owl and Northern Goshawk Suitable Habitat under Alternative 2

| Vegetation Type/Size Class/Density | California Spotted Owl |                                      | Northern Goshawk       |                                              |                         |                                               |
|------------------------------------|------------------------|--------------------------------------|------------------------|----------------------------------------------|-------------------------|-----------------------------------------------|
|                                    | Existing Acres         | Acres after Implementation of Alt. 2 | Existing Nesting Acres | Nesting Acres after Implementation of Alt. 2 | Existing Foraging Acres | Foraging Acres after Implementation of Alt. 2 |
| Jeffrey Pine/4/M                   | 4.7                    | 4.3                                  | 4.7                    | 4.3                                          | --                      | --                                            |
| Lodgepole Pine/4/M                 | 74.8                   | 73.5                                 | 74.8                   | 73.5                                         | --                      | --                                            |
| Montane Hardwood/4/D               | 9.6                    | 9.6                                  | 9.6                    | --                                           | 11.9                    | 11.9                                          |
| Montane Hardwood-Conifer/5/P       | --                     | --                                   | --                     | 9.6                                          | 9.6                     | 9.6                                           |
| Red Fir/4/D                        | 230.8                  | 227.2                                | 230.8                  | 227.2                                        | 789.5                   | --                                            |
| Red Fir/4/M                        | 393.3                  | 387.3                                | 393.3                  | 387.3                                        |                         | --                                            |
| Red Fir/5/D                        | 27.6                   | 26.1                                 | 27.6                   | 26.1                                         | 27.6                    | 26.1                                          |
| Red Fir/5/M                        | 60.1                   | 60.1                                 | 60.1                   | 60.1                                         | 60.1                    | 60.1                                          |
| <b>Total</b>                       | <b>800.9</b>           | <b>788.1</b>                         | <b>800.9</b>           | <b>788.1</b>                                 | <b>109.2</b>            | <b>107.7</b>                                  |

A reduction in spotted owl habitat of about 12.8 acres (1.6% of the existing suitable habitat) is expected by the implementation of projects proposed in Alternative 2 (Table 3-6). Likewise, a

reduction of 1.6% in the amount of suitable goshawk nesting habitat (a reduction of 1.4% in the amount of suitable foraging habitat) is anticipated within the project area.

There would be a reduction in the number of snags and the number of downed logs, both important components of spotted owl and goshawk habitat. The reduction would be limited by implementation of Management Requirement 12: where possible, snags and coarse woody material would be retained unless they pose a direct hazard to chairlifts or buildings; and cut trees would be scattered in adjacent, untreated areas where fire/fuel levels are low to provide large woody material (refer to Section 2.2 in this EA). The number of snags post project is expected to meet the species' requirements.

Tree clearing that occurs on existing trail edges (e.g., *Home Run, Lunch Run and Bono's Alley/Water Tank*) is not as likely to measurably impact spotted owl or goshawk habitat as these areas are considered to be marginally suitable habitat due to the existing level of development and fragmentation.

The areas cleared for lift towers would be converted to the URB (urban) CWHR type. The areas cleared for ski trails would become AGS (grassland) the first season after the clearing. Neither of these types is considered suitable habitat for spotted owls or suitable nesting or foraging habitat for goshawks.

#### Pacific Fisher and American Marten

The changes in suitable habitat for the Pacific fisher and American Marten for projects proposed under Alternative 2 would be similar to those discussed for California spotted owl and northern goshawk above. Greater discussion of American Marten effects are provided in the Management Indicator Species section, below. The areas cleared for the lift towers would be converted to the URB (urban) CWHR type. The areas cleared for ski trails would become AGS (grassland) the first season after the clearing. Neither of these types is suitable habitat for fishers or martens.

There would be a reduction in the number of snags and the number of downed logs, both important components of fisher and marten habitat. The reduction would be limited by the retention of snags and coarse woody material, unless they pose a direct hazard to chairlifts or buildings; and cut trees would be scattered in adjacent, untreated areas where fire/fuel levels are low to provide large woody material.

Tree clearing that occurs on existing trail edges (e.g., *Home Run, Lunch Run and Bono's Alley/Water Tank*) is not as likely to measurably impact fisher or marten habitat as these areas are considered to be marginally suitable fisher and marten habitat due to the existing level of development.

#### California Wolverine and Sierra Nevada Red Fox

Alternative 2 would result in the permanent and long-term removal of suitable wolverine and Sierra Nevada red fox habitat to construct additional parking, the Bear Top Lodge, terrain improvements/additions, and the Village Lift. Direct effects would include loss of habitat within BVM. Indirect effects include increased human presence due to the formalization of ski trails in East Bowl. Red fox use essentially the same broad spectrum of habitats as the California wolverine, therefore the distribution of suitable CWHR classes and effect to red fox habitat under Alternative 2 would be similar to California wolverine. Under Alternative 2 there would be about 7.3 acres, or 0.4%, of disturbance to California Wildlife Habitat Relationship System (CWHR) habitat types related to the wolverine and red fox (BAE, project file). Wolverines are known to be intolerant of human presence and would therefore likely avoid using the project area. Although individual wolverine and red fox may be disturbed as project implementation is taking place, LOPs corresponding with forest species (goshawk, spotted owl, marten, and fisher) would be implemented (refer to Section 2.2 in this EA), which would limit construction activities and vegetation treatments effects for the wolverine and red fox. Removal of mature red fir forest under Alternative 2 would increase habitat fragmentation, thereby reducing the habitat suitability in the project area for wolverine. Installation of utility lines

(water and sewer) would not affect habitat requirements for this species as the utility lines would be trenched into existing utility corridors and work roads. Since the proposed projects would occur in an area of high human presence, disturbance to wolverine from construction and additional human activity would be negligible. Where possible, snags and coarse woody material would be retained unless they pose a direct hazard to chairlifts or buildings; therefore, the decrease in snags within the project area is not expected to have an adverse effect on red fox or its population viability.

#### Townsend's Big-Eared Bat and Pallid Bat

No roosting sites for Townsend's big-eared bat are known to occur within the BVM SUP area, although suitable habitat exists within existing ski area facilities. Habitat requirements for Townsend's big-eared bat are essentially the same broad spectrum of habitats as the California wolverine, therefore the distribution of suitable CWHR classes and effect under Alternative 2 would be similar to California wolverine. Likewise, the pallid bat uses essentially the same broad spectrum of habitats as does the Sierra Nevada red fox; therefore, the direct and indirect effects to pallid bat habitat is similar as described for Sierra Nevada red fox.

LOPs corresponding with forest species (goshawk, spotted owl, marten, and fisher) would be implemented, which would limit construction activities and vegetation treatments effects for the Townsend's big-eared bat and the pallid bat. Individuals may be disturbed during project implementation and the LOP is not in effect, however this is expected to be temporary in nature and cease upon completion of project construction. Indirect effects include increased human presence due to the formalization of ski trails in East Bowl. Although no suitable roosting sites are located within East Bowl and it is unlikely that Townsend's big-eared bat utilizes this area except for foraging. Installation of utility lines (water and sewer) would not affect habitat requirements for this species as the utility lines would be trenched into existing utility corridors and work roads. Therefore, implementation of Alternative 2 is not expected to have an adverse effect on Townsend's big-eared bat or the pallid bat, or their population viability.

#### *Aquatic Species*

##### Yosemite Toad

Alternative 2 has the potential to impact suitable breeding and foraging habitat for Yosemite toad. Yosemite toads are most likely to breed in streams and meadows. Under Alternative 2, replacement of the Super Cub lift would result in construction within Cub Meadow. A limited amount of excavation and fill would occur to install one new chairlift tower. Specifically, Alternative 2 would result in about 36 square feet of direct impacts to suitable breeding habitat within Cub Meadow to install the new tower. The three existing towers, which would be removed during the chairlift replacement, are located within a wetland boundary. Individuals may be temporarily affected by construction activities necessary to remove the towers, but this is expected to be temporary in nature and cease once construction activities within the meadow are complete. The foundations of the three removed towers would be left in place.

Construction of the *Bono's Alley/Water Tank* trails has the potential to increase erosion and soil mobilization into an adjacent wetland, which provides suitable breeding habitat for Yosemite toad. Implementation of standard erosion and sediment control BMPs during construction is anticipated to reduce or eliminate altogether sediment delivery into the adjacent wetland (refer to Section 2.2 in this EA). Therefore, this trail is not expected to have any effect on habitat for Yosemite toad.

Approximately 0.6 acre of temporary indirect impacts to potential breeding habitat would occur in Alternative 2 due to tree removal for the *Home Run/Lunch Run* ski trails. Construction activities have the potential to impact individuals through equipment movement or human activities, but this impact is expected to be temporary in nature and cease once project activities have been completed. Once construction activities are complete there would be no direct impact to toad habitat. All other

proposed projects would have no direct impact on breeding habitat as they are located away from known wetlands and meadows.

Alternative 2 would result in about 14.8 acres of potentially suitable foraging and overwintering habitat impacted for lift corridor and ski trail construction. Installation of utility lines (water and sewer) would not affect habitat requirements for this species as the utility lines would be trenched into existing utility corridors and work roads.

**Plant Species**

Three-bracted Onion

Surveys completed in 2007 and 2009 did not detect three-bracted onion (*Allium tribracteatum*) within the project area. There is no habitat for this species affected by the Super Cub chair replacement, construction of the *Mokelumne West Bypass*, construction of the snowshoe traverse, or the East Bowl trail development. The parking lot expansion, the terminal for the village lift, the top of the *Bono’s Alley/Water Tank* trail improvements, the top of *The Village Skiway* development, and the mountain top lodge all occur partially in habitat for *Allium tribracteatum*. Segments of the Village Lift corridor and the *Home Run/Lunch Run* trail improvements also travel through suitable habitat. Under Alternative 2, the total amount of three-bracketed onion habitat that would be affected is 2.2 acres; however due to the absence of this species from surveys; it is unlikely Alternative 2 would have an effect on this species.

Stebbin’s Lomatium

The habitat requirements for Stebbin’s lomatium (*Lomatium stebbinsi*) are similar to those required for three-bracted onion. Therefore, the impacts to *Stebbin’s lomatium* under Alternative 2 would as described for three-bracketed onion.

Table 3-7: Summary of Effect to Management Indicator Species – All Alternatives

| Habitat or Ecosystem Component             | Management Indicator Species<br>Scientific Name                   | Determination of Effect – All Alternatives                                                                                                                                                                             |
|--------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Riverine and Lacustrine                    | Aquatic macroinvertebrates                                        | The implementation of Alternative 2 or 3 would not alter the existing trend in the habitat, nor would it lead to a change in the distribution across the Sierra Nevada bioregion for all MIS habitats and MIS species. |
| Shrubland (west-slope chaparral types)     | Fox sparrow ( <i>Passerella iliaca</i> )                          |                                                                                                                                                                                                                        |
| Wet Meadow                                 | Pacific tree frog ( <i>Pseudacris regilla</i> )                   |                                                                                                                                                                                                                        |
| Early Seral Coniferous Forest              | Mountain quail ( <i>Oreortyx pictus</i> )                         |                                                                                                                                                                                                                        |
| Mid Seral Coniferous Forest                |                                                                   |                                                                                                                                                                                                                        |
| Late Seral Closed Canopy Coniferous Forest | California spotted owl ( <i>Strix occidentalis occidentalis</i> ) |                                                                                                                                                                                                                        |
|                                            | American marten ( <i>Martes Americana</i> )                       |                                                                                                                                                                                                                        |
|                                            | Northern flying squirrel ( <i>Glaucomys sabrinus</i> )            |                                                                                                                                                                                                                        |
| Snags in Green Forest                      | Hairy woodpecker ( <i>Picooides villosus</i> )                    |                                                                                                                                                                                                                        |

**Management Indicator Species**

A MIS report was prepared in conjunction with this analysis considered the effects of the proposed projects on designated management indicator species. Table 3-7 presents a summary of the determination of combined effects from the Action Alternatives for MIS that are known to occur, or have the potential to occur, within the BVM project area. The BAE and MIS report (project file) contain additional information.

#### Riverine and Lacustrine, Aquatic Macroinvertebrates

Under Alternative 2, no direct or indirect impacts to aquatic macroinvertebrates would occur. Sediment delivery to all watercourses would be reduced through the use of standard construction BMPs during the implementation of Alternative 2. The proposed skier bridge on *Home Run* would cross a perennial stream channel, but would not directly impact aquatic habitat as the structures for the bridge would be placed outside the ordinary high water mark and the bridge would span the channel.

#### Shrubland, Fox Sparrow

Direct impacts to shrubland habitat would result from the construction of the Village Lift towers (about 100 square foot per tower), and any necessary clearing for trails and the lift corridor. Clearing and grading activities would also impact shrubland habitat for lift corridor and trail construction. The total number of acres of shrubland habitat that would be removed is 3.1 acres, which represents 1% of this habitat type in the project area (USDA 2011). Alternative 2 would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of fox sparrows across the Sierra Nevada bioregion.

#### Wet Meadow, Pacific Tree Frog

The habitat requirements for the pacific tree frog are similar to those of Yosemite toad. Under Alternative 2 the only projects which have the potential to impact pacific tree frog habitat would be the replacement of Super Cub, trail grading on *Water Tank*, and clearing for the *Home Run/Lunch Run*. Therefore, the impacts to pacific tree frog habitat would be as described for Yosemite toad.

#### Early and Mid Seral Coniferous Forest, Mountain Quail

Under Alternative 2, a total of 11.2 acres of mountain quail habitat would be lost through the clearing and grading for ski trails and the lift corridors, and development of parking lots. Indirect effects include increased human presence in the area during and after construction. The removal of the 11.2 acres of habitat would not result in a decrease in the viability of the population of mountain quail. Habitat trends for mid-seral coniferous forest have increased in the last decade from 21% to 25% of the acres on NFS Lands. Currently there are 2,766,000 acres of mid-seral coniferous forest habitat on NFS lands; under Alternative 2, the decrease of 11.2 acres of mid-seral forest would have no effect on this species.

#### Late Seral Closed Canopy Coniferous Forest, California Spotted Owl, American Marten, and Northern Flying Squirrel

##### California Spotted Owl

Suitable habitat for California spotted owl exists within the BVM SUP area. Effects related to the California spotted owl were also discussed above in the “*Mature Forest Species: California Spotted Owl, Northern Goshawk, American Marten, and Pacific Fisher*” section.

The reduction in habitat under Alternative 2 would be 12.8 acres, or 1.6%, of the existing suitable habitat. Noise from construction activities has potential to impact the suitability of habitats adjacent to the project locations. On a temporary, construction basis—use of a helicopter to transport lift and tower assemblies and the use of ground based construction equipment—could decrease the suitability of the habitat for use by California spotted owls. The construction noise would be intermittent and for a relative short duration and would not have a lasting impact on habitat suitability due to the existing human activity and associated noise.

##### American Marten

The American marten was selected as an MIS for late seral closed canopy coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, and red fir) habitat in the Sierra Nevada. Suitable

habitat for American marten exists within the BVM SUP area. Effects related to the American marten were also discussed in the “*Mature Forest Species: California Spotted Owl, Northern Goshawk, American Marten, and Pacific Fisher*” section.

Alternative 2 includes proposed clearing and grading of land for lift installation and clearing for ski trails. The Village Lift and Mokelumne West Bypass projects would be constructed within previously undisturbed areas and represent new impacts (e.g., forest openings) within red fir communities at BVM, and would represent an increase in habitat fragmentation. Alternative 2 would reduce available marten habitat within the project area from 87.7 acres to 86.2 acres. This represents a reduction of 1.7% in the amount of suitable marten habitat within the project area.

Implementation of Alternative 2 would have no effect on the existing trend in the habitat, nor would the projects in Alternative 2 lead to a change in the distribution of American marten across the Sierra Nevada region.

Indirect impacts to marten include increased human presence and activity, decreased foraging areas and noise at BVM. Construction activities under Alternative 2 would likely result in increased traffic on mountain roads, with potential for road kills.

#### Northern Flying Squirrel

The habitat requirements for the northern flying squirrel are similar to those of the California spotted owl and American marten. Therefore, the impacts to the northern flying squirrel under Alternative 2 would be similar as described for the above species.

#### Snags in Green Forest, Hairy Woodpecker

The hairy woodpecker was selected as the MIS for snags in green forests. There would be a reduction in the number of snags and downed logs under Alternative 2. Where possible, snags and coarse woody material would be retained unless they pose a direct hazard to chairlifts or buildings; therefore, the decrease in snags within the project area is not expected to have an adverse effect on the hairy woodpecker or its population viability.

Indirect effects include increased human presence in the area. Habitat trends for medium sized and large snags has increased for red fir forest as well as mixed conifer forest on NFS lands. The decrease in snags within BVM is not expected to have an adverse effect on hairy woodpecker or its population viability. No effect to this species would occur as a result of Alternative 2.

### **Alternative 3 (Improved Skier Circulation)**

Alternative 3 impacts to wildlife and vegetation would be similar to Alternative 2, except that Alternative 3 would increase the amount of vegetation removal due to proposed trail clearing in Sunrise Bowl and would decrease impacts in late seral stage vegetation (primarily red fir—refer to Table 3-5). Alternative 3 includes two new lifts to provide access to BVM from the Village, as compared to one in Alternative 2. Under Alternative 3, about 3.8 acres of tree removal would be required to provide groomable intermediate trails in Sunrise Bowl. There would be about 1.5 acres of impact to mature forest habitat from the construction of *Mokelumne West Bypass*, the Village Lift and Sunrise Bowl Lift.

The reader is referred to Tables 3-3 and 3-4 for more information regarding the differences in the impacts to wildlife and vegetation between Alternative 2 and 3.

### **CUMULATIVE EFFECTS**

This cumulative effects analysis for wildlife and vegetation resources is organized similar to Direct and Indirect Environmental Consequences—by terrestrial species, aquatic species, and plants. Unless otherwise noted, the Cumulative Effects Analysis Area (CEAA) is defined as the 6th field watersheds

of Bloods Creek and Mattley Creek. This analysis represents a summary of information presented in the BAE and MIS report, which are included in the project file.

The primary activities on Federal and private lands that have impacted, or will impact, terrestrial species, aquatic species, and plants in their respective cumulative effects analysis areas (CEAA – defined separately for each, below) include:

- past and current vegetation management projects (including timber harvest, hazard tree management, and fuel management),
- road construction and use,
- ski area development/maintenance,
- livestock grazing,
- developed/dispersed recreation activities.
- private land development (principally in Bear Valley Village),
- water development projects (e.g., the construction of Bear Lake), and
- human habitation.

