HEAVENLY MOUNTAIN RESORT
2010 CAPITAL PROJECTS
ENVIRONMENTAL ASSESSMENT

MARCH 2010

USDA FOREST SERVICE
LAKE TAHOE BASIN MANAGEMENT UNIT

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Heavenly Mountain Resort 2010 Capital Projects
Environmental Assessment
Lake Tahoe Basin

Proposed Action:
Heavenly Mountain Resort

Location:
Lake Tahoe Basin Management Unit
Eldorado and Alpine County, CA
and Douglas County, NV

Lead Agency:
USDA Forest Service
Aspen-Sopris Ranger District
White River National Forest
Pitkin County, Colorado

Responsible Official:
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Lake Tahoe Basin
South Lake Tahoe, CA

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Abstract: Heavenly Mountain Resort (Heavenly) is located in the Lake Tahoe Basin Management Unit (LTBMU) spanning Eldorado and Alpine Counties in California, and Douglas County in Nevada. Heavenly operates in accordance with the terms and conditions of a 40-year Ski Area Term Permit issued by the USDA Forest Service (Forest Service). This Environmental Assessment (EA) has been prepared to analyze a proposal designed to respond to current and anticipated consumer demands for public enjoyment and operational efficiencies on lands within Heavenly's special use permit (SUP) area. The purpose of the proposed improvements is to improve the overall quality of the visitor experience through enhanced on-mountain facilities and operations. This would be accomplished through the following projects: 1) Constructing an appropriately sized lodge near the top terminal of the Gondola; 2) Providing additional seating in a popular area known as Snow Beach; 3) reducing the amount of snow needed to adequately maintain and operate *California Trail* 4) upgrade the Galaxy lift and implement additional trails and snowmaking within the pod. This EA discusses the Purpose and Need for the proposal, the process used to develop alternative, potential direct, indirect, and cumulative impacts of implementing the No Action Alternative (Alternative 1) and the Proposed Action (Alternative 2) and project design features (PDF).

Following review of the EA, as well as review of public and agency comments on the EA, the Forest Supervisor will make a final determination as to which alternative best serves the public interest on National Forest System lands. The Selected Alternative can be a modification of alternatives presented.

Important Notice: Reviewers should provide the Forest Service with their comments during the review period for the EA. This will enable the Forest Service to analyze and respond to the comments at one time, and to use the acquired information in the preparation of subsequent documentation, thus avoiding undue delay in the decision-making process. Comments on the EA should be specific and should address the adequacy of the EA and the merits of the alternatives discussed (36 CFR 215.14). Comments received, including the names and addresses of those who comment, will become part of the public record for this project and will be subject to review pursuant to the Freedom of Information Act.

Comment Period: The comment period for the EA will extend 30 calendar days following publication of the notice in the Tahoe Daily Tribune. The publication date in the newspaper of record is the exclusive means for calculating the comment period for this proposal. Please send comments to Terri Marceron, Forest Supervisor, Re: Heavenly Projects, Lake Tahoe Basin Management Unit, 35 College Dr., South Lake Tahoe, CA 96150, or comments-pacificsouthwest-LTBMU@fs.fed.us (Please put "Heavenly's 2010 Capital Projects" in the subject line.)

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LIST OF ACRONYMS

ABA	Architectural Barriers Act
ADA	Americans with Disabilities Act
AF	Acre-feet
A-F/Y	Acre-feet per year
A-F/A/Y	Acre-feet per acre per year
APE	Area of Potential Effect
BA	Biological Assessment
BE	Biological Evaluation
BEIG	Built Environment Image Guide
BMP	Best Management Practice
CCC	Comfortable Carrying Capacity
CDA	Connected Disturbed Area
CDRG	California Department of Fish and Game
CERP	Construction Erosion Reduction Program
CEQ	Council on Environmental Quality
CFM	Cubic Feet per Minute
CFR	Code of Federal Regulations
cfs	Cubic Feet (of water) per Second
CNDDB	California Department of Fish and Game Diversity Database
CWA	Clean Water Act
CWE	Cumulative Watershed Effects
CWD	Course Woody Debris
DAU	Data Analysis Unit
DBH	Diameter at Breast Height
DN	Decision Notice
DRI	Desert Research Institute
EA	Environmental Assessment
EIS	Environmental Impact Statement
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESRHR	Easy Street Run Hazard Reduction
FEIS	Final Environmental Impact Statement

FONSI	Finding of No Significant Impact
FPCA	Forest Plan Consistency Analysis
FR	Federal Register
FSH	Forest Service Handbook
FSM	Forest Service Manual
FWD	Fine Woody Debris
GIS	Geographic Information System
GPD	Gallons per Day
GPM	Gallons per Minute
GPS	Global Positioning System
GVU	General Vegetation Unit
HABCAP	Habitat Capability Model
HCI	HABCAP Model Habitat Capability Index
IDT	Interdisciplinary Team
IF	Isolated Find
LAA	Landscape Assessment Area
LAU	Lynx Analysis Unit
LCAS	Canada Lynx Conservation Assessment and Strategy
LRWQCB	Lahontan Regional Water Quality Control Board
LRMP	Land and Resource Management Plan
LTBMU	Lake Tahoe Basin Management Unit
LWD	Large Woody Debris
mg/l	Milligrams Per Liter
MIS	Management Indicator Species
MMP	Mountain Master Plan
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MSIM	Multiple Species Inventory and Monitoring
NDIS	Natural Diversity Information System
NDT	Non-Destructive Testing
NEPA	National Environmental Policy Act (1970)
NFS	National Forest System
NHPA	National Historic Preservation Act (1966)
NRCS	National Resources Conservation Service