Table 3-8: Past, Present and Reasonably Foreseeable Future Projects on Public Lands Within the CEAs for Terrestrial Wildlife, Amphibians and Plants

| Project Name                                  | Timeframe              | Area of Impact: Terrestrial Wildlife (acres) | Area of Impact: Amphibians (acres) | Area of Impact: Plants (acres) |
|-----------------------------------------------|------------------------|----------------------------------------------|------------------------------------|--------------------------------|
| Grazing                                       | On-going               | 9,600                                        | 600                                | n/a                            |
| <b>Recreation Projects</b>                    |                        |                                              |                                    |                                |
| Bear Valley Mountain Ski Area Construction    | Past                   | n/a                                          | n/a                                | n/a                            |
| Round Valley Trailhead Improvement            | Reasonably Foreseeable | 1                                            | 1                                  | 1                              |
| Motorized Travel Management                   | On-going               | n/a                                          | n/a                                | n/a                            |
| <b>Vegetation Management Projects</b>         |                        |                                              |                                    |                                |
| Bear Valley Timber Stand Improvement          | On-going               | 248                                          | 19                                 | 34                             |
| Hazard Tree Management                        | On-going               | 218                                          | 102                                | 12                             |
| Bloods-Thompson Vegetation Management Project | Reasonably Foreseeable | n/a                                          | n/a                                | n/a                            |
| Bloods Ridge Fuels Reduction                  | Existing               | 19                                           | 19                                 | 19                             |
| <b>Total</b>                                  |                        | <b>10,085</b>                                | <b>741</b>                         | <b>66</b>                      |

<sup>a</sup> the Bloods-Thompson Vegetation Management Project is no longer a reasonably-foreseeable future action because a proposed action has not been developed. However, this project was included in the BAE, using an estimate of the highest the amount of potential impact to the species, and is therefore identified in this table.

<sup>b</sup> grazing only impacts meadow and grassland-dependent species (i.e., it is not likely to affect late-seral species such as spotted owl, northern goshawk, Pacific fisher, or pine marten).

Table 3-8 identifies present and reasonably foreseeable future projects on public land within the CEAs for terrestrial species, aquatic species, and plants, as well as estimates of the area of impact to each.

Virtually all the past, present, and reasonably foreseeable activities in CEAs have, do, or will cause some level of direct and indirect (and therefore cumulative) disturbance to mammals, aquatic species and plants. Activities such as recreation and road use are on-going sources of impacts. BVM is an established winter sports venue that currently experiences relatively high levels of human use within its SUP area when compared to surrounding NFS lands. All current and future visitation at BVM would occur within the permitted area and is not anticipated to have potential expand onto adjacent NFS lands with different management intents.

### **Terrestrial Wildlife**

*Mature Forest Species: California Spotted Owl, Northern Goshawk, American Marten, Pacific Fisher, and Northern Flying Squirrel*

Past vegetation management on public land included clearcutting, partial cutting, and prescribed burning. Clearcutting on public land had the same effects as on private land. Prescribed burning could have decreased the canopy cover in stands, or removed them entirely. Partial cutting often reduced canopy cover, sometimes to below 40%. This would have resulted in impacts to species dependant on late seral closed canopy coniferous forest for parts or all of their life cycle (including California spotted owl, American marten, and northern flying squirrel). At the same time, fuel reduction on both public and private land would have reduced the risk of a stand-replacing wildfire and so the risk of loss of this habitat type.

Development of the ski area may have impacted late seral closed canopy coniferous forest habitat. Habitat may have been permanently cleared for facility placement. Clearing and grading activities for lift line and trail construction within late seral closed canopy coniferous forest would result in a conversion of habitat types. Maintenance of the ski area would have no effect on the amount of late seral closed canopy coniferous forest habitat.

Planned development within Bear Valley Village is not expected to have a measurable impact on this habitat, as any habitat within the Village is assumed to have already been impacted substantially.

The BVM Expansion project would impact 12.4 acres (14.1%) of late seral closed canopy coniferous forest habitat under both Alternatives 2 and Alternative 3 (less than 1.0% of this habitat in the CEAA). The loss of less than 1.0% of this habitat would add little to the cumulative effects to this habitat, and is not expected to cumulatively affect the California spotted owl, northern goshawk, American marten, or northern flying squirrel. The proposed project under Alternative 2 and 3—when considered with the cumulative effects of past, present, and reasonably foreseeable future projects on public land within the CEAs—may affect the California spotted owl, northern goshawk, and American marten, but is not likely to contribute to the need for federal listing or result in loss of viability for this species in the planning area (Table 3-3). Likewise, the implementation of the Alternative 2 or 3 would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of the California spotted owl, American marten, and northern flying squirrel across the Sierra Nevada bioregion (Table 3-7). California Wolverine and Sierra Nevada Red Fox

The high level of human use in the project area and the proximity of the Bear Valley Village likely contribute to an avoidance of the area by wolverine. Wolverines do not tolerate land use activities that permanently alter or fragment habitat and provide human. However, habitat exists in the project area, there is a potential for use of the area by the species. Disturbance of the California wolverine and Sierra Nevada red fox could therefore increase. Implementation of LOPs would reduce the level of disturbance from project implementation. The number of snags would be reduced, thus lowering habitat quality. The extent of snag removal would be limited.

Under Alternative 2, about 7.3 acres, or less than 0.1% of suitable habitat in the terrestrial wildlife cumulative effects area, would be rendered unsuitable. Under Alternative 3, about 7.8 acres would be

rendered unsuitable, about the same percentage of the suitable habitat in the terrestrial wildlife cumulative effects area. This would add little to the cumulative effects for these two species.

Therefore, cumulatively, the BVM Expansion project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the California wolverine or the Sierra Nevada red fox in the planning area (Table 3-3).

#### *Townsend Big Eared Bat and Pallid Bat*

Disturbance to Townsend big eared bats and pallid bats could increase. Implementation of LOPs would reduce the level of disturbance from project implementation.

Under Alternative 2, about 7.3 acres, or less than 0.1 of suitable habitat in the terrestrial wildlife cumulative effects area, would be rendered unsuitable. Under Alternative 3, about 7.8 acres would be rendered unsuitable, about the same percentage of the suitable habitat in the terrestrial wildlife cumulative effects area. This would add little to the cumulative effects on the species.

Therefore, cumulatively, the BVM Expansion project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the Townsend's big-eared bat or pallid bats in the planning area.

#### *Mountain Quail*

The BVM Expansion project would not alter the existing trend in mountain quail habitat, nor would it lead to a change in the distribution of mountain quail across the Sierra Nevada bioregion. The proposed projects would affect about 1.7 to 1.8% of available early and mid-seral conifer forest habitat within the project area. Combined with other projects identified in the CEAA, this loss of habitat is not expected to be measurable at the larger Sierra Nevada bioregion scale. Therefore, the implementation of Alternative 2 or 3 would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of mountain quail across the Sierra Nevada bioregion (Table 3-7).

#### *Hairy Woodpecker*

The reduction in snag levels under the BVM Expansion project would add to that from the past, current, and reasonably foreseeable projects (hazard tree management, vegetation management, private land development) in the CEAA for hairy woodpecker, but the contribution to the cumulative effects would not be large as little area would be affected by snag removal. The potential decrease in medium-sized snags per acre in the project area would not alter the existing trend in the ecosystem component, nor would it lead to a change in the distribution of hairy woodpecker across the Sierra Nevada bioregion. Therefore, implementation of the Alternative 2 or 3 would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of the hairy woodpecker across the Sierra Nevada bioregion (Table 3-7).

#### **Aquatic Species**

##### *Pacific Tree Frog and Yosemite Toad*

The BVM Expansion project would impact 0.6 acre of wet meadow under Alternative 2 and 0.5 acre under Alternative 3. The clearing would involve the removal of trees such as lodgepole pine, and would not remove the meadow habitat. Grading and facility construction would impact very little acreage (less than 0.01 acre). Thus, the BVM Expansion project would contribute very little to cumulative effects on wet meadow habitat in the CEAA. The proposed projects, under alternatives 2 and 3, when considered with the cumulative effects of past, present, and reasonably foreseeable future projects on public land within the CEAs, may affect the Yosemite toad, but is not likely to contribute to the need for federal listing or result in loss of viability for this species in the planning area (Table 3-3). Likewise, the implementation of Alternative 2 or 3 would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of the Pacific tree frog across the Sierra Nevada bioregion (Table 3-7).

### *Aquatic Macroinvertebrates*

Proposed activities in the BVM Expansion project are not expected to measurably impact water quality and would reduce water surface shade very little. The project would not affect downstream water quality or existing beneficial uses on the Mokelumne and Stanislaus Rivers (Watershed Resources Technical Report, project file). It would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of the aquatic macroinvertebrates across the Sierra Nevada bioregion (Table 3-7). Thus, implementation of Alternative 2 or 3 would not result in cumulative effects in the CEAA.

### **Plant Species**

The CEAA for sensitive plants is defined as the BVM SUP area, private lands in Bear Valley Village, and also includes the ridge above Highway 207 to the north of Poison Canyon and Bloods Ridge to the west. This is the area within which past, present, and reasonably foreseeable activities could impact plant occurrences. The sensitive plant CEAA is about 2,900 acres in area.

Cumulatively the BVM Expansion project, combined with other past, present and reasonably-foreseeable future projects may affect individuals of one sensitive plant species (*Allium tribracteatum*), but is not likely to result in a trend toward Federal listing or loss of viability of the species in the planning area. This is discussed in detail, below. Only species with potential to be directly and/or indirectly impacted (discussed under Direct and Indirect Environmental Consequences) are discussed here.

#### *Three-Bracted Onion (Allium tribracteatum) and Stebbin's Lomatium (Lomatium stebbinsii)*

The Bloods Ridge Fuel Reduction may have impacted suitable habitat for some species. Compaction from the equipment used in the fuel reduction could negatively impact plants. Compaction could reduce porosity in the soil, thus limiting the spread of roots because of reduced soil penetrability, and limiting water availability when the plants are developing because of reduced retention of water in the soil in the spring. Because of the granular structure of the soil in lahar flows, compaction would be limited. The estimated amount of habitat impacted is 5 acres (out of 19 acres in the CEAA identified in Table 3-8).

Development of the ski area did impact habitat for these species. Some facilities are located on lahar flows and other barren areas. The barren areas were used in construction, and continue to serve as maintenance routes.

On-going maintenance operations for the ski area could impact these species. Removal of hazard trees that pose a risk to individuals or damage to improvements across the SUP would not impact the species. However, clearing of brush and trees that start to grow under lift lines and in and along ski trails would occur. Individuals could be crushed during the clearing operations. Compaction could result from the equipment used. The effects of compaction are described above. However, as most of the maintenance operations would be conducted by hand, compaction would be minor. In addition, because of the small acreage (a few acres in these species' habitat) of land involved, the impact is anticipated to be minimal.

Development within Bear Valley Village is not expected to impact these species. Any habitat that exists within the Village has already been substantially impacted; thus it is no longer considered suitable.

The STF recently completed an EIS for motorized travel management. The document designates routes that are open to the public and that will be maintained so resource damage will be reduced, including that to barren areas.

The amount of habitat for these species which would be affected by the BVM Expansion project is 2.2 acres, less than 0.1% of the potential habitat in the plant CEAA. Thus, the BVM Expansion

project would contribute little to the cumulative effects on these species. In addition, the effects of the past, present, and reasonably foreseeable activities in the plant CEAA would have little effect on the species because of the small amount of land affected by those activities.

Cumulatively the BVM Expansion project, combined with other past, present and reasonably-foreseeable future projects may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for three-bracted onion and Stebbin’s lomatium in the planning area.

**Soils and Watershed**

**Issue: Proposed ground disturbing activities have potential to affect soil and watershed resources.**

**Geology and Soils**

The scope of this soils analysis encompasses the existing BVM SUP boundary and focuses potential impacts to unstable slopes and increases in soil erosion.

**AFFECTED ENVIRONMENT**

**Soils**

The project area is located in the central Sierra Nevada physiographic province of California. The closest potentially active seismic source is the Genoa Fault (Carson Range fault zone), located about 30 kilometers to the northeast along the eastern edge of the Sierra Nevada.

Soils within the project area have been influenced by past glaciation and volcanic activity (Mehrten Formation). Granitic formations (granodiorite) are present throughout the project area at lower elevations. The volcanic soils are primarily from the Windy Family, Andic- and Lithic-Cryumbrepts. These soils are typically gravely sandy loams with moderate to high erosion hazard ratings. The granitic soils are primarily from the Gerle Family or from sandy shallow soils, Lithic Xeropsaments. Table 3-9 identifies soil map units within the project area as based on the USFS Order 3 Stanislaus Soil Survey (USDA 1995).

Table 3-9: Existing Soils within the BVM Project Area

| Soil Zone | Map Unit | Map Unit Name                                                                           |
|-----------|----------|-----------------------------------------------------------------------------------------|
| South     | 167      | Lithic Cryumbrepts-Rock Outcrop-Windy Family, Moderately Deep Complex, 35 to 70% Slopes |
|           | 183      | Rock Outcrop                                                                            |
|           | 186      | Rock Outcrop-Gerle Family, Bouldery Complex, 5 to 35% Slopes                            |
| Developed | 193      | Windy Family, Deep-Moderately Deep Complex, 5 to 35% Slopes                             |
|           | 196      | Windy Family, Moderately Deep-Deep Complex, 35 to 60% Slopes                            |
|           | 101      | Andic Cryumbrepts-Lithic Cryumbrepts-Rock Outcrop Complex, 20 to 70% Slopes             |
|           | 165      | Lithic Cryumbrepts-Rock Outcrop Complex, 10 to 100% Slopes                              |
| North     | 107      | Entic Cryumbrepts, Deep, 1 to 10% Slopes                                                |
|           | 168      | Lithic Xeropsaments-Rock Outcrop Complex, 5 to 70% Slopes                               |

For purposes of this analysis, the project area was divided into 3 zones. The soil map units are displayed by zone. Soil type, soil productivity, soil cover and erosion hazard varies by zone. The middle zone is referred to as “developed” and contains the majority of the existing BVM operations and developed facilities. The north and south zones are mostly undeveloped with native vegetation and natural conditions.

Additionally, one soil type is present in all three zones: Gerle Family, Bouldery-Rock Outcrop Complex, 5 to 35% Slopes (Map Unit 114).

Soil productivity within the BVM project area is impacted primarily in the developed zone, which contains areas that were converted to impervious surfaces, including the day lodge, parking lot, and other buildings. Existing ski area work roads also contribute to detrimental soils.

**Soil Erosion**

The erosion hazard was modeled using a computerized version of Universal Soil Loss Equation (USLE). The process is further documented in the project file, including GIS map products. Existing soil cover (an input variable) was mapped by GIS using recent high resolution imagery. Major soil cover classes are summarized in Table 3-10.

Table 3-10: Major Soil Cover Classes in the BVM project area – Existing Conditions

| Soil Cover Class                                 | Acreage |
|--------------------------------------------------|---------|
| Asphalt and Facilities                           | 22.8    |
| Roads, native surface                            | 34.7    |
| High Erosion Hazard – legacy disturbed low cover | 10.0    |
| High Erosion Hazard – natural low cover areas    | 70.0    |
| Low to Moderate Erosion Hazard Areas             | 1,752   |

Areas exhibiting higher erosion rates are associated with native surface roads, ski runs with sparse or low cover, and lava cap soils with sparse cover. These areas are at a higher risk for erosion and are indicated by soil cover class. The lower erosion rates are found in undisturbed forested and rock outcrop conditions. Erosion rates range from 0 to 6.9 tons/acre/year based on the USLE analysis.

In total, erosion is about 875 tons per year (refer to Table 3-11) across the project area. The North Zone was analyzed to have low erosion rates and disturbance. The Developed (Middle) Zone currently experiences variable erosion rates (highest per acre rate) related primarily to the historical pattern of disturbance and clearing. The South Zone erosion rates are variable and related to the natural vegetation cover and soil.

Table 3-11: Existing Erosion Rates within the BVM Project Area

| Zone         | Contributing Area (acres) | Existing Erosion Rates (tons/yr) |
|--------------|---------------------------|----------------------------------|
| Developed    | 400                       | 283                              |
| South        | 934                       | 534                              |
| North        | 536                       | 58                               |
| <b>Total</b> | <b>1870</b>               | <b>875</b>                       |

**ENVIRONMENT CONSEQUENCES**

***Direct and Indirect Effects***

*Alternative 1 (No Action)*

Under Alternative 1, there would be no increase in impervious surfaces or detrimental/disturbed soil conditions within the BVM project area. With no improvements to ski area facilities, there would continue to be about 22.8 acres of asphalt and facilities, 34.7 acres of dirt roads, and 10 acres of disturbed soil with sparse cover.

*Alternative 2 (Proposed Action)*

Soils

Under Alternative 2, project activities would impact the soil resources in the project area primarily through addition of impervious surfaces and trail clearing and grading which remove or compact soils. A majority of the soil impacts would occur on Map Units 193 and 196, which is the Windy Family soil group.

Table 3-12: Comparison of Detrimental Soil Conditions by Alternative

| Soil Condition                         | Existing Conditions (acres) | Alternative 2 (acres) | Alternative 3 (acres) |
|----------------------------------------|-----------------------------|-----------------------|-----------------------|
| Asphalt and Facilities                 | 22.8                        | 25.5                  | 25.5                  |
| Trail Grading                          | n/a <sup>a</sup>            | 15.6                  | 15.9                  |
| Legacy Disturbed                       | 10.0 <sup>b</sup>           | 10.0                  | 10.0                  |
| Low Cover (potential increase)         | 0                           | 11.6                  | 11.2                  |
| Roads, native surface                  | 34.7                        | 34.7                  | 34.7                  |
| <b>Total Detrimental Soils (acres)</b> | <b>67.5</b>                 | <b>97.6</b>           | <b>97.3</b>           |

<sup>a</sup> Existing ski trail were assumed to not be in a graded condition

<sup>b</sup> Represents "legacy" conditions, where the existing pattern of disturbance and clearing resulted in low vegetative ground cover.

The construction of new impervious surfaces (e.g., parking lots, buildings, lift terminal and towers) would increase by about 2.6 acres (refer to Table 3-12). Trail grading activities on the proposed *Mokelumne West Bypass* and *Bono's Alley/Water Tank* would have the greatest impact under Alternative 2, totaling about 15.7 acres.<sup>11</sup> Additionally, detrimental soil conditions would be increased by extensive grading activities if topsoil is lost or displaced during construction and vegetative cover is not reestablished. For purposes of this analysis, topsoil is defined as the <6 inch depth of native mineral soil for soils present in the project area. For Alternative 2, as much as 12,000 cubic yards of topsoil could be harvested from the about 15.7 acres of graded sites across the project area. The disturbed low cover (10 acres) represents "legacy" conditions, where the existing pattern of disturbance and clearing in the "developed" zone resulted in low vegetative ground cover.

Under Alternative 2, the proposed projects would increase the low cover class (25 to 50% cover) by 11.6 acres. This class is primarily associated with modifying the terrain or the vegetation on ski trails. The net change in erosion on these acres is likely to be 1 to 3 tons per acre increase over the existing condition.

<sup>11</sup> Condor Earth Technologies, Inc. evaluated the existing geologic conditions along the lower portion of the proposed *Mokelumne West Bypass*. The Condor report is contained in the project file.

Erosion

A computerized version of USLE (Universal Soil Loss Equation) was used with the Region 5 BAER Dataset (TenPas 2005).

Assumptions used for this analysis are as follows:

- Improved trails such as *Home Run* and *Lunch Run* would not change much from existing condition because ground cover and tree cover would not be substantially reduced.
- Proposed grading/vegetation removal related to *Mokelumne West Bypass* and *Water Tank* would lead to a reduction in cover class where clearing or grading occurs.
- The amount and quality of cover expected to grow on new trails can be estimated by looking at the existing trails.
- Short term, construction related conditions were not modeled. BMPs specifically designed to correct short-term impacts are well understood and are commonly applied with good results.
- The long-term conditions such as a permanent loss of vegetation and ground cover, or a loss of topsoil by grading, would be expected to have the greatest effect on long-term soil productivity throughout the project area.

Under Alternative 2 the proposed project activities would increase long-term erosion rates within the project area by about 16.6 tons per year (refer to Table 3-13). The majority of the increased erosion would occur within the Developed Zone for proposed grading projects associated with the *Mokelumne West Bypass* and *Bono's Alley/Water Tank* trail improvements. These projects contain the most amount of grading, and as modeled (project file) have the largest potential to influence erosion. Overall, it is anticipated that Alternative 2 would increase erosion in the Developed Zone by about 5% over the existing condition and increase long-term erosion by about 2% project wide, with almost no change in the South and North zones.

Overall the erosion rates modeled are quite low, but reasonable given the assumptions built into the model (e.g., Soil Management Practices and BMPs). Additionally, implementation of the Mitigation Measures and Management Requirements outlined in Section 2.2 are anticipated to reduce the effects of proposed projects on soil erosion within the project area. The precipitation zone for BVM is also a mitigating factor. Most of the annual precipitation occurs as snow and the elevation of the ski area is above the “rain-on-snow” belt which lowers the general erosion hazard.

Table 3-13: Comparison of Total Erosion by Alternative

| Zone         | Existing Erosion Rates<br>(tons/yr) | Alternative 2        | Alternative 3        |
|--------------|-------------------------------------|----------------------|----------------------|
|              |                                     | Change from Existing | Change from Existing |
| Developed    | 283                                 | 16.4                 | 15.0                 |
| South        | 534                                 | 0.2                  | 0.5                  |
| North        | 58                                  | -                    | -                    |
| <b>Total</b> | <b>875</b>                          | <b>16.6a</b>         | <b>15.8a</b>         |

<sup>a</sup> Spring Gap Run was deleted from the project, therefore the increase in total erosion is expected to be less than 16 tons.

Erosion models have their limitations; they are best suited as general comparisons of alternatives and are not true predictors of long-term conditions. The long-term conditions such as a permanent reduction of vegetation and ground cover, or a loss of topsoil by grading will, as stated, have the greatest effect on long-term soil productivity. Soil mitigation measures applied to the Proposed

Action (Alternative 2) would influence the stability of the soils and slopes. A preliminary review of the proposed *Mokelumne West Bypass* trail completed by Condor Earth Technologies indicated that trail construction could be completed through excavation and engineered backfill keyed into the native materials. Toe-slopes may need additional stabilization using gabion walls, but further geotechnical review of the project site would be warranted prior to construction.

### *Alternative 3 (Improved Skier Circulation)*

#### Soils

Under Alternative 3, project activities would impact the soil resources as described under Alternative 2 (refer to Table 3-12), with the exception that slightly less soil would be disturbed by grading. Detrimental soil conditions would increase by 2.6 acres as a result of proposed impervious surfaces from increased parking area, lift terminals and Bear Top Lodge particularly if topsoil is lost or displaced during construction and vegetative cover is not reestablished. Legacy conditions are also noted but are not expected to increase.

Trail grading activities would be reduced under Alternative 3 as *Bono's Alley* would not be graded. However, the proposed grading on Water Tank and the *Mokelumne West Bypass* would have the potential to increase detrimental soil conditions if vegetated cover cannot be established after construction.

#### Erosion

Similar to Alternative 2, the proposed project activities under Alternative 3 would increase the amount of low cover classed areas by 11.2 acres (refer to Table 3-12). As a result, modeled erosion rates would increase by about 15.8 tons per year under Alternative 3 (refer to Table 3-13), compared with 16.6 tons per year under the Proposed Action.

### **Cumulative Effects**

For purposes of evaluating cumulative effects to Geology and Soils, the Cumulative Effects Analysis Area (CEAA) is defined as the BVM project area, and encompasses about 1,911 acres. The primary federal activities impacting soils within the CEAA are related to the past development of the ski area, proposed vegetation management projects (including timber harvest, hazard tree management, and fuel management), motorized use of roads, firewood gathering, and recreation (including developed and dispersed).

Of the primary federal activities impacting soils in the CEAA, only one project—the Bear Valley TSI—occurs within the CEAA; all other projects occur outside the CEAA for Geology and Soils and are therefore not considered further. The Bear Valley TSI project may result in small areas of soil compaction as a result of forest health improvements activities. However, this project is not expected to result in cumulative loss of soil productivity or increased detrimental soil conditions as this project is designed to maintain healthy forest.

Detrimental soil conditions within the project area would be increased by a maximum of about 30 acres under Alternative 2—about 1.6% of the CEAA—to a total of about 6%. Total detrimental soils within the CEAA would not increase above 6%. Therefore, implementation of the Action Alternatives is not expected to result in cumulative impacts to soils within the CEAA.

### **Watershed Resources**

This Watershed Resources analysis is primarily focused on drainages within the BVM SUP area; however, since impacts at a given point in a watershed may be transmitted downstream, potential effects to HUC (hydrologic unit code) Level 7 watershed resources are also analyzed under a Cumulative Watershed Effects (CWE) analysis. This analysis responds to concerns regarding the proposed ski area expansion and impact to streams, wetlands, and water quality. A complete

watershed resources technical report can be found in the project file at the Calaveras Ranger District, and is incorporated by reference.

## **AFFECTED ENVIRONMENT**

### ***Watershed Setting***

The BVM project area is located within two HUC 7 watersheds, Blood's Creek and Mattley Creek. These watersheds drain into the larger HUC Level 4 watersheds of the Stanislaus and Mokelumne Rivers. The HUC 7 Mattley Creek watershed is about 16,800 acres in size and drains to the Mokelumne River. The majority of the existing ski area development falls within this watershed. The HUC 7 Blood's Creek watershed is about 9,605 acres and drains to the North Fork Stanislaus River. This watershed is located south of the ski area and contains Bear Valley Village. The principal scope for the analysis of watershed effects in this project was the portions of the HUC Level 7 watersheds present within the BVM SUP area.

### ***Wetlands***

A wetland and stream survey within the BVM SUP area was completed for the project area according to approved methodology. The survey area was limited to encompass only the disturbance areas associated with the proposed project activities under the Action Alternatives. Therefore, the entire SUP was not surveyed. Survey corridors around proposed disturbance area were extended approximately 100 to 150 feet outside of all proposed development areas (e.g., ski trails and lifts) to prevent potential impacts to wetlands and streams that are adjacent to proposed development areas.

The BVM project area contains several wetlands and streams. Several, small seep wetlands were observed on the south slopes along the proposed lift alignment and in the area known as East Bowl. These seeps contribute to stream flow in the unnamed tributary to Bear Lake, described below. Within the developed ski area, one wetland was observed in *Cub Meadow*, adjacent to the Super Cub lift. This wetland is largely within developed ski trails, and as a result it is routinely mowed in the fall to maintain low vegetation that does not interfere with skiing activities. A second wetland was observed by the RV parking lot and is likely the result of runoff from adjacent impervious surfaces.

### ***Streams***

In general, there are relatively few perennially flowing channels within the BVM SUP area due to the high elevation of the project area and snow-dominated hydrologic regime. Most drainages are ephemeral snowmelt channels that only realize flow for short periods of time in the spring and early summer months. Flows in these channels are highly dependent on winter snowpacks, which vary year to year. These drainage are conveyed into slightly larger first order channels at lower elevations within the SUP. The following channel summaries are the result of site specific fieldwork associated with the CWE analysis.

#### ***Snow Valley***

Snow Valley Creek lies entirely within the existing developed ski area. It originates at a seep to the east of the top terminal of Super Cub, and flows to the north (downslope) and eventually into the Mokelumne River. Snow Valley was divided into Upper and Lower reaches. The Upper Reach runs from the headwaters to the downstream end of the culvert adjacent to the ski area work road. The Lower Reach runs from the culvert to the point where the stream leaves the permit area.

The Upper Reach is altered from prior ski trail and work road construction. As a result, channel confinement is variable and consists of pockets of overland flow and narrow channels controlled by large boulders. Several work road crossings are present as fords. One culvert, about 200 feet long, contains the channels in the base area adjacent to the bottom terminals of Super Cub and Cub lifts. Gradients range from approximately 22% to 5% as the creek flows through the culvert. Perennial

flow is a minor component, estimated at 0.5 cubic foot per second. Low gradient segments of this reach are crowded by herbaceous vegetation which aids in filtering water.

The Lower Reach is a high energy transport channel with gradients exceeding 70% in places. Portions of this reach were not accessible due to the steepness of the terrain and were observed from above. The channel is primarily a step pool system controlled by boulders. Riparian vegetation is thick in this reach and dominated by willows. The willows provide good bank stability and shading for the length of the reach.

#### *Unnamed Reach 2*

This intermittent tributary flows into the western end of Bear Lake. During the field review, no flow was observed in this creek. However, in July of 2010 streamflow was observed by Forest Service watershed staff, owing to the variable flow characteristics of the stream. General observations of the channel indicated boulder/cobble beds and a series of step-pools coming off slopes to the north. Field observations were consistent with high gradient snowmelt channels typical of higher elevation first order streams. The upper segments of the creek have gradients exceeding 20%, which decrease to 5% as the creek enters Bear Lake. Contributing slopes in the headwaters are relatively undeveloped, non forested areas on public lands. At lower elevations, mature red fir forest is prevalent with some pockets of dense alders between Bear Lake and Bear Valley Road. Several houses and two road crossings are present where the creek enters private lands prior to flowing into Bear Lake.

#### *Unnamed Reach 3*

This perennial tributary originates at a slope seep and flows into the northern end of Bear Lake. Similar to Reach 2, this creek originates on largely non-forested slopes north of town and flows to the south through mature red fir forest. Perennial flows are relatively minor and estimated at 0.5 cubic feet per second or less. Seasonal precipitation and snowmelt contribute greater percentages of flow, as evidenced by visual observations of channel scour. Steeper gradients are present at the headwaters, exceeding 30%, and gradually decrease to 6% entering Bear Lake. Several segments of the channel are deeply incised and constrained by bedrock. Dominant substrate in the upper segments is cobble and gravels, with sands and gravels dominating lower segments adjacent to Bear Lake.

#### *Bear Creek*

Bear Creek is the outlet to Bear Lake and is controlled by an earthen dam and overflow spillway. As a result, flow in the creek is regulated and was intermittent during the field review. Minor flows, estimated at less than 0.5 cubic feet per second, were observed just below the dam and extend several hundred yards downstream. From that point, no flow was observed in the remainder of the creek. Residential development is prevalent along the creek between the dam and Highway 4. Areas of unstable banks were observed and are likely the result of high flows during snowmelt, or when Bear Lake reaches capacity. Some areas of eroded bank are likely remnants from historic peak flow regimes that existed prior to the construction of the Bear Lake dam. Pockets of sands and fine sediments are present in the dry bed and are indicative of depositional areas during periods of flow. Cobbles are the dominant substrate feature observed during surveys.

#### *Riparian Conservation Areas*

Riparian Conservation Areas (RCAs) were established by the Sierra Nevada Forest Plan Amendment as means to consistency with the Riparian Conservation Objectives (RCO) of the forest plan. RCAs are established according to the conditions described in Table 3-14.

Table 3-14: Riparian Conservation Areas (RCAs) Adjacent to Aquatic Features

| Aquatic feature                                                                                                                                                                                 | Riparian Conservation Area <sup>a</sup>                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Perennial stream                                                                                                                                                                                | 300 feet on each side of the stream, measured from the bank full edge of the stream                   |
| Seasonally flowing streams (includes intermittent and ephemeral streams).                                                                                                                       | 150 feet on each side of the stream, measured from the bank full edge of the stream.                  |
| Special aquatic features (includes lakes, wet meadows, bogs, fens, wetlands, vernal pools, and springs).                                                                                        | 300 feet from the edge of the features or riparian vegetation, whichever width is greater.            |
| Perennial streams with riparian conditions extending more than 150 feet from the edge of the streambank or seasonally flow streams extending more than 50 feet from the edge of the streambank. | 300 feet from the edge of the features or riparian vegetation, whichever width is greater.            |
| Streams in inner gorge                                                                                                                                                                          | Top of inner gorge. (The inner gorge is defined by stream adjacent slopes greater than 70% gradient.) |

<sup>a</sup> Riparian Conservation Areas (RCAs) are designated on page 42 of the Sierra Nevada Forest Plan Amendment Record of Decision of 2004; RCOs are described on pages 33 and 34.

**Water Quality**

The Porter-Cologne Water-Quality Act, as amended in 2006, is included in the California Water Code. This act provides for the protection of water quality by the state Water Resources Control Board and the regional water quality control boards, which are authorized by the U.S. Environmental Protection Agency to enforce the Clean Water Act in California. Water quality on the forest is principally managed through the Water Quality Control Plan (Basin Plan) of the California Regional Water Quality Control Board, Central Valley Region. This plan establishes Beneficial Uses of Water and describes Water Quality Objectives for meeting beneficial uses.

*Beneficial Uses of Water*

The Stanislaus and Mokelumne Rivers have established beneficial uses of water. These uses are municipal and domestic supply, contact and non-contact recreation, warm and cold water freshwater habitat, and wildlife habitat.

Beneficial uses relevant to humans and aquatic wildlife within the forest are contact and non-contact recreation (e.g., swimming, angling), freshwater habitat (cold and warm water fisheries), and wildlife (amphibian and aquatic reptile species). All of the streams in the watersheds where projects are intended have these beneficial uses as they contribute to downstream effects in the larger watersheds (i.e., HUC 5).

*Water Quality Objectives*

Water quality objectives are limits of constituents in water that are intended to provide reasonable protection of beneficial uses of water. The Basin Plan contains objectives for numerous water quality constituents, or parameters. The water quality parameter most likely to be affected by the proposed action is sediment, which contributes to instream turbidity. Sediment generation can occur as a result of erosion that occurs on non-vegetated ski slopes or proposed areas of grading that occurs in close proximity to streams or wetlands. The measure of the water quality objective for this pollutant is that sediment "...shall not be altered so as to cause nuisance or adversely affect beneficial uses." As described previously, most streams within the project are ephemeral or intermittent, therefore direct measurement of sediment during surveys was not practical. Additionally, these channels are typically first order streams with high gradients and high energy, which limits the depositional functions of the channel.

Water temperature is another parameter considered relevant to this project. It can be elevated by openings along streams, including those created by ski trails and other ski area facilities. The measure of this water quality objective is that water temperature "...shall not be altered unless it...does not adversely affect beneficial uses, and...at no time or place be increased more than 5° Fahrenheit above natural receiving water temperature." Since the project area occurs within an area dominated by snowpack and snowmelt cycles and there are few perennial streams, proposed project activities are not expected to influence water temperatures. Water temperatures would continue to be heavily reliant upon air temperatures and the quantity and rate of snow melt.

Petrochemical products in water (e.g., oil or grease) are also considered relevant to this project since they have the potential to cause nuisance or adversely affect beneficial uses. These pollutants can be produced as a byproduct of construction vehicles during normal operation or in the event of a spill.

Water quality currently meets beneficial uses of water at the larger HUC watershed scale for the Stanislaus and Mokelumne Rivers. No impaired waters exist on the Forest. The Environmental Protection Agency lists such waters as a requirement of Section 303d of the Federal Clean Water Act. None of the four major rivers on the Stanislaus National Forest are listed.

Observations by Forest Service watershed staff over the past several years indicate water quality is very good in the North Fork Mokelumne and North Fork Stanislaus rivers, which are the receiving waters from the project area. Minimal instream sediment exists, water temperature is suitable for beneficial uses and no apparent petrochemical issues are present. Riparian vegetation along Bloods creeks as well as the headwaters of the North Fork Mokelumne River is abundant and the streams are stable at the HUC Level 7 scale.

## **ENVIRONMENT CONSEQUENCES**

### ***Direct and Indirect Effects***

#### ***Alternative 1 (No Action)***

Under Alternative 1, there would be no new direct impacts to watershed resources, including streams and wetlands. BVM would continue to operate and maintain the existing developed ski terrain, which includes mowing ski trails with wetlands. Beneficial uses would continue to be met at present.

#### ***Alternative 2 (Proposed Action)***

##### **Wetlands**

Under the Alternative 2 (Proposed Action), proposed project activities would avoid direct impacts to wetlands to the greatest extent possible. The only projects proposed that could potentially impact wetlands are the replacement of Super Cub and trail grading on *Water Tank*. All other proposed projects would have no impact on wetlands as they are located away from known wetlands.

The proposed replacement of the Super Cub chairlift could potentially impact the wetland in *Cub Meadow* through ground-disturbing activities. Currently, the existing chairlift passes through this wetland and three towers are located within the wetland boundary. The proposed replacement would move the bottom terminal about 75 feet to the north, downslope, and away from the wetland boundary. This terminal would be situated on an existing work road. The proposed Super Cub may require the placement of one new tower within the wetland; however this cannot be determined until final engineering of the lift is completed. The engineering would determine if the wetland can be spanned without placing a tower in the wetland. For purposes of this analysis, it is assumed that one tower, assuming a six foot by 6-foot disturbance footprint, would be constructed in the wetland. In order to protect the wetland from ground disturbance by mechanized equipment, excavation for the foundation would occur over snow by a tracked excavator. Concrete would be poured either by a long-arm pump truck or flown in by helicopter to minimize equipment access in the wetland. The tower would be flown in and bolted to the foundation after the concrete cures. The existing lift towers

would be unbolted from the foundations and removed from the wetland. The existing foundations would be left in place. Due to the limited extent of the disturbance (i.e., 6-foot square footprint) and implementation of the mitigation measures discussed above, it is expected that the replacement of the Super Cub chairlift will not adversely impact the overall and long-term functioning of the wetland.

A small wetland occurs at the end of proposed grading for *Bono's Alley/Water Tank*. Prior to project implementation, project boundaries (e.g., clearing/grading limits) would be flagged in the field. These boundaries would be "field-fit" and routed to avoid the wetland. Erosion and sediment control best management practices (BMPs), such as perimeter sediment control (straw wattles, silt fence) would be incorporated into construction practices to reduce sediment delivery to the wetland. Additionally, proposed ground disturbing activities would occur during dry periods to minimize the potential for erosion.

#### Streams

Under Alternative 2 (Proposed Action), there is one proposed intermittent stream crossing associated with the *Home Run/Lunch Run* trail improvements. No other project activities would have any impacts to stream channels. The crossing would be constructed by a skier bridge designed to span the stream channel. No ground disturbance would occur below the ordinary high water mark on either side of the channel. Construction would occur in the summer months when the channel is naturally de-watered. Erosion control measures, e.g., silt fence or wattles, would be placed above ordinary high water to control sediment movement during rain events and site stabilization.

#### Water Quality

Under Alternative 2 (Proposed Action), proposed project activities are not expected to measurably impact water quality. As discussed previously, many of the drainages are seasonal snow melt channels. To minimize potential impacts to downstream water quality, proposed ground disturbing activities would occur during the dry months to reduce potential sediment delivery and subsequent increases in downstream turbidity. Additionally, equipment would not be allowed to operate within dry channels. A spill kit would also be kept onsite to contain and clean-up any accidental petroleum spills or leaks. As a result of implementing mitigation measures and BMPs, the Alternative 2 (Proposed Action) would not adversely affect downstream water quality or existing beneficial uses on the Mokelumne and Stanislaus Rivers.