NRHP	National Register of Historic Places
OAHP	Office of Archaeology and Historic Preservation
PAC	Protected Activity Center
PDF	Project Design Feature
PEM	Palustrine Emergent
PPH	People per Hour
PSS	Palustrine Shrub Scrub
R2	USFS Region Two Sensitive Species
RGL	Regulatory Guidance Letter
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
SEZ	Stream Environment Zone
SH	State Highway
SHPO	State Historic Preservation Officer
SIO	Scenic Integrity Objectives
SIR	Supplemental Information Report
SMS	Scenery Management System
SOC	Species of Concern
SUP	Special Use Permit
T&E	Threatened and Endangered
TEP	Threatened, Endangered, and Proposed
TEUI	Terrestrial Ecological Unit Inventory
TMDL	Total Maximum Daily Load
TMP	Travel Management Plan
TRPA	Tahoe Regional Planning Agency
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
µg/m3	Micrograms per Cubic Meter
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCA	United States Code Annotated
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFS	US Forest Service

USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
USLE	Universal Soil Loss Equation
WCPH	Watershed Conservation Practices Handbook
WEPP	Water Erosion Prediction Project
WOUS	Waters of the U.S.
WQCC	Water Quality Control Commission
WRIS	Wildlife Resource Information System

Chapter 1
Purpose and Need

1. PURPOSE AND NEED

A. SUMMARY

The Lake Tahoe Basin Management Unit (LTBMU) of the United States Department of Agriculture, Forest Service (Forest Service) has accepted a proposal from Heavenly Mountain Resort (Heavenly) for its planned 2010 Capital Projects, which are intended to accomplish Heavenly's objectives of improving existing facilities and infrastructure for more efficient and enjoyable use by the recreating public. Chapter 2 provides a full description of the two alternatives analyzed in this Environmental Assessment: the Proposed Action and the No Action Alternative.

All projects included in the Proposed Action are within Heavenly's Special Use Permit (SUP) area, which is administered by the LTBMU. The Proposed Action is consistent with Heavenly's accepted 2007 Master Plan Amendment (MPA 07). Heavenly is prepared to begin implementing any approved projects in summer 2010.

The 2010 Capital Projects are directly linked to Heavenly's MPA 07, the purpose of which is:

> *"to improve the overall quality of the visitor experience at the resort, creating an improved, multi-seasonal visitor and skier/snowboarder experience that is competitive with the experience offered by other destination resorts and that reflects current market trends and preferences."*

Based upon the disclosure of effects presented in this Environmental Assessment (EA), the Responsible Official (the LTBMU Supervisor) will decide whether or not to authorize the Proposed Action (in whole or in part) or the No Action Alternative.

B. INTRODUCTION

DOCUMENT STRUCTURE

The proposed improvements constitute a federal action, which has the potential to affect the quality of the human environment on public lands administered by the Forest Service. Therefore, the proposal must be analyzed pursuant to the National Environmental Policy Act (NEPA). Under NEPA, federal agencies must carefully consider environmental concerns in their decision making process and provide relevant information to the public for review and comment. Therefore, the Forest Service has prepared this EA in compliance with NEPA and other relevant federal and state laws and regulations. This EA discloses the direct, indirect, and cumulative environmental effects that are anticipated to result from proposed activities. The document is organized into four chapters:

- *Chapter 1 – Purpose and Need*: This chapter includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that

purpose and need. This chapter also details how the Forest Service informed the public of the proposal and how the public responded.

- *Chapter 2 – Alternatives, Including the Proposed Action*: This chapter provides a more detailed description of the agency's Proposed Action as well as a description of the required No Action Alternative. This discussion also includes Project Design Features and Best Management Practices that have been carried forward through the analysis. Finally, Chapter 2 provides a summary table of the environmental consequences associated with each alternative.

- *Chapter 3 – Affected Environment and Environmental Consequences*: This chapter describes the environmental effects of implementing the Proposed Action and No Action Alternative. Chapter 3 is organized by resource area.

- *Chapter 4 – Agencies and Persons Consulted*: This section provides a list of preparers and agencies consulted during the development of the environmental assessment.

Additional documentation may be found in the project planning record located at the Lake Tahoe Basin Management Unit in South Lake Tahoe, CA.

BACKGROUND

Heavenly is located in both California and Nevada, spanning three counties (Eldorado and Alpine Counties in California, and Douglas County in Nevada). The majority of Heavenly's lift and terrain network is on National Forest System (NFS) lands administered by the LTBMU, with the remainder on private lands owned by Heavenly. The NFS portions of Heavenly are administered under a 40-year ski area special use permit (SUP) by the LTBMU. The SUP area encompasses approximately 7,020 acres of NFS lands.

Heavenly's unique physical and political setting subjects all of its activities to extensive, multi-level review and approval by numerous entities, including: the LTBMU; the Tahoe Regional Planning Agency (TRPA); Douglas County, NV; and El Dorado and Alpine Counties, CA. In addition, all other applicable federal, state and local laws, rules, regulations, plans and policies apply.

With base elevations of 6,540 feet and 7,200 feet in California and Nevada, respectively, and a summit elevation of 10,067 feet, Heavenly has a total vertical elevation change of over 3,500 feet. The resort offers approximately 4,800 skiable acres, 29 lifts, and 94 trails.

2007 MASTER PLAN AMENDMENT

According to the terms of its SUP, Heavenly is required to provide the Forest Service with a Master Development Plan to outline future projects and operations on NFS lands. In 2005, an amendment to Heavenly's Master Plan (MPA 05) resulted in the preparation of a comprehensive, multi-jurisdictional

environmental analysis to satisfy the requirements of California Environmental Quality Act (CEQA), NEPA, and TRPA regulations. This three-tier document—a 2007 Environmental Impact Report/Environmental Impact Statement/Environmental Impact Statement (2007 EIR/EIS/EIS)—analyzed the potential effects of the MPA 05 on the human and biological environment that satisfied the needs of the TRPA, Forest Service, Alpine County and El Dorado County, respectively.[1]

The 2007 EIR/EIS/EIS analyzed Phase I projects site specifically, while Phase II and III projects were analyzed at the programmatic level. The 2007 EIR/EIS/EIS was reviewed to make decisions based on each respective agency's planning policies and statutory requirements.

A summary of the MPA 05 approval from each of the three agencies is included below. *Note that the result of the approval was a finalized Master Plan Amendment, referred to as the MPA 07.*

Lake Tahoe Basin Management Unit

For the LTBMU, the Final EIS fulfilled the requirements of NEPA at the site specific level for Phase I projects. The June 2007 Record of Decision signed by the Forest Supervisor documents the decision for Phase I Projects only, indicating that Phase II and III projects will require site-specific NEPA analysis prior to their implementation. Therefore, the decision did not include any Phase II or III project approvals. Alternative 5, with modifications, was the Selected Alternative.

The Phase I projects that were approved in the Selected Alternative are identified later in this EA, in the Introduction to Chapter 3 under "Past, Present, and Reasonably-Foreseeable Future Projects."

The 2010 Capital Projects were programmatically analyzed in the 2007 EIR/EIS/EIS but require site specific approval through NEPA.

Tahoe Regional Planning Agency

For the TRPA, the FEIS is the environmental document on which their Governing Board based its approval of the MPA 05, site specifically for Phase I projects, and programmatically for Phases II and III. On April 28, 2007, the Governing Board approved the programmatic level MPA 05, project level permits for projects listed in Phase I, and several required amendments to their Plan Area Statements.

El Dorado and Alpine Counties

El Dorado County is the CEQA Lead Agency together with Alpine County. By analyzing the EIR as the environmental review, Alpine County amended their General Plan, including:

[1] Douglas County, Nevada was involved by reviewing the environmental documents and providing comments, but had no environmental documentation requirements pertaining to the MPA 05.

- Change the existing land use designation applicable to the Alpine County portion of Heavenly from Open Space to Recreational Site.
- Change the existing zoning classification from Agriculture to Agriculture-Commercial Recreation combined.

C. PURPOSE AND NEED FOR ACTION

The 2010 Capital Projects are directly linked to Heavenly's MPA 07, the purpose of which is:

> *"to improve the overall quality of the visitor experience at the resort, creating an improved, multi-seasonal visitor and skier/snowboarder experience that is competitive with the experience offered by other destination resorts and that reflects current market trends and preferences."*

The Purpose and Need section of the 2007 Final EIS (page 1-4), states: "All of the overall MPA 07 projects and those projects which are ready for immediate implementation are linked to the same purpose and need for action…" Therefore, because the Purpose and Need of Heavenly's 2010 Capital Projects is tied to the 2007 Final EIS (which analyzed the entire MPA 07 programmatically), this document incorporates Section 1.3 of the 2007 Final EIS by reference.

The Purpose and Need of each of the proposed 2010 Capital Projects is detailed herein.

#1 Given the importance of the top of the Gondola area for year-round operations, an appropriately sized and located on-mountain guest services facility is needed.

Heavenly's MPA 07 identifies the top of the Gondola as Heavenly's predominant destination access point—roughly 40 percent of skiers and riders, and all of summer guests, access the mountain from the Gondola. The top of the Gondola is a focal point for summer and winter activities, hosting Adventure Peak and teaching terrain, restrooms, as well as the Tamarack Express and Big Easy lift.

Given the importance of this area for Heavenly's operations, current guest service facilities at the top of the Gondola are inadequately limited to the Umbrella Bar, which does not provide indoor seating or guest services. Therefore, during periods of cold temperatures and inclement weather, resort visitors do not have an opportunity to get inside to eat, relax, or escape the elements.

Given the guest services situation at the top of the Gondola, beginner level guests must download the Gondola for access to indoor facilities in Heavenly Village. More experienced skiers and riders can disperse across the mountain to locations with indoor guest service facilities. However, due to the limited number of on-mountain, indoor seats (approximately 1,060) across Heavenly, these facilities often experience crowding.

Constructing an appropriately sized and strategically located guest services facility at the center of all activities at the top of the Gondola area is necessary to accommodate existing and future visitor use

patterns, and to maintain the quality of services that skier and riders have come to expect. This facility would also maintain beginner-level ski school opportunities at the top of the Gondola.

#2 Provide additional seating at Snow Beach.

Snow Beach is a snack bar located at the base of *Patsy's* and *Maggie's* trails and serves visitors using *Patsy's* trail as well as those returning from upper portions of the California side of the resort with restrooms and food service. The existing facility is approximately 790 square feet and serves a limited function, with 80 outdoor seats and no indoor or covered seats.

Consistent with the MPA 07, the installation of a seasonal, open-air shelter is intended to accommodate additional seating, as well as food service and barbeque equipment, at this important location.

#3 Reduce the height of natural features on California Trail, which requires substantial amounts of natural snow in order to be used.

California Trail is an important component of the intermediate skiing and riding experience at Heavenly. This high-capacity, intermediate trail is easily accessible from the top of the Gondola area and is served by a single lift—the Tamarack Express.

Due to the topography, soils and geology throughout the Heavenly SUP area, large boulders and downed trees within developed trails present unique challenges when it comes to opening terrain for skiing and riding each season. *California Trail* is a good example of this—currently, the height of natural features such as boulders and downed trees require up to 5 feet of snow coverage before *California Trail* can be opened. Therefore, in the early season and during low-snow years, Heavenly focuses a great deal of energy and water resources on making snow on *California Trail*. This is illustrated in Photo 1-1, which is looking up *California Trail* from where it empties into the top of the Gondola area.

Photo 1-1:
California Trail

Selectively removing some of these natural features, while protecting soil resources, would reduce the amount of natural and man-made snow that is necessary to open this trail, and would thus save energy and water that Heavenly currently diverts to snowmaking.

#4 Encourage repeat use of the Galaxy Pod.

The Galaxy pod consists of one fixed-grip double chairlift (Galaxy) and two trails—Perimeter (U1) and Galaxy (U2)—on the Nevada side of the resort.[2]The MPA 07 calculated the capacity of the Galaxy lift at 613 guests.[3] Due to the limited amount of terrain and long lift ride (12.5 minutes), the Galaxy Pod is underutilized, while pods with similar Intermediate terrain—such as Stagecoach and Dipper Express (both high-speed, detachable quads)—experience crowding. Wait times can approach 25 minutes at the Dipper Express and 12 minutes on the Stagecoach Express during busy periods.

Currently there is no snowmaking in the Galaxy Pod; therefore opening these two trails is often delayed as compared to other Intermediate terrain across the SUP area where snow can be made to provide adequate cover.