#### *Alternative 3 (Improved Skier Circulation)*

The effects are the same as those for Alternative 2.

#### **Cumulative Effects**

The process for analyzing cumulative watershed effects (CWE) for the BVM expansion project consisted of two steps: (1) an Equivalent Roded Acres (ERA) analysis to assess the risk of cumulative effects, and (2) field evaluation of selected streams within the project area. The following cumulative effects analysis is excerpted from a technical report that was prepared for this project. The full technical report is contained in the project file.

The project area is located within two 7th field watersheds, Blood's Creek and Mattley Creek. The Mattley Creek watershed is about 16,800 acres in size and drains northerly to the Mokelumne River. The majority of the existing ski area development falls within this watershed. Blood's Creek watershed is about 9,605 acres and drains southerly to the North Fork Stanislaus River. This watershed is located south of the ski area and contains Bear Valley Village. Additionally, sub 7th field drainages for each watershed were also identified for evaluation.

#### *Equivalent Roded Area Analysis*

The risk of cumulative effects was evaluated using the equivalent roded area (ERA) methodology developed by the Forest Service (USDA 1988). The ERA model is intended to predict risk of

cumulative effects, not actual effects. As such, it is intended to be an initial screen for focusing field evaluation priorities.

The ERA spreadsheet model utilizes four input parameters; Proposed Action, Future Activities, Previous Activities, and Constant Features. Each parameter is designed with formulas to calculate the percent (ERA for different projects. The Annual ERA value is calculated using a linear decay of the ERA coefficient. The basic equation is:

$$\text{ERA} = \text{Acres} * (\text{ERACoef} - ((\text{Year} - \text{Activity Year} / \text{Recovery}) * \text{ERACoef}))$$

However, if the activity is in the future, no ERA would be calculated until the first year of the activity. Also, if Year-Activity Year is greater than or equal to the Recovery, then the Annual ERA is zero because the recovery time is exceeded. Hence the inclusion of an “IF” function in the Annual ERA equation.

For purposes of this analysis, the following assumptions were made for each parameter to complete the ERA calculations.

- Previous Activities and Future Activities – information on past management and known future activities was obtained for each watershed.
- Constant Features – known features within each watershed were obtained from existing GIS data sources, or digitized from existing aerial photography. Existing ski trails at BVM were also evaluated in ERA. For purposes of this analysis, it was assumed that a developed ski trail has an ERA coefficient of 0.5.

The following tables present the results of the ERA analysis for each Alternative, by watershed and sub-watershed.

The results of the ERA analysis indicate a low risk of potential cumulative effects in all of the watersheds analyzed for both action alternatives. The threshold of concern (TOC) is between 10 and 12% for the Mattley Creek watershed, and 12 to 14% for the Blood’s Creek watershed. Constant features, such as the existing ski area development and Town of Bear Valley, heavily influence the ERA of each watershed. At the 7th field scale, both watersheds are well below the TOC for both action alternatives: Mattley Creek watershed has the same maximum ERA of 2.69% for both the Proposed Action and Alternative 3; Blood’s Creek watershed has maximum ERA’s of 4.06% in Alternative 3 and 4.04% in the Proposed Action. At the sub 7th field scale, both watersheds are still below the TOC for both action alternatives, although the existing ski area development (7.9%) is a major contributor to the higher ERA calculations in the Mattley Creek watershed (8.77% overall, Proposed Action and Alternative 3); sub 7th field Blood’s Creek has maximum ERA’s of 2.79% in Alternative 3 and 2.73% in the Proposed Action.

#### *Field Review of Streams*

The results of the ERA analysis indicate that the Mattley Creek and Blood’s Creek 7th field watershed are at relatively low risk of cumulative watershed effects as both watersheds are well below the threshold of concern. Field review of selected streams confirms the low risk of cumulative effects. The two tributaries to Bear Lake are indicative of higher elevation first order streams and are heavily influenced by snowmelt processes. Similarly, Bear Creek is regulated by controlled flows from Bear Lake, and inputs from residential development in the Town of Bear Valley. Snow Valley Creek, while altered through prior ski area development activities, shows indications of stability demonstrated by dense riparian vegetation on steeper slopes.

The proposed BVM Expansion projects include ground disturbing activities that can produce sediment that is conveyed downstream. In an effort to reduce both potential onsite and downstream impacts from these activities, mitigation measures and BMPs have been included in Section 2.2 (Chapter 2).

Table 3-15: Sub-7th Field Mattley Creek Watershed

|                                              |                |      |      |      |      |      |      |      |      |      |
|----------------------------------------------|----------------|------|------|------|------|------|------|------|------|------|
| Watershed Number:                            | 18040012010601 |      |      |      |      |      |      |      |      |      |
| Size (acres):                                | 3305           |      |      |      |      |      |      |      |      |      |
| Threshold of Concern:                        | 10–12% ERA     |      |      |      |      |      |      |      |      |      |
| <b>Annual Percentage ERA per Feature</b>     |                |      |      |      |      |      |      |      |      |      |
|                                              | 2010           | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Proposed Action (Alt. 2)                     | 0.58           | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 |
| Alternative 3 (Improved Skier Circulation)   | 0.58           | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 |
| Other Current and Future Activities          | 0.00           | 0.00 | 0.11 | 0.29 | 0.27 | 0.24 | 0.21 | 0.18 | 0.15 | 0.11 |
| Previous Activities                          | 0.00           | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Constant Features                            | 7.90           | 7.90 | 7.90 | 7.90 | 7.90 | 7.90 | 7.90 | 7.90 | 7.90 | 7.90 |
| <b>Annual Percentage ERA per Alternative</b> |                |      |      |      |      |      |      |      |      |      |
|                                              | 2010           | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Alternative 1 (No Action)                    | 7.90           | 7.90 | 8.01 | 8.19 | 8.17 | 8.14 | 8.11 | 8.08 | 8.05 | 8.01 |
| Alternative 2 (Proposed Action)              | 8.48           | 8.48 | 8.59 | 8.77 | 8.75 | 8.72 | 8.69 | 8.66 | 8.62 | 8.59 |
| Alternative 3 (Improved Skier Circulation)   | 8.48           | 8.48 | 8.59 | 8.77 | 8.75 | 8.72 | 8.68 | 8.66 | 8.62 | 8.59 |

Table 3-16: 7th Field Mattley Creek Watershed

|                                              |                |      |      |      |      |      |      |      |      |      |
|----------------------------------------------|----------------|------|------|------|------|------|------|------|------|------|
| Watershed Number:                            | 18040012010601 |      |      |      |      |      |      |      |      |      |
| Size (acres):                                | 16,800         |      |      |      |      |      |      |      |      |      |
| Threshold of Concern:                        | 10–12% ERA     |      |      |      |      |      |      |      |      |      |
| <b>Annual Percentage ERA per Feature</b>     |                |      |      |      |      |      |      |      |      |      |
|                                              | 2010           | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Proposed Action (Alt. 2)                     | 0.11           | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| Alternative 3 (Improved Skier Circulation)   | 0.11           | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| Other Current and Future Activities          | 0.00           | 0.00 | 0.02 | 0.06 | 0.05 | 0.05 | 0.71 | 0.69 | 0.61 | 0.52 |
| Previous Activities                          | 0.06           | 0.05 | 0.05 | 0.04 | 0.03 | 0.02 | 0.02 | 0.01 | 0.00 | 0.00 |
| Constant Features                            | 1.85           | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 |
| <b>Annual Percentage ERA per Alternative</b> |                |      |      |      |      |      |      |      |      |      |
|                                              | 2010           | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Alternative 1 (No Action)                    | 1.91           | 1.90 | 1.92 | 1.95 | 1.93 | 1.92 | 2.58 | 2.55 | 2.46 | 2.36 |
| Alternative 2 (Proposed Action)              | 2.02           | 2.02 | 2.03 | 2.06 | 2.05 | 2.03 | 2.69 | 2.66 | 2.57 | 2.48 |
| Alternative 3 (Improved Skier Circulation)   | 2.02           | 2.02 | 2.03 | 2.06 | 2.05 | 2.03 | 2.69 | 2.66 | 2.57 | 2.48 |

Table 3-17: Sub-7th Field Blood's Creek Watershed

|                                              |                |      |      |      |      |      |      |      |      |      |
|----------------------------------------------|----------------|------|------|------|------|------|------|------|------|------|
| Watershed Number:                            | 18040010010103 |      |      |      |      |      |      |      |      |      |
| Size (acres):                                | 4,775          |      |      |      |      |      |      |      |      |      |
| Threshold of Concern:                        | 12–14% ERA     |      |      |      |      |      |      |      |      |      |
| <b>Annual Percentage ERA per Feature</b>     |                |      |      |      |      |      |      |      |      |      |
|                                              | 2010           | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Proposed Action (Alt. 2)                     | 0.43           | 0.42 | 0.42 | 0.41 | 0.41 | 0.41 | 0.41 | 0.41 | 0.41 | 0.41 |
| Alternative 3 (Improved Skier Circulation)   | 0.48           | 0.48 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 |
| Other Current and Future Activities          | 0.00           | 0.00 | 0.08 | 0.20 | 0.19 | 0.17 | 0.14 | 0.13 | 0.10 | 0.08 |
| Previous Activities                          | 0.00           | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Constant Features                            | 2.12           | 2.12 | 2.12 | 2.12 | 2.12 | 2.12 | 2.12 | 2.12 | 2.12 | 2.12 |
| <b>Annual Percentage ERA per Alternative</b> |                |      |      |      |      |      |      |      |      |      |
|                                              | 2010           | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Alternative 1 (No Action)                    | 2.12           | 2.12 | 2.19 | 2.32 | 2.31 | 2.29 | 2.26 | 2.24 | 2.22 | 2.19 |
| Alternative 2 (Proposed Action)              | 2.55           | 2.54 | 2.61 | 2.73 | 2.72 | 2.70 | 2.67 | 2.66 | 2.63 | 2.61 |
| Alternative 3 (Improved Skier Circulation)   | 2.60           | 2.60 | 2.67 | 2.79 | 2.78 | 2.75 | 2.73 | 2.71 | 2.69 | 2.66 |

Table 3-18: 7th Field Blood's Creek Watershed

|                                              |                |      |      |      |      |      |      |      |      |      |
|----------------------------------------------|----------------|------|------|------|------|------|------|------|------|------|
| Watershed Number:                            | 18040010010103 |      |      |      |      |      |      |      |      |      |
| Size (acres):                                | 9,605          |      |      |      |      |      |      |      |      |      |
| Threshold of Concern:                        | 12–14% ERA     |      |      |      |      |      |      |      |      |      |
| <b>Annual Percentage ERA per Feature</b>     |                |      |      |      |      |      |      |      |      |      |
|                                              | 2010           | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Proposed Action (Alt. 2)                     | 0.21           | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 |
| Alternative 3 (Improved Skier Circulation)   | 0.24           | 0.24 | 0.24 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| Other Current and Future Activities          | 0.01           | 2.20 | 2.27 | 2.03 | 1.73 | 1.72 | 1.33 | 0.95 | 0.72 | 0.48 |
| Previous Activities                          | 0.01           | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Constant Features                            | 1.56           | 1.56 | 1.56 | 1.56 | 1.56 | 1.56 | 1.56 | 1.56 | 1.56 | 1.56 |
| <b>Annual Percentage ERA per Alternative</b> |                |      |      |      |      |      |      |      |      |      |
|                                              | 2010           | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Alternative 1 (No Action)                    | 1.60           | 3.77 | 3.83 | 3.58 | 3.29 | 3.28 | 2.88 | 2.50 | 2.27 | 2.04 |
| Alternative 2 (Proposed Action)              | 1.82           | 3.98 | 4.04 | 3.79 | 3.49 | 3.48 | 3.09 | 2.71 | 2.48 | 2.24 |
| Alternative 3 (Improved Skier Circulation)   | 1.84           | 4.01 | 4.06 | 3.82 | 3.52 | 3.51 | 3.12 | 2.74 | 2.50 | 2.27 |

## Recreation

**Issue: Proposed lift upgrades and installations, combined with new and improved trails, have potential to increase densities on specific beginner, novice and intermediate terrain.**

The scope of this recreation analysis encompasses the BVM SUP boundary and adjacent private lands in Bear Valley Village (only as related to how the ski area interfaces with the Village). Proposed parking, trails, lifts and facilities are discussed, as they relate to the overall quality of the recreational experience at BVM.

### Affected Environment

#### LIFT NETWORK

BVM maintains eight chairlifts (one four-person, two three-person, and five two-person chairs) and one surface conveyor. These lifts are summarized below in Table 3-19. There is currently no lift access between Bear Valley Village and BVM.

Currently, four lifts provide access to beginner and novice terrain in Bunny Basin. The lift/terrain progression in Bunny Basin typically includes: Panda Carpet, followed by the Cub chairlift, then Super Cub, and finally the Koala chairlift. However, Bunny Basin is inefficiently utilized because terrain is currently served by low capacity lifts that are difficult for low-level skiers and riders to load and unload. For example, the Cub chairlift is difficult for beginners to load and unload, and it is inefficient to operate. Therefore, BVM does not operate this lift full time. In addition, the bottom terminal of the Super Cub chairlift is positioned too far from base area facilities, requiring beginner and novice skiers/riders to walk uphill to reach it, which is not an ideal teaching/learning environment. These factors are restrictive in terms of BVM meeting the needs of teaching “first-timers” and children.

Table 3-19: Lift Specifications – Existing Conditions

| Lift Name     | Lift Maker/<br>Year Installed | Vertical<br>Rise<br>(ft.) | Slope<br>Length<br>(ft.) | Hourly<br>Capacity<br>(people/hr) |
|---------------|-------------------------------|---------------------------|--------------------------|-----------------------------------|
| Panda         | Kaiser                        | 20                        | 300                      | 720                               |
| Super Cub     | Riblet/1970                   | 253                       | 1,524                    | 1,100                             |
| Cub           | Riblet/1967                   | 204                       | 1,521                    | 1,200                             |
| Bear          | Riblet/1967                   | 721                       | 3,096                    | 1,200                             |
| Grizzly       | Riblet/1967                   | 1267                      | 3,236                    | 1,200                             |
| Koala         | Riblet/1968                   | 500                       | 1,816                    | 1,200                             |
| Kuma          | Yan/1981                      | 733                       | 3,065                    | 1,800                             |
| Polar Express | Poma/2006                     | 953                       | 4,468                    | 2,400                             |
| Pooh Bear     | Yan/1981                      | 745                       | 2,825                    | 1,800                             |

#### TERRAIN NETWORK

BVM has a base elevation of about 6,600 feet with lift access to about 8,500 feet. BVM offers about 511 acres of developed, lift-served terrain, which is found on the Front Side/Back Side/Lower Mountain. For the purposes of this analysis, undeveloped terrain on the south side of the SUP area (i.e., the “Village Side”) is discussed separately.

### **Front Side/Back Side/Lower Mountain Terrain**

Based on a terrain distribution analysis that was completed for this EA, when compared to its skiers/rider market, BVM currently has an abundance of expert terrain; relatively balanced intermediate, novice and advanced intermediate terrain; and a deficit of beginner and low-intermediate terrain.<sup>12</sup> The existing lift-served terrain network generally meets the needs of BVM's guests, with some notable exceptions, detailed below. The following information is consistent with the Purpose and Need in Chapter 1.

#### **Skier/Rider Circulation**

The Kuma and Bear chairlifts provide out-of-base access to intermediate to advanced terrain at Bear Top. Novice and low-intermediate skiers/snowboarders who choose to ride these two lifts to Bear Top have two options for returning to the base area: *Mokelumne West* or Tuck's *Traverse/Bono's Alley/Water Tank*.<sup>13</sup>

The primary trail from Bear Top down to the base area is *Mokelumne West* (an intermediate trail). However, *Mokelumne West* typically has moguls and is relatively steep and narrow in sections, which is intimidating to lower-level guests. Therefore, in its current state, *Mokelumne West* is not suitable for novice to low intermediate skiers/snowboarders because it requires navigation of terrain that is above their ability/comfort levels. All the lower-level skiers are funneled onto *Mokelumne West*, which leads to congestion and degrades the recreational experience. *Tuck's Traverse* extends from Bear Top to Koala Top and requires skiers/snowboarders to travel long, relatively flat stretches (e.g., less than 5% slopes). This makes the trail unsuitable for low ability level guests and snowboarders as they are required to maintain higher speeds, use ski poles to push themselves, or simply walk across the flat sections.

#### **Mix of Skier/Boarder Abilities**

The main base area offers all of BVM's guest services (e.g., rental, ticketing, food and beverage), with the exception of on-mountain restrooms on Bear Top. Therefore, particularly during the mid-day lunch time and afternoon closing time, intermediate through expert skiers/riders utilizing the Pooh Bear and Polar Express pods on the "Back Side" of the mountain end up descending through beginner and novice terrain in Bunny Basin to reach the base area for guest services. This results in a mixing of ability levels that detracts from the recreational experience and is intimidating for lower-level skiers/snowboarders.

#### **Village Side Terrain**

Approximately 500 acres of non-lift-served terrain exist on the south side of the SUP area, between the main part of the ski area and Bear Valley Village (Figure 2, map package). This Village Side terrain is composed of two distinct bowls (Sunrise Bowl and Dardanelle Vista Bowl), glades and over a dozen named runs. This terrain ranges in ability level from intermediate through expert—there is no low-intermediate, novice or beginner terrain on the Village Side. None of this terrain is lift-served, and guests who choose to enter the Village Side terrain rely on a BVM shuttle to return to the ski area (hence the name "bus runs"). The Village Side Terrain is patrolled, with *Home Run* and *Lunch Run* groomed periodically.

Particularly on new snow days, bus runs are popular, with some guests repeat skiing two or three times. Bus runs tends to decrease as conditions change with solar exposure and warming temperatures.

<sup>12</sup> This is based on BVM's market compared to industry norms.

<sup>13</sup> When BVM installed the Polar Express (an upgrade of the Hibernation chairlift) it increased the popularity of the backside of the mountain and as a result, more intermediates (and in some cases, novices) use the "Backside" terrain than in the past.

**RESORT CAPACITY**

As defined in Chapter 2, Comfortable Carrying Capacity (CCC) is defined as a level of visitation for a resort that provides a pleasant recreational experience, without overburdening the resort infrastructure. CCC does not indicate a maximum level of visitation, but rather the optimal number of visitors that can be “comfortably” accommodated on a daily basis. The existing CCC at BVM is calculated at 4,690 people.

**GUEST SERVICES**

The main base area offers the majority of skier/boarder services (e.g., rental, ticketing, food and beverage) and facilities (e.g., base area lodge), with the exception of restrooms on Bear Top. Access to the base area guest services is discussed previously.

**PARKING**

The parking lots at BVM serve the day-skier/boarder population. The ski area operates a shuttle bus service on an hourly basis (on the half hour during weekends) transporting residents and guests from the Village to the ski area. This shuttle helps to reduce the parking demands at the ski area coming from guests staying or residing in Bear Valley Village. Existing parking capacities at BVM are displayed in Table 3-20.

As displayed in Table 3-20, BVM can accommodate 3,849 guests based on its parking capacity. However, based on its CCC of 4,690 guests, it has a parking deficit. This can result in congestion (particularly on a handful of days over the holiday period), which affects the recreational experience at the ski area by interrupting the arrival experience and necessitating additional driving and shuttle trips for guests.