[2] A "pod" is defined by a lift and the terrain that is able to be round-trip skied by it.
[3] Heavenly Mountain Resort, 2007

Replacing the Galaxy Lift with a new high-speed, detachable quad, in conjunction with additional terrain to match the added capacity of the high-speed lift and snowmaking, is intended to re-energize this underutilized portion of the resort. It would also enhance skier/rider circulation between the Stagecoach Pod and the Galaxy Pod.

D. PROPOSED ACTION

The Proposed Action is summarized here, and is described in detail in Chapter 2 of this document. It includes:

- A new day lodge with 488 indoor seats would be located near the top of the gondola. Construction of the new lodge would include: moving utilities, summer maintenance road relocation, relocating the magic carpet lift, and leveling the area in front of the Tamarack lift.
- Relocation of the Umbrella Bar from the top of the Gondola to Snow Beach
- Reduction of natural obstacles (defined as the "Easy Street Run Hazard Reduction Prescription") on a segment of the *California Trail* to minimize the amount of natural snow and snowmaking needed to provide adequate coverage
- Improvements to the Galaxy pod, including:
  - Replace the Galaxy fixed-grip double chairlift with a high-speed detachable quad
  - Construct four new trails, with below-ground snowmaking
  - Add below-ground snowmaking to existing trails U1 and U2 in the Galaxy pod

E. MANAGEMENT DIRECTION

1988 LTBMU LAND AND RESOURCE MANAGEMENT PLAN DIRECTION

The LTBMU's 1988 Land and Resource Management Plan (1988 Forest Plan) provides management direction for all NFS lands within the jurisdiction of the Forest. The 1988 Forest Plan divides lands within the jurisdiction of the LTBMU into 21 management areas based upon the characteristics of the land and either existing patterns of use or potential future opportunities. The Heavenly SUP area is in the Heavenly Valley Management Area, with an "Alpine skiing" management emphasis. Forest-wide, as well as Management Area, standards and guidelines are identified throughout the 1988 Forest Plan; these provide the management direction for projects and programs.

The desired future condition of the Heavenly Valley Management Area is "a quality ski resort with ski runs and other disturbed areas stabilized to reduce the potential for soil erosion."[4]

[4] USDA Forest Service 1988, page IV-106

Upon receipt of the 2010 Capital Projects proposal from Heavenly, the LTBMU conducted a thorough consistency review based on Forest-wide and Heavenly Valley Management Area standards and guidelines contained within the 1988 Forest Plan. Based on that analysis, LTBMU specialists identified some minor inconsistencies, which led to some slight modifications to the Proposed Action. The Proposed Action analyzed within this EA is fully consistent with the 1988 Forest Plan.

F. DECISION FRAMEWORK

LAKE TAHOE BASIN MANAGEMENT UNIT

This EA is not a decision document. Rather, it documents the site-specific environmental analysis for the range of alternatives. The responsible official for this project is the LTBMU Forest Supervisor. Based on the analysis documented within this EA, the responsible official will decide whether to approve, in whole or in part, the Proposed Action or the No Action Alternative and whether a Finding of No Significant Impact (FONSI) can be supported. A Decision Notice will document the responsible official's decision. Should components of the 2010 Capital Projects be approved for implementation, the Forest Supervisor will also specify site-specific project design features, best management practices, and/or mitigation measures that may be required.

TAHOE REGIONAL PLANNING AGENCY

Approximately 6,470 acres of Heavenly is within the Lake Tahoe Basin and therefore is under the jurisdiction of the TRPA. Of the four projects analyzed in this EA, two would occur within the Lake Tahoe Basin—construction of the Gondola Lodge and associated ground disturbance, and the Easy Street Run Hazard Reduction (ESRHR) Prescription on a segment of the *California Trail*. As such, the TRPA Governing Board will decide:

- Whether the construction of the lodge and the ESRHR Prescription is consistent with the TRPA Regional Plan;
- Whether to certify the pertinent portions of the EA; and
- Whether to adopt the proposed projects or an alternative.

Prior to certification of in-basin projects in the Final EA, TRPA's Advisory Planning Commission (APC) reviews the Final EA and makes a recommendation to the Governing Board on certification of in-Basin projects. Projects approved by the Governing Board shall be issued a permit prior to construction.

El Dorado, Alpine and Douglas County Jurisdiction

County jurisdiction at Heavenly is limited to private land in the California Base Area; however, construction of the lodge would require a building permit from El Dorado County.

G. PUBLIC INVOLVEMENT

The proposal was first listed in the LTBMU's quarterly Schedule of Proposed Actions on October 1, 2009. A scoping notice that detailed the proposal was provided to the public and other agencies for comment beginning on November 30, 2009. Twenty-three letters were received by the LTBMU during the scoping period.

Aside from interested individuals, formal input was received from the following organizations and agencies.

- The League to Save Lake Tahoe
- The Lahontan Regional Water Quality Control Board
- Nevada Division of Water Resources
- Nevada State Historic Preservation Office
- Lake Tahoe South Shore Chamber of Commerce

H. ANALYSIS FRAMEWORK

The Forest Service separated the comments into three groups: (1) Non-Significant Issues, (2) Issues considered but eliminated from detailed study, and (3) Issues.

- **Non-Significant Issues** do not meet the Purpose and Need for the project; are outside the scope of the proposed action; are already decided by law, regulation, or Forest Plan; are not supported by scientific evidence; are addressed by project design features; or are addressed by additional information or clarification of the proposed action. Non-Significant issues also represent opinions and statements which do not present problems or alternatives.
- **Issues considered but eliminated from detailed study** meet the Purpose and Need for the project but were considered in alternatives already studied and eliminated, or additional project design features were developed which reduced or eliminated the effects.
- **Issues** are relevant to the Purpose and Need for action in terms of the extent of the geographic distribution, the duration of effects, or the intensity of interest or resource conflict and therefore merit detailed analysis within the NEPA document and/or consideration for the development of an alternative to the proposed action.

The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…" No "significant" issues were identified through

internal or external scoping. Non-significant issues, and reasons regarding their categorization as non-significant, may be found in the Scoping Summary Report (Appendix A)

The resources listed below were used as the framework for the analysis. Analytical indicators are addressed in detail in Chapter 3 of this EA.