When parking becomes overtaxed (i.e., on peak days) the closest location to accommodate overflow parking is in public parking lots in Bear Valley Village. This overflow situation can exacerbate the current parking shortage for the residents, guests and patrons in the Village.

Table 3-20: Existing Parking at BVM

| Lot #        | Lot Name  | Area (acres) | Car Capacity | Skier/boarder Capacity <sup>a</sup> |
|--------------|-----------|--------------|--------------|-------------------------------------|
| 1            | Bus Lot   | 1.7          | 130          | 286                                 |
| 2            | RV Lot    | 1.3          | 125          | 275                                 |
| 3            | Upper Rd. | 4.2          | 376          | 827                                 |
| 4            | Lower Rd. | 5.6          | 746          | 1,641                               |
| 5            | Preferred | 1.5          | 240          | 528                                 |
|              | Overflow  | 0.8          | 133          | 292                                 |
| <b>Total</b> |           | <b>15.1</b>  | <b>1,750</b> | <b>3,849</b>                        |

<sup>a</sup> Calculated as AVO multiplied by number of cars

**Environment Consequences**

**DIRECT AND INDIRECT EFFECTS**

**Alternative 1 (No Action)**

Under Alternative 1, average annual visitation at BVM would be around 130,000 with potential further declines in the absence of capital improvements at BVM combined with terrain and capital projects at nearby Lake Tahoe area resorts.

BVM would continue to operate eight chairlifts and one surface lift. The existing terrain at BVM would be maintained, including about 466 acres of lift-served terrain on the Front Side/Back Side/Lower Mountain, and roughly 500 acres of non-lift-served terrain on the Village Side of the SUP area. No new projects would be proposed or implemented. Any future lift replacements or trail development would require project-specific approval from the Forest Service and appropriate regulatory agencies.

The quality of the recreational experience would continue to be limited by a deficit of beginner and low intermediate terrain. Lower level skiers/snowboarders descending to the base area from Bear Top on *Mokelumne West* and *Tuck's Traverse/Bono's Alley/Water Tank* would be required to negotiate terrain that is inappropriate for their ability/comfort level.

No new on-mountain facilities would be built under Alternative 1. Therefore, more advanced skiers and riders using Back Side terrain (Pooh Bear and Polar Express) would need to descend to the base area for basic guest services. This would often entail descending through Bunny Basin, which equates to mixing of ability levels—at both the lunchtime and end-of-day egress periods.

There would continue to be a lack of a lift connection between Bear Valley Village and BVM, and therefore, “bus runs” would continue. Terrain on the Village Side of the ski area would continue to accommodate intermediate through expert skiers and riders—there would be no low-intermediate or novice route to Bear Valley Village.

BVM would be expected to continue to experience parking congestion during peak visitation periods.

### ***Alternative 2 (Proposed Action)***

Implementation of the projects contained in Alternative 2 would be installed over a number of years due to fiscal realities and a short construction season. Therefore, in the long-term, implementation of Alternate 2 could potentially enable BVM to recapture some of the annual visitation it experienced in the 1980s, but has since lost due to the lack of terrain and capital improvements. However, as with any ski area, this is dependent upon many external factors beyond capital/terrain improvements, including economic trends and snowfall.

Because increased visitation directly equates to increased revenues, recapturing some of this annual visitation would make BMV more economically viable in the long term.

#### *Lift Network*

Under Alternative 2, BVM's lift network would remain as-is, with two exceptions, discussed below.

#### *Super Cub*

By increasing its hourly capacity, the proposed replacement of the Super Cub chairlift would improve access to Bunny Basin for beginner skiers/snowboarders. This would decrease lift lines, and increase trail densities. As noted in the Proposed Action description (Chapter 2), upgrading the Super Cub chairlift to a detachable would allow BVM to further scale back use of the Cub chairlift, which is inefficient and difficult to load/unload for beginners. The relocated Super Cub chairlift bottom terminal would be closer to base area facilities and would thereby minimize walking distances for lower-level guests, creating more pleasant teaching/learning conditions, as compared to existing conditions. This upgrade would improve lift efficiency, decrease lift lines, improve access to beginner and novice terrain, and would thereby benefit the recreational experience for low-level skiers/riders.

From a skier/rider circulation perspective, there are acknowledged consequences of upgrading the Super Cub chairlift to a high-speed quad and scaling back use of Cub. These are discussed under “Terrain Network,” below.

The Village Lift

The proposed Village Lift would enable direct lift service from Bear Valley Village to the BVM (the top terminal would unload at Koala Rocks). Repeat-use of Dardanelles Vista Bowl or Sunrise Bowl could be accomplished should guests be willing to descend all the way to the Village (on existing and proposed trails) and ride the lift again. In fact, for all practical purposes, the skiing/riding experience on the Village Side would remain largely as-is, because the bottom terminal of the proposed Village Lift would require guests to negotiate roads and flat slopes within Bear Valley Village to reach the bottom terminal, which is located close to where buses currently pick them up. However, the proposed Village Lift would represent a tangible improvement over the existing conditions, as BVM guests and Bear Valley Village residents would be able to descend all the way to Bear Valley Village for lunch and return to the ski area without having to rely on a shuttle to return to the ski area.

*Terrain Network*

The terrain breakdown under Alternative 2 is compared to the existing conditions in Table 3-21.

Front Side/Back Side/Lower Mountain Terrain

Under Alternative 2, skier/rider access to, and circulation throughout, BVM’s Front Side/Back Side/Lower Mountain terrain is anticipated to remain similar to the existing conditions. Exceptions are noted below.

Alternative 2 would add about 11 acres to BVM’s lift-served terrain network (from 466.5 to 477.4). Just less than 8 acres are attributable to the addition of The *Village Skiway* (on the Village Side) to the lift-served terrain network; the rest is attributable to the proposed *Mokelumne West Bypass* on the Front Side. Note that low-intermediate and intermediate terrain decreases between the existing conditions and Alternative 2. The differences are attributable to proposed terrain recontouring on portions of *Bono’s Alley* and *Water Tank* that would change the classification of these intermediate/low-intermediate trails to novice. That being said, the roughly 21 acres of additional novice terrain are attributable to both proposed recontouring of existing terrain (*Bono’s Alley* and *Water Tank*), the addition of the *Mokelumne West Bypass*, as the well as reclassification of The *Village Skiway* from intermediate to novice.

Table 3-21: Terrain Breakdown – Alternative 2 Compared to Existing Conditions

|                                                     | Terrain Classification           | Existing Conditions Trail Area (acres) | Alternative 2 Trail Area (acres) |
|-----------------------------------------------------|----------------------------------|----------------------------------------|----------------------------------|
| <b>Lift Served Terrain</b>                          | Beginner                         | 1.6                                    | 1.6                              |
|                                                     | Novice                           | 28.9                                   | 50.1                             |
|                                                     | Low Intermediate                 | 58.7                                   | 52.3                             |
|                                                     | Intermediate                     | 73.9                                   | 70.1                             |
|                                                     | Adv. Intermediate                | 65.1                                   | 65.1                             |
|                                                     | Expert                           | 238.3                                  | 238.3                            |
|                                                     | <b>Total Lift-Served Terrain</b> |                                        | <b>466.5</b>                     |
| <b>Non-Lift-Served (i.e., Village Side) Terrain</b> |                                  | <b>500</b>                             | <b>492.3</b>                     |

Skier/Rider Access from Bear Top to the Base Area

By providing an alternate route around steeper sections of *Mokelumne West*, the proposed *Mokelumne West Bypass* would divert lower level skiers and riders away from *Mokelumne West*. This would

separate the novice from low-intermediate (and above) skiers and riders that currently affects circulation on this popular trail, improving the recreational experience for all levels.

#### Access to the Base Area from Koala Top

An acknowledged consequence of installing the proposed Village Lift is that *Bono's Alley* and *Water Tank* would be expected to experience increased congestion as well mixing of ability levels. This stems from the location of the proposed top terminal of the Village Lift—at Koala Rocks—which would effectively limit unloading guests' options for descending to the base area to *Bono's Alley*, followed by *Water Tank*. Therefore, recontouring and widening of *Bono's Alley* and *Water Tank* is necessary under the Proposed Action.

The increased use of *Bono's Alley* and *Water Tank* would be composed of all ability levels of skiers and riders using the Village Lift from Bear Valley Village. By strategically recontouring and widening these trails to accommodate more use than they currently receive, the recreational experience in the Koala pod is anticipated to be maintained. For example, skiers/snowboarders descending *Hog Back* would find the experience relatively unchanged, as widening would occur on the *Bono's Alley* and *Water Tank* side of the tree islands that separate them from *Hog Back*.

#### Access to Cub Meadow from the Super Cub Chairlift

Upgrading Super Cub to a detachable lift would put more beginner skiers/snowboarders onto *Rodeo* and *Ego Alley* (both of which are novice trails). In conjunction with scaling back the use of the Cub chairlift, this could make it more difficult for beginner skiers/riders to access *Cub Meadow*, which is beginner-level terrain. Therefore, about 1 acre of strategic recontouring on upper *Ego Alley* is designed to accommodate access to *Cub Meadow* from the top of the Super Cub chairlift for beginner skiers and riders.

Second, Bunny Basin is already a busy area that often experiences mixing of ability levels, which stems from more advanced skiers and riders descending through it en route to the base area from higher elevation terrain (e.g., *Groovy Gully*). Scaling back use of Cub and putting more beginners on Super Cub and upper *Ego Alley* has potential to exacerbate this situation. Therefore, regardless of whether Cub is in operation, under the Proposed Action, BVM would employ a mix of staffing, fencing and signage to help manage this situation. The intent would be to reduce the mixing of ability levels (i.e., beginners/novices using terrain in Bunny Basin and higher ability level skiers/riders descending through Bunny Basin from).

#### Village Side Terrain

Technically, all of the terrain on the Village Side would be served by the proposed Village Lift. However, from a practical perspective, only The *Village Skiway* would become truly lift-served, as it is the only trail that directly leads to the bottom terminal of the proposed Village Lift (i.e., all terrain on the Village Side of the ski area would become “lift-served”)—the distinction being that not much of it would be *easily* or *directly* lift-served. Therefore, in spite of the installation of the Village Lift, the Village Side terrain—and the recreational experience afforded there—would essentially remain as in the No Action Alternative, with some notable exceptions (explained below).

Under Alternative 2, roughly 492 acres of terrain on the Village Side would, from a practical perspective, remain undeveloped and non-lift-served (refer to Table 3-21). This is attributable to the difficulty in reaching the bottom terminal of the proposed Village Lift from terrain within Sunrise Bowl and further west to *Lunch Run*. The run-out from this terrain requires negotiating roads and flat sections that encumber easy, straight-forward access to the bottom terminal, which is critical to the designation of “lift-served” terrain. Purely from a practical perspective, Village Side terrain that would become lift-served in Alternative 2 is limited to The *Village Skiway* (roughly 7.7 acres), which is the only trail that would lead directly back to the bottom terminal of the proposed Village Lift.

Under the Proposed Action, BVM may remove hazard trees in Sunrise Bowl in the future; however, the Bowl would essentially remain in a natural state. Expert skiers/riders descending terrain in Sunrise Bowl (including trails such as *East Ridge*, *Sunrise*, *Schimke's*, *Sea of Holes* and *School House Ridge*) would be funneled into *The Village Skiway* to reach the bottom terminal of the Village Lift.

Access to the existing *The Village Skiway* would be improved through widening of the Koala Access Road between *Bono's Alley* and the vehicle maintenance shop, as well as through about 1,500 feet of new trail construction. As proposed, this would provide low-level skiers and riders (primarily novice, due to its length) with a way to Bear Valley Village from Koala Top. As is the current situation, the improved *The Village Skiway* would serve as a catch trail for skiers/ snowboarders descending Sunrise Bowl terrain, and direct them to the bottom terminal of the Village Lift. Because it would constitute the only novice/low-intermediate trail on the Village Side, *The Village Skiway* would be groomed under the Proposed Action.

Selective tree removal on the existing *Home Run* and *Lunch Run* trails would better define them for intermediate and advanced intermediate guests descending to Bear Valley Village from Bear Top. Below the intersection of *Home Run* and *Lunch Run*, a proposed culvert over an intermittent drainage would be installed to provide a consistent surface for skier/rider and as snowcat crossing.

#### ***Resort Capacity***

As discussed under existing conditions, calculation of CCC is based on a comparison of uphill vertical lift supply to downhill vertical skiing demand. The installation of the new Village Lift and the upgraded Super Cub would increase the CCC at BVM from 4,690 to 5,140 people.

#### ***Guest Services***

The proposed 12,500-square foot Bear Top Lodge would provide on-mountain food services and restrooms, which BVM currently lacks. The addition of this facility would retain more people on the mountain throughout the day, thereby decreasing the number of skiers descending through beginner/intermediate terrain to the base area for basic services. This would help ease congestion at base area facilities during the mid-day lunch time. This would also be evident throughout the day, on peak days and during inclement weather when outside seating is less desirable.

#### ***Parking***

The increase in parking would have a positive effect on the recreational experience of ski area guests by alleviating some of the parking congestions at BVM. However, this is not a solution to BVM's parking needs. The installation of the Village Lift would address a portion of the parking situation by eliminating the need to Bear Valley Village residents and guests to utilize parking spaces at BVM. It could also eliminate buses from the day skier lots, which affects circulation. In summary, due to the limited area BVM has available to increase parking capacity, parking congestion may be experienced on peak capacity days.

#### ***Alternative 3 (Improved Skier Circulation)***

As previously stated with Alternative 2, implementation of the projects contained in Alternative 3 would be installed over a number of years due to fiscal realities and a short construction season. Therefore, in the long-term, implementation of Alternate 3 could potentially enable BVM to recapture some of the annual visitation it experienced in the 1980s, but has since lost due to the lack of terrain and capital improvements. However, as with any ski area, this is dependent upon many external factors beyond capital/terrain improvements, including economic trends and snowfall.

Because increased visitation directly equates to increased revenues, recapturing some of this annual visitation would make BMV more economically viable in the long term.

*Lift Network*

Under Alternative 3, BVM’s lift network would remain as-is, with the following exceptions.

Super Cub

Under Alternative 2, the upgrade of the Super Cub chairlift is identical to Alternative 2. While operation of the Cub chairlift would be scaled back, as well, Alternative 3 includes a design feature that would trigger operation of the Cub chairlift when the resort experiences a visitation level of 500 guests (which is the point at which they operate it currently). This design feature is primarily intended to reduce pressure on beginner and novice terrain in Bunny Basin that is served by Super Cub and Cub (i.e., it would eliminate the need for beginner and novice skiers/riders to traverse west after unloading Super Cub in order to reach *Cub Meadow*).

The Village and Sunrise Bowl Lifts

Alternative 3 includes the installation of two lifts (i.e., Village Lift and Sunrise Bowl) which would provide lift service to the ski area from Bear Valley Village (Figure 4, map package). In addition to providing a lift connection between the Village and the ski area, the upper of these two lifts—the Sunrise Bowl chairlift—would enable skier/rider circulation throughout the eastern portion of the Village Side terrain. From both a transportation and skier/rider circulation standpoint, Alternative 3 has advantages over Alternatives 1 and 2. This is discussed more under “Terrain Network,” below.

*Terrain Network*

The terrain breakdown under Alternative 3 is compared to the existing conditions in Table 3-22.

As indicated in Table 3-22, under Alternative 3, lift-served terrain increases in all classifications, with the exception of beginner. This is attributable to the addition of the *Mokelumne West Bypass* and widening/recontouring of *Bono’s Alley* and *Water Tank* on the Front Side. On the Village Side, the roughly 83-acre increase in lift-served terrain is owed to the installation of the Sunrise Bowl Chairlift, which would make terrain in Sunrise Bowl (which feeds directly into *The Village Skiway*) directly lift-served (this is not true for Alternative 2).

Table 3-22: Terrain Breakdown – Alternative 3 Compared to Existing Conditions

|                                                     | Terrain Classification           | Existing Conditions Trail Area (acres) | Alternative 3 Trail Area (acres) |
|-----------------------------------------------------|----------------------------------|----------------------------------------|----------------------------------|
| <b>Lift Served Terrain</b>                          | Beginner                         | 1.6                                    | 1.6                              |
|                                                     | Novice                           | 28.9                                   | 50.1                             |
|                                                     | Low Intermediate                 | 58.7                                   | 59.5                             |
|                                                     | Intermediate                     | 73.9                                   | 109.5                            |
|                                                     | Adv. Intermediate                | 65.1                                   | 85.1                             |
|                                                     | Expert                           | 238.3                                  | 246.3                            |
|                                                     | <b>Total Lift-Served Terrain</b> | <b>466.5</b>                           | <b>552.0</b>                     |
| <b>Non-Lift-Served (i.e., Village Side) Terrain</b> |                                  | <b>500</b>                             | <b>417.7</b>                     |

Front Side/Back Side/Lower Mountain Terrain

Skier/Rider Access from Bear Top to the Base Area

The proposed *Mokelumne West Bypass* is identical between Alternatives 2 and 3.

#### Access to the Base Area from Koala Top

In Alternative 3, the top terminal of the proposed Village Lift would be moved further west along Koala Ridge. Therefore, (compared to Alternative 2) skiers and riders who offload the proposed Village Lift top terminal would have multiple choices for descending to the base area (including *NASTAR*, *Feather Duster*, *Sugar*, *Hog Back*, or *Bono's Alley*). Therefore, no one trail would be expected to receive 100% of skier/rider traffic associated with the proposed Village Lift. Accordingly, under Alternative 3, *Bono's Alley* and *Water Tank* are proposed to receive strategic recontouring and widening, but not to the same extent as under Alternative 2. Although additional use of the aforementioned trails is anticipated due to installation of the proposed Village Lift under Alternative 3, the recreational experience in the Koala pod is expected to be maintained.

#### Access to Cub Meadow from the Super Cub Chairlift

As with Alternative 2, about 1 acre of strategic recontouring on upper *Ego Alley* is included in Alternative 3. This is designed to improve access to *Cub Meadow* from the top of the replaced Super Cub chairlift for beginner skiers and riders.

Alternative 3 includes the same provisions for employing a mix of staffing, fencing and signage to help manage the potential for increased mixing of ability levels in Bunny Basin. However, Alternative 3 includes the added provision of triggering the operation of the Cub chairlift on days in which at least 500 guests are at the resort.

#### Village Side Terrain

The installation of the Sunrise Bowl Lift and Village Lift under Alternative 3 would improve skier/boarder circulation while providing a lift and trail connection between BVM and Bear Valley Village. The two-lift configuration in Alternative 3 provides the benefit of lift service from Bear Valley Village with the ability to round-trip ski and ride Sunrise Bowl.

While no “new” trails are proposed in the Village Side under Alternative 3, strategic trail improvements are proposed to benefit the recreational experience. Vegetation removal is proposed in Sunrise Bowl to enable snowcats to groom two routes that would be appropriate for intermediate-level skiers and riders (Figure 4, map package).. One benefit of these two intermediate trails is that they would have the potential to reduce densities on intermediate terrain within the Polar Express pod (located on the Back Side). Also, strategic vegetation removal on *Lunch Run* and *Home Run* is proposed that would better define these trails as skiers and riders descend to Bear Valley Village.