RECREATION/GUEST EXPERIENCE

Proposed projects at the Top of the Gondola, California Trail, Snow Beach and the Galaxy Pod would, by design, change the recreational experience at Heavenly.

Indicators:

- Analysis and disclosure of anticipated changes in existing and proposed skier/rider densities (i.e., skiers/riders per acre) within the Galaxy, Dipper and Comet pods
- Analysis and disclosure of existing and proposed lift-wait times (minutes) and skier/rider circulation
- Discussion of the role that intermediate terrain in the Galaxy, Dipper and Comet pods plays at Heavenly
- Discussion of the staging role that the Top of the Gondola area plays at Heavenly
- Discussion of the role that Snow Beach plays at Heavenly
- Discussion of on-mountain guest service opportunities at Heavenly

SCENERY RESOURCES

Is construction of the Gondola Lodge and relocation of the Umbrella Bar consistent with the Built Environment Image Guide? Are the proposed projects consistent with the Forest Plan?

Indicators:

- Disclosure of the incremental scenery effects of implementing the proposed projects compared to historic landscape alterations within the SUP area
- Discussion of/tie-back to visual simulations prepared for Master Plan Phase II and III projects in the 2007 EIS

CULTURAL RESOURCES

Proposed projects and associated ground disturbing activities could affect known or unidentified cultural resources.

Indicators:

- Description of known archaeological resources in the vicinity of proposed ground and vegetation disturbance
- Identification of project design features, best management practices, and/or mitigation measures designed to lessen or avoid impacts to known or unidentified cultural resources

WILDLIFE AND FISH

Proposed ground and vegetation disturbance would remove and/or affect wildlife habitat, which could affect individuals and populations of Threatened, Endangered, Sensitive (TES), and/or Management Indicator species.

Indicators:

- Disclosure of type and extent of existing wildlife habitat (acres) by species
- Disclosure of habitat alteration/removal (acres) by species
- Disclosure of effects by species and status

VEGETATION

Proposed ground and vegetation disturbance would remove and/or affect both over- and understory vegetation. This could affect individuals and populations of TES plant species, as well as increase the threat of invasive species.

Indicators:

- Disclosure of existing TES plant habitat by species (acres)
- Disclosure of habitat alteration/removal (acres) by species
- Disclosure of effects, by species and status
- Disclosure of existing invasive species (acres) and potential spread

WATERSHED AND SOILS

Proposed ground disturbance and snowmaking have potential to increase erosion and sedimentation.

Indicators:

- Area (acres) of temporary and permanent disturbance according to high/moderate/low erodibility soils classes
- Analysis of areas of existing and proposed permanent land coverage by sub-drainage per MPA 07 EIS
- Qualitative analysis of temporary erosion/sedimentation due to proposed ground disturbance
- Disclosure of the effectiveness of prescribed best management practices, mitigation measures, and monitoring that are designed to stabilize soils and eliminate temporary erosion risks

RESOURCES NOT ANALYZED IN DETAIL IN THIS EA

It was determined that the following resources would not require detailed analysis in the EA:[5]

Traffic and Parking

Per the 2007 EIR/EIS/EIS that analyzed Heavenly MPA 07, traffic volumes within the Lake Tahoe Basin, and especially on U.S. Highway 50, vary by season. Winter traffic volumes are typically lower than summer volumes. Generally, traffic is highest during mid-summer periods, especially around July 4th and during August. The average daily traffic (ADT) volumes during the peak month are 20 to 40 percent higher than the average volumes. Review of the peak month ADT volumes (Caltrans) indicates that these volumes have also remained relatively constant over the same time period.[6]

The 2007 EIR/EIS/EIS determined that the MPA 07 would not increase peak hour traffic beyond the levels estimated in the approved 1996 Final EIR/EIS/EIS.[7] In fact, the MPA 07 peak hour trip generation estimate is lower than the 1996 Final EIR/EIS/EIS trip generation estimate by 466 total trips (490 total trips vs. 956 total trips, respectively).

Heavenly is a founding partner in the Coordinated Transportation System (CTS) Memorandum of Understanding (MOU) and Participation Agreement and is a leading operator of the CTS (now known as BlueGo). The purpose of the CTS MOU was to create a public/private partnership to mitigate traffic and air quality impacts by improving transit operations in the Lake Tahoe Basin. Heavenly continues discourage the use of automobiles.

[5] The Scoping Summary Report (Appendix A), elaborates on resources and issues not analyzed in detail.
[6] 2007 EIR/EIS/EIS page 3.7-5
[7] Ibid. page 3.7-15

Finally, the 2007 EIR/EIS/EIS analysis estimated that no new trips (and no significant increase in vehicle miles traveled) would be generated by implementation of the MPA 07—primarily due to Heavenly's continued efforts to decrease automobile trips in the Lake Tahoe Basin via expanded shuttle service, contributions to the CTS, and parking strategies. Therefore, as stated in the 2007 EIR/EIS/EIS, it is not expected that MPA 07 projects would create any additional transportation related air quality impacts beyond those identified in the 1996 EIR/EIS/EIS.[8]

Air Quality

Air quality impacts were not deemed necessary for analysis, as they are typically associated with increased vehicular traffic. As discussed previously in "Traffic and Parking" the 2007 EIR/EIS/EIS determined that the MPA 07 would not increase peak hour traffic beyond the levels estimated in the approved 1996 Final EIR/EIS/EIS.

Project Design Features have been incorporated into Table 2-3 (Chapter 2) to reduce short-term, construction-related air quality impacts associated with implementation of any approved projects.

Social and Economic Resources and Environmental Justice

The proposed projects do not have potential to impact social and economic resources in South Lake Tahoe. Pertaining to Executive Order 12898 (Environmental Justice) no potential effects to minority or low-income individuals or communities were identified.

Noise

The Galaxy pod is a sufficient distance away from other Lake Tahoe developments that any noise associated with proposed snowmaking would not affect the human environment outside the Heavenly SUP area. Skiers in the Galaxy pod would be able to hear the noise associated with snowmaking which would be similar to noise from snowmaking on other trails at Heavenly. Potential noise impacts to wildlife are analyzed in the Wildlife section, Chapter 3D.

Wetlands

No wetlands were identified within or adjacent to the following project areas: the Gondola Lodge, *California Trail*, or the existing or relocated Umbrella Bar. Wetlands have been identified in the Galaxy pod, along a portion of the Daggett Creek Drainage. The new lift alignment would be designed to span the wetlands where the lift crosses the drainage, similar to the existing lift design. Trails construction and snowmaking line installation would avoid wetlands. All wetland impacts would be avoided through proper pre-construction flagging.

[8] Ibid. page 3.5-17

Climate Change

Greenhouse gas (GHG) emissions were considered in proportion to the nature and scope of the 2010 Capital Projects proposal—the potential to either affect emissions or be affected by climate change impacts. Individual components of the 2010 Capital Projects 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. Therefore, a detailed analysis of GHG emissions and climate change was not deemed necessary for this EA. However, the Recreation and Water Resources sections in Chapter 3 do include brief discussions of how climate change could affect these resources.

It is recognized that global climate change may affect human health, that there is uncertainty and unknown risk associated with global climate change, and that the ultimate effects on climate change are indeed the results of incremental cumulative effects of many actions, most of which are outside the Forest Service's control. However, it is not possible to discern significant climate change effects from this proposal, given the context of projects and plans and the lack of effects that can be meaningfully evaluated under current science, modeling, and policies.

OTHER LAWS, REGULATIONS OR POLICY

National Forest Management Act

This Act requires the development of long-range land and resource management plans. The 1988 Forest Plan was prepared as a requirement of this Act; it has been amended several times, including the Sierra Nevada Forest Plan Amendment, (2004). The 1988 Forest Plan provides guidance for all natural resource management activities on the Forest. The Act requires that all projects and activities be consistent with the 1988 Forest Plan.

The 1988 Forest Plan has been reviewed in consideration of Heavenly's 2010 Capital Projects, and this project was designed to be consistent with the 1988 Forest Plan. A Forest Plan consistency matrix and review for this project was completed (Project Record Document 1).

Endangered Species Act

In accordance with Section 7(c) of the Endangered Species Act, the United States Fish and Wildlife Service (USFWS) list of "endangered and threatened species that may be affected by Projects in the Lake Tahoe Basin Management Area" (updated on July 2009) was reviewed (Project Record Document 2).

National Historic Preservation Act

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effect of a project on any district, site, building, structure, or object that is included in, or eligible for inclusion in the National Register. Section 106 of the National Historic Preservation Act (P.L. 89.665, as

amended) also requires federal agencies to afford the State Historic Preservation Officer a reasonable opportunity to comment. Surveys were conducted for Native American religious or cultural sites, archaeological sites, and historic properties or areas that may be affected by this decision (Project Record Document 3). The cultural resources specialist report will be submitted to Nevada SHPO for review and concurrence.

Clean Water Act (Public Law 92-500)

All Federal agencies must comply with the provisions of the Clean Water Act. The Clean Water Act regulates forest management activities near federal waters and riparian areas. The project design features associated with the Proposed Action (identified in Table 2-3) ensure that the terms of the Clean Water Act are met, primarily pollution caused by erosion and sedimentation. Heavenly will obtain a National Pollution Discharge Elimination System (NPDES) permit from the Water Board before commencing any of the projects.

Environmental Justice (Executive Order 12898)

Executive Order 12898 requires that all federal actions consider potentially disproportionate effects on minority and low-income communities especially if adverse effects to environmental or human health conditions are identified. Adverse environmental or human health conditions created by any of the alternatives considered would not affect any minority or low income individual, group or neighborhood disproportionately.

Migratory Bird Treaty Act of 1918 as amended (16 USC 703-712)

The original 1918 statute implemented the 1916 Convention between the United States and Great Britain (for Canada) for the protection of migratory birds. Later amendments implemented treaties between the United States and Mexico, Japan, and the Soviet Union (now Russia). Specific provisions in the statute include the establishment of a Federal prohibition, unless permitted by regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention…for the protection of migratory birds…or any part, nest, or egg of any such bird." Because forestlands provide a substantial portion of breeding habitat, land management activities within the Lake Tahoe Basin Management Unit can have an impact on local populations. The Migratory Bird Act was considered in the Wildlife Analysis provided in Chapter 3D (Project Record Document 4).

Invasive Species, Executive Order 13112

This EA covers botanical resources and noxious weeds. The project's design features were designed to minimize risk of new weed introductions.

Floodplain Management, Executive Order 11988 of May 24, 1977 and Protection of Wetlands, Executive Order 11990 of May 24, 1977

These executive orders provide for protection and management of floodplains and wetlands. Compliance with these orders will be assured by incorporating the project riparian management objectives and adhering to the project design features, including the implementation of Best Management Practices, outlined in Table 2-3.

Special Area Designations

There are no specially-designated areas that would be affected by these projects (i.e., Research Natural Areas, Inventoried Roadless Areas, Wilderness Areas, Wild and Scenic Rivers, etc.).

Chapter 2

Alternatives, Including the Proposed Action

2. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter describes the No Action Alternative and the Proposed Action. It includes detailed descriptions of alternative, an overview of Project Design Features and Best Management Practices, and a summary comparison of the alternatives. Chapter 2 is intended to present the alternatives in comparative form, defining the issues and providing a clear basis for choice among options by the responsible official and the public.[9]

A. ALTERNATIVES CONSIDERED IN DETAIL[10]

The range of alternatives the Forest Service ID Team considered for this analysis was bound by the Purpose and Need underlying the Proposed Action, as well as by the issues that arose from internal and external scoping (detailed in Chapter 1). NEPA requires that an environmental analysis examine a range of alternatives, which are "reasonably related to the purpose of the project."[11] Furthermore, Forest Service Handbook 1909.15 directs the ID Team to "consider a full range of reasonable alternatives to the Proposed Action that address the significant issues and meet the Purpose and Need for the Proposed Action."[12]

ALTERNATIVE 1 – NO ACTION

The No Action Alternative provides a baseline for comparing the effects of the action alternatives. The No Action Alternative reflects a continuation of existing management practices without changes, additions, or upgrades. As such, no new trails, infrastructure, facilities, or snowmaking lines would be implemented as a result of the No Alternative. Consistent with Forest Service policy, the effect(s) of taking no action closely correlates with the Purpose and Need (defined in Chapter 1).[13]

Guest Services at the Top of the Gondola

Heavenly's MPA 07 identifies the top of the Gondola as the predominant destination access point—roughly 40 percent of skiers and riders, and all of summer guests, access the mountain from the Gondola. The top of the Gondola is a focal point for summer and winter activities, hosting Adventure Peak and teaching terrain, restrooms, as well as the Tamarack Express and Big Easy lift.