Technically, all terrain on the Village Side of the SUP area would become “lift-served” under Alternative 3—the distinction being that not much of it would be *easily* or *directly* lift-served. Terrain in Sunrise Bowl (which includes named trails, including *East Ridge*, *Sunrise*, *Schimke's*, *Sea of Holes* and *School House Ridge*) would become directly lift-served with the Sunrise Bowl Lift. Furthermore, *The Village Skiway* would funnel skiers and riders down to Bear Valley Village and the proposed Village Lift bottom terminal. As previously discussed, this accounts for the roughly 83-acre increase in lift-served terrain on the Village Side (refer to Table 3-22).

Under Alternative 3, the remaining terrain in the Village Side—roughly 418 acres—would, from a practical perspective, remain undeveloped and non-lift-served. Again, this is attributable to the difficulty in reaching the bottom terminal of the proposed Village Lift from terrain within Dardanelles Vista Bowl and further west to *Lunch Run*. This terrain terminates at Bear Valley Road and Creekside Drive, and beyond that, the run-out back to the lift requires negotiating roads and flat sections that encumber easy, straight-forward access to the bottom terminal, which is critical to the designation of “lift-served” terrain.

From a skier/rider circulation perspective, Alternative 3 has some notable advantages over Alternatives 1 and 2:

- Downloading to Bear Valley Village. Under Alternative 3, skiers and riders of all levels (excluding beginners) could access the bottom of Sunrise Bowl relatively easily and quickly. Because the alignment of the Village Lift in Alternative 3 remains quite gentle for its entire length, it would be download friendly, should guests want to download to Bear Valley Village.
- Increased/Improved circulation options around the mountain. The Sunrise Bowl chairlift would accommodate direct, repeat use of about 75 acres on the eastern side of the Sunshine Bowl terrain. Skiers and riders could access Koala Top and all of the terrain from there down to the base area.
- Better access to Bear Valley base area and rest of mountain from Village. With the Sunrise Bowl lift providing access to Koala Top, all runs off Koala would be available, instead of forcing all skiers/riders onto Bono's Alley. Novice, intermediate, and expert runs are all available from Koala Top.

#### *Capacities*

As discussed under existing conditions, calculation of CCC is based on a comparison of uphill vertical lift supply to downhill vertical skiing demand. The installation of the new Village Lift, Sunrise Bowl Lift, and the upgraded Super Cub would increase the CCC at BVM from 4,690 to 5,500 people.

#### *Guest Services*

Proposed skier/boarder services at BVM would be the same as described under Alternative 2.

#### *Parking*

Proposed parking at BVM would be as described under Alternative 2.

### **CUMULATIVE EFFECTS**

Aside from the development of BVM over the last five decades (dating back to the late 1960s) the only cumulative effects to the developed recreational experience are the 1995 MDP and ongoing vegetation management activities and hazard tree removal.

Projects from the BVM MDP, as approved in the 1995 ROD, could be implemented in the future, contingent upon additional NEPA review and approval. Future projects may include the construction of additional chairlifts, ski trails, a new day lodge (in East Bowl), and parking.

Historic and on-going vegetation management activities (the Bear Valley TSI and hazard removal) are intended to improve public safety, with associated benefits to forest health and the recreational experience at BVM. These projects—particularly the Bear Valley TSI project—have successfully managed/discouraged traffic on private lands in Bear Valley Village while directing skier/rider traffic to the common areas and open space connection points.

## **3.3 EFFECTS RELATIVE TO SIGNIFICANCE FACTORS**

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This section describes the context and intensity factors which provide a basis for determining if an action would have significant effects to the human environment (40 CFR 1508.27). It provides sufficient evidence and analysis for the responsible official to determine whether to prepare an Environmental Impact Statement or a Finding of No Significant Impact.

### **Context**

Context is a site specific action that by itself does not have international, national, regional, or statewide importance. The project area (the Bear Valley Mountain Special Use Permit area) is located in the northern end of the Stanislaus National Forest and is within the "Winter Sports Sites"

Management Area (USDA 2010). Management emphasis for these areas is to provide developed opportunities for winter sports; provide aesthetically pleasing, well maintained, fully equipped facilities for the pleasure and safety of Forest visitors; and to protect proposed winter sports sites for future development. The [BVM] site is located within the heavily used Lake Alpine/Mt. Reba area in the northern portion of the Forest. Bear Valley is a major alpine ski resort and the site includes areas for expansion of the existing facilities (p. 177).

## **Intensity**

Intensity means the degree to which the Alternatives would involve one or more of the following ten factors:

### **1. Impacts that may be both beneficial and adverse.**

Greenhouse gas (GHG) emissions were considered in proportion to the nature and scope of the Proposed Action including the potential to either affect emissions or be affected by climate change impacts. There may be increases in GHG emissions from additional vehicular traffic, project construction/implementation, grooming, and operation of the Bear Top Lodge. This would increase GHG emissions in the vicinity of the ski area. However, taken individually, these components of the Proposed Action are of such a minor scale in the context of global climate change that the quantification or qualification of direct, indirect, or cumulative effects would be meaningless to a reasoned choice among alternatives. A detailed analysis of GHG emissions is contained in Appendix B.

Greenhouse gas (GHG) emissions were considered in proportion to the nature and scope of the Proposed Action including the potential to either affect emissions or be affected by climate change impacts. There may be increases in GHG emissions from additional vehicular traffic, project construction/implementation, grooming, and operation of the Bear Top Lodge. This would increase GHG emissions in the vicinity of the ski area. However, taken individually, these components of the Proposed Action are of such a minor scale in the context of global climate change that the quantification or qualification of direct, indirect, or cumulative effects would be meaningless to a reasoned choice among alternatives. A detailed analysis of GHG emissions is contained in Appendix B.

The Action Alternatives would result in the removal of trees that provide habitat for various wildlife species within the SUP area. A BAE for Forest Service Sensitive wildlife and botanical species was completed for the project, which determined that in regards to the Action Alternatives, that proposed project activities May affect individuals, but is not likely to contribute to the need for federal listing or result in loss of viability for this species in the planning area.

The Wildlife MIS report prepared for this project determined that the Action Alternatives would provide for the maintenance of generally well-distributed viable populations of existing native and desired non-native wildlife and fish, including MIS.

Construction of the project is not expected to affect the growth rate, ethnic composition, income or the poverty level of Bear Valley Village or Alpine County. The average growth rate would continue to depend on such factors as employment opportunities, housing availability, and regional economic conditions. There would be no unfair adverse effects on any low income or minority groups in the area. No public comments were received during scoping related to this resource. The project is not expected to negatively affect the socio-economic composition of the region. In fact, these projects are more likely to represent an economic stimulus in an otherwise economically depressed community.

Alternative 2 and 3 project activities would impact the soil resources in the project area primarily through addition of impervious surfaces and trail clearing and grading (e.g., parking lots, buildings, lift terminal and towers) which remove or compact soils.

Proposed project activities would avoid direct impacts to wetlands to the greatest extent possible. The only projects proposed that could potentially impacts wetlands are the replacement of Super Cub and trail grading on Water Tank. There is one proposed intermittent stream crossing associated with the Home Run/Lunch Run trail improvements. No other project activities would have any impacts to stream channels. Erosion control measures, e.g., silt fence or wattles, would be placed above ordinary high water to control sediment movement during rain events and site stabilization. Under all Action Alternatives, proposed project activities are not expected to measurably impact water quality.

Benefits of the Action Alternatives are recreation-oriented. These include, but are not limited to: improved access/egress for lower ability level skiers/snowboarders; lift-served access to the ski area from Bear Valley Village; increased parking efficiencies, and new on-mountain guest services.

**2. The degree to which the proposed action affects public health or safety.**

As discussed in Chapter 3, the Action Alternatives would improve novice through expert circulation between Bear Top/Koala Top and the base area. By better separating user groups, this would make for a more pleasant, and safer, recreational experience at BVM. No other effects to health or human safety have been identified.

Implementation of the Action Alternatives would avoid adverse impacts to public safety through project design efforts. Implementation of the action alternatives would be governed by standard public health and safety contract clauses. Standard precautionary measures such as dust abatement, signing of roads during log and biomass hauling, safely securing truckloads, and maintaining the haul route, would be used.

Short-term adverse effects on public health related to air quality from pile burning are a small possibility and management requirements have been developed to mitigate these effects. These potential short-term effects are of limited scope and duration and have been minimized to the extent possible through timing of pile burning. Regional air quality standards would be met in a manner consistent with the Clean Air Act.

**3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.**

While numerous cultural resources are located within the BVM SUP area, the location and treatments described herein will not affect cultural resources. There are no prime farmlands, prime rangelands, prime forest lands, or ecologically critical areas within the project area. The project area does not contain rivers designated wild and scenic. While Stanislaus National Forest lands are a valued asset there would be no one-of-a-kind (unique) characteristics affected by the Action Alternatives. Chapter 3 of this EA addresses the potential environmental consequences of the Action Alternatives.

There are several headwater streams and wetlands present within the ski area. Analysis provided within the EA indicates that, through project design and incorporation of best management practices, impacts to streams and wetlands can be minimized or eliminated. Upon approval, and where appropriate, permits may need to be obtained prior to construction.

4. **The degree to which the effects on the quality of the human environment are likely to be highly controversial.**

As defined by the STF's 2010 Forest Plan Direction, BVM Special Use Permit (SUP) area is within the "Winter Sports Sites" Management Area. In order to promote public understanding of the project, the Forest Service conducted several public meetings in Bear Valley Village and participated in collaborative meetings with Alpine County. Public scoping of the Proposed Action generated ten comment letters. Comments and relevant issues identified in these letters were used to develop the issues and alternatives discussed in June 2011 EA. The 30-day comment period on the June 2011 EA yielded one comment letter – from the Central Sierra Environmental Resource Center.

Although Central Sierra Environmental Resource Center commented on many of the components included in Alternatives 2 and 3, through involvement and discussion with interested publics, controversy over environmental effects was minimized during project design. Activities and treatments proposed are standard practices for Winter Sports Site Management Areas on the Forest, and are not considered to be highly controversial. The Action Alternatives are consistent with Forestwide Standards and Guidelines, as well as with requirements specific to the Winter Sports Site Management Area. All proposed projects would be implemented within the extent of the SUP area and are not considered out of context with BVM's operational needs or guests' expectations for a developed winter sports area. Consideration was given to long-term beneficial effects of the project.

5. **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.**

The effects on the human environment from the Action Alternatives are not uncertain and do not involve unique or unknown risks. The proposed activities are typical of those associated with developed ski areas and winter sports sites. These types of activities have all been previously implemented at BVM and other developed ski area with known effects.

6. **The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.**

A precedent would not be set for future decisions with significant effects. Future projects would be considered, evaluated, and analyzed separately on their own merits.

7. **Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.**

According to the CEQ regulations "cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions (40 CFR 1508.7).

This analysis relies on current environmental conditions as a proxy for the impacts of past actions. Existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects. In addition, the CEQ issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of each individual past action." The cumulative effects analysis in this environmental assessment is also consistent with Forest Service National Environmental Policy Act Regulations (36 CFR 220.4[f]) (July 24, 2008).

Past, present, and reasonably foreseeable future actions were assessed along with Action Alternatives to determine whether cumulative effects would occur. Each resource specialist identified the appropriate cumulative effects analysis area specific to their resource.

**8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.**

The activities described in the Action Alternatives will not adversely affect or cause the loss or destruction of significant districts, sites, highways, structures, or objects listed in, or eligible for listing in the National Register of Historic Places. Heritage resources have been considered in all aspects of this project. The entire area was surveyed, and while numerous cultural resources are located within the BVM SUP area, the location and treatments described in the EA will not affect cultural resources.

**9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.**

The BAE, completed for this project to analyze and disclose effects to threatened or endangered species or its habitat, determined that there are no known federally listed threatened or endangered species present within the project area that would be impacted by the proposed project.

**10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.**

The Action Alternatives are consistent with applicable management direction contained in the Forest Plan as discussed throughout Chapter 3 of this EA. The Action Alternatives were developed in accordance with, and do not threaten to violate, any Federal, State, or local laws or requirements imposed for the protection of the environment (i.e., Endangered Species Act, National Historic Preservation Act, Federal Clean Water Act, Executive Order 11988 for Floodplain Management, or the Clean Air Act). BVM would obtain all required permits from the appropriate county, state, and federal regulatory agencies prior to implementation. These permits could include building and electrical permits from Alpine County for the Bear Top Lodge, and Section 404 permit from the Army Corps of Engineers for unavoidable wetland impacts.

## 4. Consultation and Coordination

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this Environmental Assessment.

### ***Interdisciplinary Team***

|                  |                                                                       |
|------------------|-----------------------------------------------------------------------|
| Susan Skalski    | Forest Supervisor, Responsible Official, Stanislaus National Forest   |
| Teresa McClung   | District Ranger/IDT leader, Calaveras Ranger District                 |
| Patty Clarey     | Recreation Officer, Calaveras Ranger District                         |
| Kendal Young     | NEPA Coordinator, Natural Resource Planner, Calaveras Ranger District |
| Dave Vosti       | Recreation, Calaveras Ranger District                                 |
| Joel Egan        | Forest Entomologist, Stanislaus National Forest                       |
| Beverly Bulaon   | Forest Entomologist, Stanislaus National Forest                       |
| Martin MacKenzie | Forest Pathologist, Stanislaus National Forest                        |
| Jim Frazier      | Forest Hydrologist, Stanislaus National Forest                        |
| Alex Janicki     | Soil Scientist, Stanislaus National Forest                            |
| Jim Behm         | District Culturalist, Calaveras Ranger District                       |
| Aileen Palmer    | Wildlife Biologist, Calaveras Ranger District                         |
| Steve Holdeman   | Aquatic Biologist, Stanislaus National Forest                         |

### ***Consultants***

|               |                                   |
|---------------|-----------------------------------|
| Kent Sharp    | Principal, SE Group               |
| Jason Marks   | Project Manager, SE Group         |
| Chris Ward    | Environmental Analyst, SE Group   |
| Pete Williams | Senior Mountain Planner, SE Group |
| Dale Keyser   | Wildlife Biologist                |
| Harold Basey  | Botanist                          |

### ***Federal, State and Local Agencies***

United States Fish and Wildlife Service  
California Department of Fish and Game  
Bear Valley Water District  
Alpine County  
Calaveras County

### ***Tribes***

Tuolumne Band of Me-Wuk Indians  
Washoe Tribe of Nevada and California



## References

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## A. Bear Valley Mountain Environmental Management Plan

### **ENVIRONMENTAL POLICY STATEMENT**

As stewards of an exceptional mountain environment, Bear Valley Mountain is committed to providing quality outdoor recreation experiences. Our staff and guests realize Bear Valley is a priceless natural treasure. We strive to continually improve our environmental performance in order to provide enjoyment of Bear Valley Mountain for future generations of snow and mountain enthusiasts.

### **Sustainable Slopes**

Bear Valley Mountain is an active member of the National Ski Area Association's Sustainable Slopes program. This voluntary program shows our dedication to improving our environmental policy creation and implementation. The NSAA has created a thorough set of environmental guidelines specific to operating a ski area, and an industry meeting point for trading new ideas. By sharing our knowledge and experience we can improve our mountain operation and improve the industry as a whole. ([www.nsaa.org](http://www.nsaa.org))

We are also monitored by the Great Basin Air Quality Resources Board, California Air Resource Board, Alpine County Health Dept, California Occupational Safety and Health, United States Forest Service and the California Environmental Protection Agency. These agencies monitor and track many of our environmental compliance requirements.

### **Purchasing Renewable Energy**

Bear Valley Mountain has established a contract with *Renewable Choice Energy* and is purchasing *Green-e Certified Clean Source* power. This third party certified carbon neutral electricity comes from solar and wind generation plants all over the American West. Operating the chairlifts is one of our highest areas of electrical usage and reducing that carbon foot print by purchasing renewable energy to run the chairlifts is one of the most important aspects of our Environmental Plan. Additionally, we are purchasing clean power to reduce our carbon dioxide emissions for snowmaking as well, thereby taking several steps to offset our energy usage. As of the 2009-2010 season, 66% of the electricity we use will be from a certified clean source. This year we will prevent more than 450 tons of CO<sub>2</sub> from being produced therefore combating global warming. By the beginning of the 2010-2011 season we will be purchasing 100% clean power for all the lifts, facilities and snowmaking! From there on, we will be preventing at least 711 tons of CO<sub>2</sub> entering the atmosphere every year! ([www.renewablechoice.org](http://www.renewablechoice.org))

Additionally, Bear Valley Mountain has completely offset (100%) the carbon impacts of the main day lodge. We have enrolled in PG&E's *Climate Smart Program*. This exciting program allows PG&E customers to invest in carbon offsets equal to how much CO<sub>2</sub> their home or business creates. Climate Smart invests in new independently certified greenhouse gas emission reduction projects in California. These projects include restoring native redwood forests and capturing methane gas from dairy farms, just to list a couple. ([www.joinclimatesmart.org](http://www.joinclimatesmart.org))

### **Equipment Efficiencies**

We recently commissioned an independent Energy Design Resources Team to perform an energy audit of all lighting fixtures at our two largest consumers of energy, the Day Lodge and the Vehicle Maintenance Shop. As a result of this audit, we have committed to make the recommended changes in two phases. The first phase will retrofit all of the lighting in the Vehicle Maintenance Shop. This

project will be completed by mid-January and it is estimated to reduce our annual energy use from 56,000 kw down to 29,000kw or 46%. The actual results will then be monitored to gauge the success of the energy reductions and based off of those findings, Phase 2 would be scheduled for the following season. Phase 2 will be a similar upgrade to all Day Lodge lighting. This upgrade will reduce the Day Lodge kw usage by 55%.

Our fleet of snowmaking guns has been vastly improved with last year's purchase of 12 new energy efficient guns. These new technologically advanced units replace 12 out dated and inefficient equipment. These new guns use 30% less electricity to make a better quality snow. A computerized weather monitoring system is connected directly to the snowmaking system to make micro adjustments as small changes in weather occur. We use a variable frequency drive (VFD) to pump water from the town reservoir up to our snowmaking pond at the summit of the mountain. The VFD allows for the minimum energy usage for the maximum water flow. From the summit pond, the snowmaking system is gravity fed to over 90% of the snowmaking locations using essentially no electricity to pump the water through the distribution system. The snowmaking system generally only operates in the beginning of the season to around the first of the year, but improving the power and water efficiency curves can make a big difference in reducing our environmental impacts.

We are continuing to update our snowmobile fleet with four stroke models. Currently, about 40% of the snowmobile fleet has been refreshed with four stroke models. These new machines are quiet, powerful, and very fuel efficient. The most recent addition to the fleet is a Ski Doo Skandic with a Rotax 4 stroke engine, you may see it being utilized by the ski patrol. This powerful all mountain machine has an EPA Normalized Emission Rating of nearly zero. It is the most efficient four stroke snowmobile available. While only 40% of our fleet of snowmobiles is four strokes now, we plan to continue replacing the older models as necessary and financially feasible.

Bear Valley operates a variety of machines and equipment. The snowcats, several company trucks, snow removal equipment and the backup power units for the chairlifts all operate on diesel. This year we are using a B10 Biodiesel fuel blend. The 08/09 season was the first season for Biodiesel which replaced 55% of all diesel used on the mountain. In the 2010 season Biodiesel will be increasing it to 75% of total annually used. Biodiesel is a renewable fuel source made from plant oils and used cooking oil. Embracing this technology adds to the list of things we are doing to share in combating global warming to save our winters.