Given the importance of this area for Heavenly's operations, guest service facilities at the top of the Gondola are inadequate, and limited to the Umbrella Bar, which does not provide indoor seating or guest

[9] 40 CFR 1502.14
[10] Refer to Table 2-1 for a summary of the differences between the two alternatives.
[11] 40 CFR 1502.14(a)
[12] USDA Forest Service, 1992
[13] FSH 1909.15, 41.22

services. The Umbrella Bar has a guest capacity of roughly 100 people. Therefore, during periods of cold temperatures and inclement weather, few resort visitors have an opportunity to get inside to eat, relax, or escape the elements.

Due to the guest services situation at the top of the Gondola, beginner level guests must download the Gondola for access to indoor facilities in Heavenly Village. More experienced skiers and riders can disperse across the mountain to locations with indoor guest service facilities. However, because of the limited number of on-mountain, indoor seats (approximately 1,060) across Heavenly, these facilities often experience crowding.

Guest Services at Snow Beach

Snow Beach is a snack bar located at the base of *Patsy's* and *Maggie's* trails and serves visitors using *Patsy's* trail as well as those returning from upper portions of the California side of the resort with restrooms and food service. The existing facility is approximately 790 square feet with 80 outdoor seats and no indoor or covered seats.

California Trail

California Trail is an important component of the intermediate skiing and riding experience at Heavenly. This high-capacity, intermediate trail is easily accessible from the top of the Gondola area and is served by a single lift—the Tamarack Express.

Currently, the height of natural features such as boulders and downed trees on *California Trail* require up to 5 feet of snow coverage before this terrain can be opened. Therefore, in the early season and during low-snow years, Heavenly focuses a great deal of energy and water resources on making snow on *California Trail*.

Galaxy Pod

The Galaxy pod consists of one fixed-grip double chairlift (Galaxy) and two trails—*Perimeter* (U1) and *Galaxy* (U2)—on the Nevada side of the resort. The MPA 07 indicates that the capacity of the Galaxy pod is 613 guests. Due to the limited amount of terrain (27.6 acres) and long lift ride (12.5 minutes), the Galaxy pod is underutilized, while pods with similar Intermediate terrain—such as Stagecoach, Comet and Dipper Express (both high-speed, detachable quads)—experience crowding. Wait times can approach 25 minutes at the Dipper Express and 12 minutes on the Stagecoach Express during busy periods.

Currently there is no snowmaking in the Galaxy pod; therefore opening these two trails is often delayed as compared to other Intermediate terrain across the SUP area where snow can be made to provide adequate cover.

ALTERNATIVE 2 – THE PROPOSED ACTION

The reader is encouraged to reference figures 1 through 4 in conjunction with the following project descriptions.

Gondola Lodge

The Proposed Action includes constructing a new day lodge approximately 400 feet north of the top terminal of the Gondola.

The proposed Gondola Lodge is designed to improve guest services in a critical location for Heavenly's winter and summer operations.

This was referred to as "Von Schmidt's Lodge" in the MPA 07, and was conceptually located slightly northeast of the currently proposed location. Since the MPA 07 was accepted, Heavenly has completed a detailed site analysis throughout the vicinity of the top of the Gondola to identify the ideal location for the lodge. As analyzed within this EA, the proposed Gondola Lodge site was chosen based on its ability to:

- be located at the center of all activities at the top of the Gondola area including the Tamarack lift, Big Easy lift, Tubing lift, Heavenly Flyer, Ski School and Adventure Peak;
- accommodate existing skier/rider (winter) and pedestrian (summer) circulation patterns;
- operate and maintain the facility throughout the year (e.g., accommodate snow grooming throughout the top of the Gondola area, allow food and beverage deliveries out of the public views);
- maximize views from the dining area toward the south;
- take advantage of passive solar radiation with a south facing orientation;
- facilitate interaction with nearby ski school and tubing activities;
- make use of existing underground utilities; and
- minimize tree removal (compared to the "Von Schmidt's Lodge" [MPA 07] location).

The lodge would be a single-story building providing self-service dining, a small bar, open seating and restrooms. The footprint of the proposed building is 14,750 square feet. Indoor seating capacity would be approximately 488 seats. A 4,320-square foot concrete patio, located on the south side of the lodge facing Adventure Point, would accommodate tables and chairs for outside dining as weather permits.

The proposed Gondola Lodge would be set back into a hill, on the perimeter of Von Schmidt's Flats, to optimize skier/rider circulation. During construction, the building site would be leveled. The western end of the site would be excavated so that it is the same elevation as the east end of the site. The resulting retained slope behind the western side of the lodge would be a maximum of approximately 33 feet high

and 75 feet long with a 1.5:1 slope. Spoils from the excavation would be used to level the area in front of the Tamarack Express chairlift to reduce the amount of snowmaking needed in the winter, and to level out the old snow tubing area.

Because an existing summer maintenance road crosses the proposed lodge site, an approximate 300-foot segment of it would be relocated to the east near the existing handle tow lift (Red Fir lift). The Proposed Action includes constructing a new delivery road, approximately 300 feet long, from the existing maintenance road to the rear of the lodge for service and delivery purposes. Other than the delivery spur, no new roads would be needed for lodge construction or operations.