Last March we established the new anti-idling campaign for all diesel vehicles to reduce emissions from resort vehicles. This includes reminder stickers located in prominent locations to remind the drivers not to needlessly idle. Many of the newer snowcats have tattletale systems to monitor how much idle time a cat may have had during a working shift.

## **Employee Incentives to Reducing Our Carbon Foot Print**

Every day of the winter season, Bear Valley Mountain operates an employee shuttle bus. This bus carries staff 32 miles to and from the mountain from the towns of Avery, Arnold, Dorrington and Camp Connell to Bear Valley. The bus is free for employees and encourages up to 60 people to use the shuttle every day of the season. The bus makes one or two round trips per day depending on employee needs. During the regular season the bus is mostly full on weekends, holidays and when the road conditions warrant vehicle restrictions. In the event that there are more than 60 people, an additional bus will be added to the route. In the off season BVM offers additional car pool opportunities to its summer employees by allowing a company vehicle to be used when it contains four or more occupants.

**Employee Driven Environmental Fund:** Bear Valley Mountain has created an opportunity for employees to support local environmental organizations through charitable donations. Every dollar contributed will be matched by the company up to \$1000. We are specifically looking to support

environmental organizations that have a focus or significant program in the highway 4 area. This season we will donate \$1000.00 to the Foot Hills Conservancy.

## **Reuse, Renew, Reclaim and Recycle**

Recycling waste in the lodge and on the mountain is and has been in full swing. We collect aluminum, plastic and glass containers from the public areas in and around the lodge, as well as key locations on the mountain. In house recycling is even more thorough; paper, cardboard and drink containers are all collected and recycled. We will renew our efforts this season to maximize our mixed recycling container allowing more opportunities to reduce the waste stream to the landfill. In addition to recycling material after use, we have a purchasing policy that demands minimum 30% recycled content in all office paper.

Our purchasing efforts include the reduction of plastic by not buying any single drink units that can be substituted with a fountain type drink. In other words, we do not sell a bottle of Pepsi if you can purchase it in a cup from the fountain machines. In the Monte Wolfe Saloon we have initiated several waste stream reduction efforts. Among this is the Mug Club, here we allocate space for 150 personalized mugs drastically reducing plastic cup use. The plastic cups we use in Saloon are made up of corn starch and are completely biodegradable. Through the use of draft products we have eliminated all but three of brands glass bottles, reducing glass by 70%. All remaining glass and plastic products from the Saloon are recycled. This alone has reduced or diverted well over 40% of the waste stream to the landfill. It is difficult to measure this in tonnage, but we are working on a weight and measure metric.

In the F&B Operations all grease and fryer oils are saved in a special container and picked up by a waste oil recycler. The Vehicle Maintenance shop and Lift Maintenance work with a waste oil recycler to recycle 100% of oils produced from the vehicle and engine services.

Last summer during the Mid-Mountain Lodge remodel, BVM reused 65% the lumber, display cases, windows and doors. Keeping 100's pounds of construction materials from entering the landfill. Additionally, when old lights and light fixtures were replaced in the remodel the newer high efficiency T4 and T9 lights were installed.

The maintenance shops have recycling containers for all the scrap metals including steel, copper and aluminum. A couple of times a year these containers are picked up and taken to a center in the Stockton area to melt down and reuse.

The impacts of road building in an alpine environment are myriad. Over the years many maintenance related roads have been created and with those roads comes the social network of trails that the general public created. BVMT is in the process of inventorying the established maintenance roads and will designate all unnecessary roads and trails for reclamation. BVMT will at its own expense close, reclaim and re-vegetate roads and trails not needed for essential use.

## **Opportunities to Reduce Your Carbon Foot Print**

Bear Valley Mountain is working with *Atmosclear* to sell *Climate Club* memberships. *Atmosclear* sells verified emission reductions (VERs) to help individuals and businesses offset their personal carbon dioxide emissions. Purchasing an emission reduction credit through *Atmosclear* is a concrete way to measure your contribution, and mitigate your impact. Start undoing your CO<sub>2</sub>, for a mere \$25.00, you can purchase enough carbon credits to completely offset your drive to and from the mountain for the whole season. Memberships for *Climate Club* can be attained at any BVM ticket office window. More information is available at ([www.atmosclear.org](http://www.atmosclear.org))

BVM also has partnerships with Valley and Bay Area businesses to sponsor coach style buses to come up and ski for the day. Mel Cottons sport shop, and Helm of Sun Valley ski shops organize fun and economical trips from the San Jose area.

Additional public mass transportation is available through Calaveras Transit. Every Saturday, Sunday and most Holidays they offer a shuttle service to the nominal fee of \$10.00.

([www.calaverastransit.org](http://www.calaverastransit.org))

New this season (09/10) is the BV Car Pool incentives that are based on 3 or more persons per vehicle. On key Saturdays and Holidays during the season BV parking lot staff will be handing out special raffle coupons. When the guest fills out the necessary information and turns the coupon into the ticket office, they will be entered into a monthly drawing to win valuable and fun prizes.

## **The Future of the Mountains**

Ski areas have taken tremendous steps to reduce our own GHG emissions. Many resorts are generating renewable energy on site through the application of wind, solar, geothermal and micro-hydro technology. Resorts are also purchasing renewable energy credits (RECs), applying energy-efficient green building techniques, retrofitting existing facilities to save energy, using alternative fuels in resort vehicle fleets, and providing or promoting carpooling or mass transit use by guests and employees. While we believe we are a relatively small source of greenhouse gas emissions, we however recognize the need to educate others on the importance of reducing our foot print on the environment and that we will need the help of many other industries to counter act the climate change reality the we all share.

## B. Air Quality and Greenhouse Gas Emissions

This air quality and greenhouse gas (GHG) emissions analysis focuses on the BVM SUP area (NFS lands), and areas proximate to BVM on private lands. It also describes potential effects to the Mokelumne Wilderness, an adjacent Class I airshed.

### **CLEAN AIR ACT**

The Clean Air Act (CAA) was enacted in 1963, but it contained few requirements for reducing air pollutant emissions. It was amended numerous times through 1990 to address reductions in vehicular and stationary source emissions and to establish national air pollution concentration limits. The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for six air pollutants: ozone, lead, carbon monoxide, sulfur dioxide, nitrogen dioxide, and respirable particulate matter. The standards were established to protect the public from exposure to harmful amounts of pollutants. When the pollutant levels in an area have caused a violation of a particular standard, the area is classified as “non-attainment” for that pollutant. The EPA then imposes federal regulations on pollutant emissions and designates a time period in which the area must again attain the standard. NAAQS set the levels of air quality for the United States; they are the minimum and might be more stringent from state to state. New Source Performance Standards set emission standards for major sources and the State Implementation Plan (SIP) procedures, were designed to non-attainment areas to within the standards.

Air quality effects related to implementation of the Action Alternatives are emissions during construction and from emissions related to potential increase in the number of vehicles driving to BVM. The following tables serve as a general reference for Ambient Air Quality Standards for the nation (Table B-1) and for California (Table B-2).

The CAA designates two different air quality areas that receive different levels of protection (42 USC 7401 1990). Class I areas generally include national parks, Federally-designated wilderness areas that are in excess of 5,000 acres and that were created prior to 1977, national monuments, national seashores, and other areas of special national or regional value. Class I designation warrants the highest level of protection afforded to an area. Class II designation typically applies to non-Class I areas. There are no Class I airsheds within the project area. However, one Class I airshed – the Mokelumne Wilderness – is directly adjacent to the project area. A Class II airshed, the Carson-Iceberg Wilderness, is approximately 3 air miles to the east.

Class I and II airsheds are either designated as attainment, non-attainment, or unclassifiable areas. Unclassifiable designations apply where pollution is not anticipated to exceed national standards and where insufficient information is available to either substantiate or reject this assumption. Unclassified areas generally have little, if any, industrial development and comparatively sparse populations. The low likelihood of air quality problems makes these areas a lower priority for expensive monitoring programs.

Prevention of Significant Deterioration (PSD) permits are required for “major emitting facilities,” which emit, or have the potential to emit, 100 tons or more per year of any air pollutant listed in Table B-1 (42 USC 7475[a] and 7479[1] 1997). EPA regulations specifically list the sources that are considered “major emitting facilities;” this list does not include ski areas (42 USC 7479[1] 1997). However, the regulations note that the term “major emitting facilities” also includes “any other source with the potential to emit 250 tons per year or more of any air pollutant.” A PSD permit is not required for BVM because ski areas are not classified as stationary sources. For clarity, the list of stationary sources is found in 42 USC 7479[1] 1997 and is solely comprised of industrial facilities (e.g., kraft pulp mills, Portland Cement plants, primary zinc smelters).

Table B-1: National Ambient Air Quality Standards for Criteria Pollutants

| Pollutant                                                        | Primary Standards <sup>a</sup>                                          | Averaging Times                                                                        | Secondary Standards                                   |
|------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------|
| Carbon Monoxide                                                  | 9 ppm (10 mg/m <sup>3</sup> )<br>35 ppm (40 mg/m <sup>3</sup> )         | 8-hour <sup>b</sup><br>1-hour <sup>b</sup>                                             | None<br>None                                          |
| Lead                                                             | 0.15 µg/m <sup>3</sup><br>1.5 µg/m <sup>3</sup>                         | Rolling 3-month Average<br>Quarterly Average                                           | Same as Primary<br>Same as Primary                    |
| Nitrogen Dioxide                                                 | 0.053 ppm (100 µg/m <sup>3</sup> )<br>0.100 ppm                         | Annual (Arithmetic Mean)<br>1-hour <sup>h</sup>                                        | Same as Primary                                       |
| Particulate Matter (PM)<br>PM <sub>10</sub><br>PM <sub>2.5</sub> | 150 µg/m <sup>3</sup><br>15.0 µg/m <sup>3</sup><br>35 µg/m <sup>3</sup> | 24-hour <sup>bc</sup><br>Annual <sup>d</sup> (Arithmetic Mean)<br>24-hour <sup>e</sup> | Same as Primary<br>Same as Primary<br>Same as Primary |
| Ozone                                                            | 0.075 ppm (2008 std)<br>0.08 ppm (1997 std)                             | 8-hour <sup>g</sup><br>8-hour <sup>f</sup>                                             | Same as Primary<br>Same as Primary                    |
| Sulfur Dioxide                                                   | 0.075 ppm                                                               | 24-hour <sup>j</sup><br>3-hour <sup>b</sup>                                            | 0.5 ppm (1300 µg/m <sup>3</sup> )                     |

<sup>a</sup> ppm = parts per million, µg/m<sup>3</sup> = micrograms per cubic meter, mg/m<sup>3</sup> – milligrams per cubic meter

<sup>b</sup> Not to be exceeded more than once per year.

<sup>c</sup> 3-year average of the weighted annual mean PM<sub>10</sub> concentration at each monitor within an area must not exceed 50 µg/m.

<sup>d</sup> 3-year average of the weighted annual mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m.

<sup>e</sup> 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 65 µg/m.

<sup>f</sup> 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

<sup>g</sup> 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm.

<sup>h</sup> 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm.

<sup>j</sup> 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years

Source: U.S. Environmental Protection Agency. 2009a. Air and Radiation: National Ambient Air Quality Standards (NAAQS). <http://www.epa.gov/air/criteria.html>. Accessed January 10, 2012.

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

## Climate Change

### Federal

Emissions which contribute to climate change are called greenhouses gases (GHG), as they allow more solar radiation in at the upper atmospheres and trap heat in the lower atmosphere. The primary GHGs are carbon dioxide (CO<sub>2</sub>), O<sub>3</sub>, methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). Natural sources of CO<sub>2</sub> occur within the carbon cycle where billions of tons of atmospheric CO<sub>2</sub> are removed from the atmosphere by oceans and growing plants, also known as “sinks,” and are emitted back into the atmosphere annually through natural processes also known as “sources.”

GHG discussions generally focus on CO<sub>2</sub>, as it constitutes approximately 85% of all GHG emissions worldwide. Within the United States, fossil fuel combustion accounted for approximately 94.1% of CO<sub>2</sub> emissions in 2008. The largest source of these CO<sub>2</sub> emissions was from the burning of fossil

fuels such as coal, oil and gas in power plants, automobiles, industrial facilities, and other sources. The transportation sector directly accounted for about 28% of total United States GHG emissions, making it the second largest source of GHG emissions, behind electricity generation (34%). Globally, approximately 30,377 Teragrams (Tg) of CO<sub>2</sub> (1 teragram = 1,000,000 metric tons) were added to the atmosphere through the combustion of fossil fuels in 2008, of which the United States accounted for about 19%.

The Environmental Protection Agency (EPA) (2007) developed a “State of Knowledge” paper that outlines what is known and what is uncertain about global climate change. The following elements of climate change are known with near certainty:

1. Human activities are changing the composition of Earth’s atmosphere. Increasing levels of greenhouse gases, like carbon dioxide (CO<sub>2</sub>) in the atmosphere since pre-industrial times, are well-documented and understood.
2. The atmospheric buildup of CO<sub>2</sub> and other greenhouse gases is largely the result of human activities such as the burning of fossil fuels.
3. An “unequivocal” warming trend of about 1.0° to 1.7° F occurred from 1906-2005. Warming occurred in both the Northern and Southern Hemispheres and over the oceans (IPCC, 2007).
4. The major greenhouse gases emitted by human activities remain in the atmosphere for periods ranging from decades to centuries. It is therefore virtually certain that atmospheric concentrations of greenhouse gases would continue to rise over the next few decades.
5. Increasing greenhouse gas concentrations tend to warm the planet.

According to EPA (2007), however, it is uncertain how much warming would occur, how fast that warming would occur, and how the warming would affect the rest of the climate system including precipitation patterns.

In addition to the EPA’s “State of Knowledge” paper, in February 2010, the CEQ provided a draft guidance memorandum for public consideration and comment on the ways in which Federal agencies can improve their consideration of the effects of GHG emissions and climate change in their evaluation of proposals for Federal actions under NEPA. The CEQ document is titled “Draft NEPA Guidance on Consideration of the Effects on Climate Change and Greenhouse Gas Emissions (CEQ 2010).

The 2010 CEQ draft guidance memo states: “...for Federal actions that require an EA or EIS the direct and indirect GHG emissions from the action should be considered in scoping and, to the extent that scoping indicates that GHG emissions warrant consideration by the decision maker, quantified and disclosed in the environmental document.” The guidance goes on to say that:

“.... if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO<sub>2</sub>-equivalent GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. For long-term actions that have annual direct emissions of less than 25,000 metric tons of CO<sub>2</sub>-equivalent, CEQ encourages Federal agencies to consider whether the action’s long-term emissions should receive similar analysis.”

### ***State of California***

In California, the main sources of GHG emissions are from the transportation and energy sectors. According to the California Air Resources Board (CARB) draft GHG emission inventory for the year 2004, 39% of GHG emissions result from transportation and 25% of GHG emissions result from electricity generation California produced 497 million metric tons of CO<sub>2</sub>e (MMtCO<sub>2</sub>e) in 2004 (CARB 2007). California produces about 2% of the world’s GHG emissions.

The potential effects of future climate change on California resources include (California Climate Change Portal [CCCCP] 2007):

- Air temperature: increases of 3 to 10.4 degrees Fahrenheit by the end of the century, depending on the aggressiveness of GHG emissions mitigation
- Sea level rise: 6 to 30 inches by the end of the century, depending on the aggressiveness of GHG emissions mitigation
- Water resources: reduced Sierra snowpack, reduced water supplies, increased water demands, changed flood hydrology
- Forests: changed forest composition, geographic range, and forest health and productivity
- Ecosystems: changed habitats, increased threats to certain endangered species
- Agriculture: changed crop yields, increased irrigation demands
- Public health: increased respiratory illness and weather-related mortality

Table B-2: NAAQS for California

| Pollutant                                                            | Averaging Time          | California Standard |
|----------------------------------------------------------------------|-------------------------|---------------------|
| Carbon Monoxide (ppm)                                                | 1 hour                  | 20                  |
|                                                                      | 8 hour                  | 9                   |
| Nitrogen Dioxide (NO <sub>2</sub> ) (ppm)                            | Annual                  | 0.030               |
|                                                                      | 1 hour                  | 0.18                |
| Particulate Matter (PM <sub>10</sub> ) (micrograms/m <sup>3</sup> )  | 24 hour                 | 50                  |
|                                                                      | Annual                  | 20                  |
| Particulate Matter (PM <sub>2.5</sub> ) (micrograms/m <sup>3</sup> ) | 24 hour                 | -                   |
|                                                                      | Annual                  | 12                  |
| Ozone (ppm)                                                          | 1 hour                  | 0.09                |
|                                                                      | 8 hour                  | 0.070               |
| Sulfur Dioxide (SO <sub>2</sub> ) (ppm)                              | Annual                  | -                   |
|                                                                      | 24 hour                 | 0.04                |
|                                                                      | 1 hour                  | 0.25                |
| Lead (Pb) (micrograms/m <sup>3</sup> )                               | Rolling 3-Month Average | -                   |
|                                                                      | 30 day Average          | 1.5                 |
|                                                                      | Quarterly Average       | -                   |

Source: CARB 2009

In California GHGs are primarily regulated under the Global Warming Solutions Act (AB 32), which established a comprehensive program to reduce GHG emissions from all sources throughout the state. The goal of AB 32 is to reduce California's greenhouse gas emissions to 1990 levels by 2020, representing a 25-percent reduction statewide, with mandatory caps beginning in 2012 for significant emissions sources (e.g., refineries, power plants, industrial facilities, transportation fuels).

The EPA retains oversight authority but has delegated enforcement of the CAA to the states. The state is required to develop and administer air pollution prevention and control programs; state standards must be either the same as, or more stringent than, Federal CAA standards. These standards are described in Table B-2.

BVM lies within the Great Basin Valleys air basin and is governed by the Great Basin Unified Air Pollution Control District (GBUAPCD). GBUAPCD's purpose is to enforce Federal, State and local

air quality regulations and to ensure that the federal and state air quality standards are met in the district.

## Affected Environment

### *Climate and Meteorology*

The climate in the project area is typical for mid-range, western slopes of the Sierra Nevada. Characterized by long, relatively mild winters and short, dry summers, the weather pattern at BVM is mainly influenced by the semi-permanent high pressure area in the northern Pacific Ocean. Precipitation normally falls as snow during the winter months, with occasional rain on the snowpack. Snow can be expected at any time from October through May; however, during the peak months of January, February, and March, the snowpack averages roughly 75 inches. Annual precipitation averages approximately 50 inches; infrequent thunderstorms comprise the bulk of summer precipitation.

The strongest winds exceed velocities of 100 miles per hour. While local topography usually provides adequate protection from damaging winds, BVM has occasionally stopped operating their more exposed chairlifts for safety reasons. Temperatures in the project area vary greatly depending upon exposure to sun, vegetation, and terrain features. Temperatures at the 7,000-foot level hover below freezing from November through March. Daytime high temperatures average in the low 30s, with nighttime lows between 15 and 20 degrees Fahrenheit. Occasionally, temperatures drop below -10 degrees Fahrenheit and wind chill factors create even lower equivalent temperatures. During the summer, afternoon temperatures average in the mid-1970s.

### *NAAQS Pollutants*

According to the GBUAPCD the primary air pollutant present in Alpine County is particulate matter (PM)<sup>14</sup>. Other than particulate matter, most day-to-day pollutant sources in the BVM area are assumed to result from mobile sources. Potential on-road sources of air pollution in the BVM area include automobiles, trucks, and buses. Other mobile sources outside BVM include recreational boats, recreational vehicles, residential fuel combustion and fuel storage and handling. Of these potential sources, on-road vehicles and residential fuel combustion are anticipated to have the greatest effect on the air quality in the vicinity of BVM. Table B-3 lists air quality data for Alpine County.

Automobile emissions, like other mobile sources, can occur over a broad geographic areas. The effects of automobile emissions are thus dispersed over a broad geographic area, and is highly dependent on topographic and climatic conditions.

Table B-3: Alpine County Estimated Annual Average Emissions (metric tons)

|                        | CO    | NOx   | SOx  | PM2.5  | PM10  |
|------------------------|-------|-------|------|--------|-------|
| On-road Motor Vehicles | 273.8 | 182.5 | 0.00 | 7.3    | 7.3   |
| Other Mobile Sources   | 722.7 | 29.2  | 0.00 | 3.65   | 7.3   |
| Total Misc Processes*  | 255.5 | 7.3   | 3.65 | 113.15 | 730   |
| Total Annual Emissions | 1,252 | 219   | 3.65 | 124.1  | 744.6 |

\* This category includes residential fuel combustion  
Source: CARB 2009

<sup>14</sup> <http://www.gbuapcd.org/background.htm> - Great Basin Unified Air Pollution Control District, last accessed March 28, 2012.

## GHG Contribution of BVM Operations

### MOBILE SOURCES

It is not currently possible to accurately discern the effects of BVM from the effects of all other GHG sources worldwide. Currently, the Forest Service does not have a standard tool for measuring greenhouse gas emissions. However, the EPA has provided guidance on how to calculate GHG emissions related to mobile sources, this guidance was used to determine the impact vehicle trips associated with TSV's operations. Therefore, by developing assumptions related to traffic created by guests accessing facilities at BVM it is possible to estimate the GHG emitted by existing vehicle trips produced by visitors accessing facilities at BVM during the winter operating season. The assumptions were related to the origin of guests (e.g., Sacramento and San Francisco Bay Area), and the number of guests who utilize lodging. For example, as BVM is primarily a day use ski area the majority (roughly 95%) of BVM's guests are skiers and riders who reside within a three-hour driving distance.<sup>15</sup> The remaining minority (5% of BVM's guests) are skiers and riders who reside in the Town of Bear Valley or destination guests who stay within in the limited bed base in the Town of Bear Valley and only drive to and from the resort at the beginning and end of their vacation. From regional airports (e.g., Sacramento International Airport), destination guests typically either use a shuttle service or rent a car for the approximately two-to-three hour drive to the mountains.

Discussed above, GHG emissions include a variety of compounds, most notably CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O. However, for on-road tailpipe emissions, CO<sub>2</sub> is by far the most significant contributor to GHG emissions. For purposes of comparing GHG emissions, the overall GHG emissions associated with BVM's existing guests are assumed to consist entirely of CO<sub>2</sub>. The CO<sub>2</sub> emissions were calculated from the fuel usage of vehicles traveling to and from BVM, based on the average fuel economy data (i.e., miles per gallon of fuel) published by the EPA.<sup>16</sup> Since the majority of BVM's guests do not stay overnight, these visitors were assumed to travel round-trip each day from across the region with an average daily round trip of 200 miles. The CO<sub>2</sub> emission factors (e.g., CO<sub>2</sub> emitted per gallon of gasoline burned) were then applied to the calculated total fuel usage to get the CO<sub>2</sub> emissions emitted from motor vehicles traveling to utilize BVM facilities. The detailed quantification is located in the Project File.

Based on the above assumptions and using BVM's ten-year average annual visitation 129,000 (between 2000/1 through 2009/10 – refer to Table 1-1), it is estimated that the annual GHG emissions generated by BVM visitors from mobile sources is approximately 5,050 metric tons CO<sub>2</sub> equivalent (CO<sub>2</sub>e), or approximately 42 metric tons CO<sub>2</sub>e/day, to the local and regional environment.<sup>17</sup> For clarity, this calculation also includes motor vehicle emissions generated by BVM's destination guests and as they drive from the Bay Area or other origination points to visit BVM. For comparison, BVM has not exceeded 180,000 annual visits since the 1992/93 season. Compared to the recent 10-year average of 129,000 annual visits, this represents a 40% decline in visitation. It is acknowledged that other sources of GHG emissions are present at BVM (e.g., grooming equipment, emissions associated with heating and cooking fuels, and snowmobiles). The majority of GHG emissions are produced by vehicle trip generation specific to the day use of the ski area. Additionally, GHG emissions created by vehicle trips are more accurately calculated than other sources.

<sup>15</sup> Information provided by BVM management.

<sup>16</sup> EPA Office of Transportation and Air Quality developed *Emission Facts: Average Carbon Dioxide Resulting from Gasoline and Diesel Fuel, 2005*, to ensure consistent assumptions and practices in the calculation of emissions of greenhouse gases from transportation and mobile sources. It is intended to be used as a reference for estimating emissions from mobile sources. Based on this fact sheet, a gallon of diesel fuel emits approximately 22.2 lbs CO<sub>2</sub>. A gallon of gasoline emits approximately 19.4 lbs CO<sub>2</sub>.

<sup>17</sup> "CO<sub>2</sub>e is a metric used to compare the emissions from various greenhouse gases based upon their global warming potential." (EPA, 2011)

The average fuel economy was based on the EPA average for passenger cars and light duty trucks. The assumed fleet average was 20.4 miles per gallon.<sup>18</sup> It is important to note that future fleet-average fuel economy will improve as new Corporate Average Fuel Economy (CAFE) standards are enacted. The Energy Independence and Security Act signed into law on December 19th, 2007, mandates a 40% increase in fleet-average fuel economy by 2020, equal to 35 miles per gallon.<sup>19</sup>

## **FACILITIES**

A carbon footprint calculator is available through CoolCalifornia.org, which is a joint project of the California Air Resources Board, the California Energy Commission, the Berkeley Institute of the Environment, the Lawrence Berkeley National Laboratory, and Next Ten. This tool was used to model the existing carbon footprint of BVM's facilities and operations, measured as metric tons of CO<sub>2</sub>e, emitted by BVM, using the existing day lodge as a surrogate measure. For purposes of the analysis, the following assumptions were used to model the CO<sub>2</sub>e emissions of BVM:

- 50 employees are employed at the Bear Valley Lodge
- 60,000 square foot facility
- 6 month operating season from November to April
- 25-percent upward adjustment in the result for operation in an alpine environment

Based on the assumptions described above, the estimated GHG emissions currently generated by BVM facilities/operations at approximately 840 metric tons CO<sub>2</sub>e. This information is detailed below in Table B-4.

## **Environmental Consequences**

### ***Direct and Indirect Effects***

#### **ALTERNATIVE 1 (NO ACTION)**

Under the No Action alternative, no new projects would be implemented at BVM. GHG emissions and air quality impacts would be associated with maintaining the existing operation, including the lifts and ski trail network and associated infrastructure. No project related changes would occur to the current trends in air quality. There would be no new projects approved under Alternative 1, therefore no new short-term construction related greenhouse gases would be emitted. It is likely that BVM's annual visitation would continue to average 129,000 under Alternative 1.

In total, guests visiting BVM under Alternative 1 would be estimated to continue contributing approximately 5,050 metric tons of CO<sub>2</sub>e annually or approximately 42 metric tons CO<sub>2</sub>e daily (refer to Table B-4) as in the Existing Condition. People living/staying in the Village would continue to be required to drive to the ski area or take the shuttle to access ski area facilities. With the selection of Alternative 1, there would be no change in current trends to air quality in and around BVM.

#### **ALTERNATIVE 2 (PROPOSED ACTION)**

Air quality impacts associated with Alternative 2 were calculated based on historic peak visitation levels last experienced at BVM during the 1980s, which averaged 180,000 visits/year. Since then, BVM has experienced a steady decline in annual visitation attributable to a lack of capital investment and incremental improvements, combined with an infusion of capital at competing Lake Tahoe area resorts, including new buildings, lifts, terrain accommodations and guest services. The baseline annual visitation at BVM used for this air quality analysis was 129,000, but with implementation of the proposed projects, it is logical to assume that BVM could once again experience average annual

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<sup>18</sup> In 2007, the weighted average combined fuel economy of cars and light trucks combined was 20.4 miles per gallon. (FHWA, 2008)

<sup>19</sup> Pub. L. 110 – 140 Energy Independence and Security Act of 2007

visitation in the 180,000 range. This represents a potential 40% increase in annual visitation above the baseline.

Compared to the baseline conditions in Alternative 1, increased GHG emissions would be expected to occur as a result of additional annual visitation (i.e., vehicles) and construction/use of the proposed Bear Top Lodge. The results of GHG modeling are provided in Table B-4. In total, implementation of Alternative 2 has been modeled to emit approximately 8,642 metric tons of CO<sub>2</sub>e – an increase of approximately 2,797 metric tons (or 48%) over Alternative 1.

Table B-4: GHG Emissions Summary – Alternatives 1, 2 and 3

| Emissions Source                                 | Alternative 1 (Baseline) | Alternative 2                             | Alternative 3                             |
|--------------------------------------------------|--------------------------|-------------------------------------------|-------------------------------------------|
| <i>Long Term Emission Sources (metric tons)</i>  |                          |                                           |                                           |
| Existing Day Lodge                               | 840                      | 840                                       | 840                                       |
| Vehicles                                         | 5,050                    | 7,634<br>(51% increase over Alt 1)        | 7,634<br>(51% increase over Alt 1)        |
| Proposed Bear Top Lodge                          | 0                        | 168                                       | 168                                       |
| <b>Total GHG Emissions (metric ton)</b>          | <b>5,845</b>             | <b>8,642</b><br>(48% increase over Alt 1) | <b>8,642</b><br>(48% increase over Alt 1) |
| <i>Short-term Emissions Sources (metric ton)</i> |                          |                                           |                                           |
| Construction Vehicles                            | 0                        | 80                                        | 80                                        |

Were BVM to implement all proposed projects, and should resulting annual future visitation average 180,000 (as modeled), this would represent BVM reclaiming annual visitation that it previously experienced back in the 1980s. Therefore, this is not considered “new” visitation (or GHG emissions), but rather, a reestablishment of BVM’s previous annual visitation benchmark, with commensurate GHG emissions.

Compared to Alternative 1, a 51-percent increase in vehicular-related GHG emissions is anticipated in association with additional visitation expected as a result of proposed projects. However, it is anticipated that the proposed Village Lift would reduce the number of vehicle trips made between Bear Valley Village and BVM.

Alternative 2 also includes the construction of the Bear Top Lodge. Using the same carbon footprint calculator used to model the existing Bear Valley Lodge, several assumptions were made to determine the amount of CO<sub>2</sub>e that the new Bear Top Lodge would generate. For the analysis it is assumed that the lodge would employ 10 employees in a 10,000 square foot facility over a six month operating season. It is further assumed that the facility would generate 25% more emissions for operations in an alpine environment. This upward adjustment is due to the low temperatures experienced at this elevation and the heat loss from frequent door opening as ski area guests access the facility. Based on these assumptions the proposed Bear Top Lodge would contribute approximately 168 metric tons CO<sub>2</sub>e over the course of an operating season (Table B-4).

As discussed previously under the Climate Change heading, the 2009 Forest Service Washington Office guidance states that “... if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO<sub>2</sub>-equivalent GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. For long-term actions that have annual direct emissions of less than 25,000 metric tons of CO<sub>2</sub>-equivalent, CEQ encourages Federal agencies to consider whether the action’s long-term emissions should receive similar analysis.” *Air quality modeling*

*completed for this analysis clearly indicates that increased GHG emissions over the baseline would be well below the 25,000 metric ton threshold identified by the Forest Service's Washington Office.*

Short-term effects to air quality would stem from an increase in particulate matter generated during construction activities (i.e., as fugitive dust or vehicle emissions). Short-term, adverse air quality effects due to construction-generated dust would be minimized by watering of the areas of disturbance during, and immediately after, construction. All disturbed ground would be revegetated by seeding and mulching promptly after the disturbance occurs to help reduce the duration and extent of soil exposure. Refer to the management requirements in Chapter 2 for mitigation and BMPs specific to air resources.

Short term, construction related emissions were modeled to determine the amount of CO<sub>2</sub>e that would be generated by workers accessing the site to implement projects. For purposes of this analysis the following assumptions were made for construction equipment:

- There would be six employee trucks used to access the project sites;
- Employees would be housed in Bear Valley Village during construction;
- Each vehicle would travel 10 miles round trip/day;
- There would be a 5-day operating week and a 12-week construction window;
- Employee trucks average 15 miles per gallon;
- Construction equipment would consist of two front-end loaders, one track-hoe and a dump truck burning a total of four gallons of diesel per hour per vehicle of vehicle operation.

The EPA has calculated that the CO<sub>2</sub>e emission from the combustion of a gallon of diesel fuel is 22.2 pounds of CO<sub>2</sub>e per gallon. From this data it is possible to estimate the CO<sub>2</sub>e contribution of heavy equipment that would be used to implement the Proposed Action using the assumptions listed above. Over the lifespan of the project each piece of heavy equipment would burn approximately 1,920 gallons of diesel fuel. This would result in an additional 77.3 metric tons CO<sub>2</sub>e entering the local environment. For comparison, the EPA estimates that the average annual household emissions in the United States are approximately 11.3 metric tons CO<sub>2</sub>e.<sup>20</sup> The carbon footprint calculator (available through CoolCalifornia.org) was used to model employee vehicle CO<sub>2</sub> contributions as employees travel from their temporary housing in Bear Valley Village to project sites. This amount was calculated to be approximately 3 metric tons CO<sub>2</sub>e over the project's expected construction window. In total, implementation of Alternative 2 would result in a temporary impact of approximately 80 metric tons of CO<sub>2</sub>e. Following completion of construction activities, this source of CO<sub>2</sub>e would no longer be present.

Under Alternative 2, BVM would construct the *Village Lift*. The *Village Lift* would be powered by an electric drive and would provide lift-served access from Bear Valley Village to the ski resort. Residents and visitors of the Village would have the option to ride the chairlift, ride the shuttle, or drive to the base area via the highway. As previously discussed, it is anticipated that Village residents and visitors would choose to use the new lift rather than drive to the ski area. This would result in a decrease of vehicle emissions during winter operations. Continued implementation of BVM's Environmental Action Plan would reduce operational emissions at the ski area. Example actions include increasing use of biodiesel and converting to more efficient engines in snowmobiles.

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<sup>20</sup>Environmental Law Resource. <http://www.environmentallawresource.com/2009/03/articles/climate-change/dodging-the-bullet-advice-to-facilities-whose-emissions-may-be-under-the-reporting-threshold-of-usepas-proposed-mandatory-ghg-inventory-reporting-regulations/>. Last accessed July 21, 2010.

**ALTERNATIVE 3 (IMPROVED SKIER CIRCULATION)**

Impacts to the local and regional climatic regime under Alternative 3 are anticipated to be identical to the impacts described under Alternative 2 (Table B-4). There would be less short-term air quality impacts (i.e., dust generation) as *Bono’s Alley* would not be constructed. Construction of two lifts between Bear Valley Village and BVM would have almost identical impacts as the single lift configuration in Alternative 2, and Village residents and visitors would in most cases choose to use the new lifts rather than drive to the ski area. Both action alternatives include the construction of Bear Top Lodge, therefore the CO<sub>2</sub>e contributions would be the same in Alternative 2 and 3 from the proposed lodge.

**Cumulative Effects**

Given what is known and what is not known about global climate change, the following discussion outlines the cumulative effects of this project on greenhouse gas emissions and the effects of climate change on forest resources.

Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>) and Nitrous Oxide (N<sub>2</sub>O) emissions generated by motor vehicles are expected to contribute to the global concentration of greenhouse gases that affect climate change. Projected climate change impacts include air temperature increases, sea level rise, changes in the timing, location, and quantity of precipitation, and increased frequency of extreme weather events such as heat waves, droughts, and floods. The intensity and severity of these effects are expected to vary regionally and even locally, making any discussion of potential site-specific effects of global climate change on forest resources speculative.

Table B-5: Projects Identified for Consideration in Cumulative Effects

| Project Number | Project                               | Timeframe              | Area (acres) |
|----------------|---------------------------------------|------------------------|--------------|
| 1              | Hazard Tree Management                | Present                | 218          |
| 2              | Bear Valley Timber Stand Improvement  | Reasonably Foreseeable | 250          |
| 3              | Motorized Travel Management           | Present                | n/a          |
| 4              | Round Valley Trailhead Improvement    | Reasonably Foreseeable | 1            |
| 5              | Bloods Ridge Timber Stand Improvement | Reasonably Foreseeable | 19           |
| 6              | Bear Valley Village Development       | Reasonably Foreseeable | 18.4         |

Table B-5 identifies past, present, and reasonably foreseeable projects have been identified within the vicinity of BVM for consideration in the analysis of cumulative effects to GHG emissions. It should be noted that additional phases of the BVM MDP, as programmatically approved in the 1995 Bear Valley FEIS/ROD, could be implemented in the future based on further site-specific NEPA analysis. At this time, no specific projects from the MDP have been proposed for consideration under site-specific NEPA approval. Future projects may include additional tree removal in East Bowl for the construction of additional chairlifts, ski trails, a new day lodge, and parking.

Projects 1-5 (Table B-5) would likely contribute to short-term increases in emissions from construction equipment. However, these actions are expected to be short in duration (e.g., one construction season) and would therefore not contribute to long terms changes in air quality in the vicinity of BVM. Other activities in the vicinity of the project area which are likely to contribute to airborne particulates and visibility impairment in the analysis area include general vehicular traffic,

smoke from domestic wood stoves and fireplaces, construction, wildfires, and off road vehicles (e.g., snowmobiles, ATVs).

The proposed Bear Valley Village Development (Project 6, Table B-5) will occur on private lands and is considered as a cumulative impact. It is anticipated that this proposed development would increase visitation to the Village and the ski area. The Bear Valley Village Development is undergoing a separate environmental approval process through Alpine County. As lead agency, Alpine County has prepared an Environmental Impact Report (EIR) under the California Environmental Quality Act and according to policies governing private lands. The proposed expansion would add approximately 491 residential units and associated facilities that would be consistent with current planning parameters for the town (SWCA 2008). According to the EIR, the proposed Bear Valley Village Development would result in unavoidable increase in GHG emissions due to project construction (6,500 CO<sub>2</sub>e) and subsequent increases in visitation (7,400 metric tons CO<sub>2</sub>e/year) to Village facilities (SWCA 2008). The project's incremental contributions to GHG emissions represent 0.001% of total statewide emissions and annual operations of the project would represent 0.0015% of the state emissions. The Action Alternatives for BVM Expansion are designed to accommodate the current and future visitation. Under the Action Alternatives, operation of the transportation lift(s) and existing shuttle system would reduce the need for ski area users to drive to parking facilities thereby reducing vehicle emissions.