The proposed Gondola Lodge would be open in the summer to support the Adventure Peak activities. The existing barbecue at Adventure Peak adjacent to the top of the gondola would remain, however, the kitchen building and Umbrella Bar would be removed and the Umbrella Bar would be relocated, as described below.

The design of the proposed Gondola Lodge would be consistent with applicable provisions of the Forest Service's Built Environment Image Guide (BEIG).[14] The lodge design and operation would be LEED certified for environmental efficiency and sustainability. It would be a single-story building with a simple shed roof (3:12 pitch) that slopes from front to back in order to take advantage of existing views. The maximum height of the building would be 39 feet. This structure would be similar in design to the existing Gondola mid-station restrooms, Café Blue, and Gondola Sports.

Existing utilities and infrastructure in the area would be used to connect the lodge to electricity, natural gas, fiber-optic and communication lines. Each utility extension would be approximately 150 feet long and would be installed within the maintenance road. Existing electrical switch gear that is near the proposed lodge site would be relocated to the north and be combined with other existing electrical switch gear.

Snow Beach

As discussed previously, the Umbrella Bar that is currently located at the top of the Gondola would become obsolete once the Gondola Lodge is constructed. Consistent with the MPA 07, which envisioned a seasonal, open-air shelter at Snow Beach to accommodate additional seating, as well as additional food service and barbeque capabilities, the Umbrella bar is proposed to be permanently relocated to this area once the Gondola Lodge is constructed. While the Umbrella bar would not accommodate additional food service or barbeque capabilities, these services are planned for the future.

[14] FS-710

Magic Carpet Conveyor Lift

In conjunction with construction of the proposed Gondola Lodge, the existing children's Magic Carpet ski school lift would be relocated to the Discovery Forest area near the Big Easy trail (see Figure 2). This would enable Heavenly to maintain beginner-level ski school opportunities for children and to provide adequate distance separation between the lift and the proposed Gondola Lodge.

California Trail

As discussed in the Purpose and Need (Chapter 1), due to the topography, soils and geology throughout the Heavenly SUP area, large boulders and downed trees within developed trails present unique challenges when it comes to opening and maintaining adequately covered terrain for skiing and riding each season. Therefore, Heavenly developed the *Easy Street Run Hazard Reduction* (ESRHR) Prescription, which was originally implemented on the *Easy Street* Trail. The ESRHR Prescription enables Heavenly to accomplish its operational objectives of providing adequate snowmaking coverage on key trails, while minimizing potential soil disturbance and resultant revegetation requirements and still allowing for a decrease in height of overall effective snow cover for conservation of energy and water resources (water and power needed for snowmaking). The prescription also minimizes disturbance to small-scale or micro-habitat for wildlife. Section 3.2 of the Heavenly's MPA 07 introduces the ESRHR Prescription; the full ESRHR Prescription is contained in Appendix 3 of the MPA 07. The ESRHR Prescription includes the following objectives:

- Reduce height of existing effective surface cover (felled trees, large woody debris, stumps, and boulders) to between 12 to18 inches
- Reduce consumption of electrical energy and water resources
- Attain and maintain the 70 percent total effective surface cover as required by the Cumulative Watershed Effects (CWE) Analysis
- Protect and maintain existing native woody shrub and groundcover populations
- Provide a variety of surface cover for wildlife microhabitat

The ESRHR Prescription is proposed to be implemented on an approximately 4.2-acre section of upper *California Trail* and a small spur between it and the adjacent *Tamarack Return* trail (see Figure 2). The extent of the proposed ESRHR Prescription on *California Trail* was determined as based on identified Tahoe draba (Draba asterophora v. asterophora, sensitive plant species) populations within the trail, which need to be avoided. Tahoe draba are present on *California Trail* above elevation 9,400 feet. Because blasting and construction activities associated with the ESRHR Prescription have the potential to impact the existing draba population, a 50-meter (165-foot) buffer between the elevation of the known draba population and the elevation of implementation of the ESRHR Prescription on *California Trail* has been included in the Proposed Action.

Galaxy Lift and Trail Improvements

Galaxy Replacement Lift

Heavenly proposes to replace the existing fixed-grip double Galaxy lift with a higher capacity detachable quad (the Galaxy Express), as discussed in the MPA 07. The proposed lift alignment and terminal locations are identical to the existing lift. However, the proposed high-speed quad would have a greater capacity and chair width than the fixed-grip double, necessitating a wider lift corridor. The existing lift corridor would be widened slightly to comply with National Tram Board requirements—from roughly 30 feet to 33 feet wide.[15] With the upgraded lift, the capacity of this lift has been calculated to increase from approximately 613 persons to 1,370 skiers-at-one-time.[16] The higher capacity of this detachable lift would be accompanied by terrain additions in the Galaxy pod (discussed below).

Trees would be cut over-the-snow and placed in a location that is accessible by truck for removal during the dry season. Minor road surface improvements, including runoff control improvements and obstacle removal, would occur along segments of the existing summer maintenance road to the base terminal as part of the project.

Proposed New Trails with Snowmaking in the Galaxy Pod

Heavenly proposes to increase the skiable terrain in the Galaxy pod by constructing four new trails, which would supplement the existing *Galaxy* and *Perimeter* trails. Trails proposed for the Galaxy pod would naturally accommodate skiers and snowboarders that learned in the teaching area at the top of the Gondola and that are ready to progress to Intermediate terrain. All of the trails in the Galaxy pod are proposed to be Intermediate, allowing for separation between different ability levels.

Conceptual alignments of all four new trails are described in Chapter 3 of the MPA 07. The following lengths and areas are slightly different from the MPA and reflect contemporary trail planning and in some cases known cultural resources:

- Proposed Trail U3 would be roughly 2,360 feet in length and approximately 5.4 acres in area.
- Proposed Trail U4 would be roughly 1,500 feet in length and approximately 4.2 acres are area.

Proposed Trails 14 and 15 are intended to serve as important access trails between the Stagecoach and Galaxy pods.

- Proposed Trail 14 is roughly 3,500 feet in length and approximately 8.7 acres in area.
- Proposed Trail 15 is roughly 2,060 feet in length and approximately 5.3 acres in area.

[15] ANSI B77.1
[16] MPA 07 pg. 3-28

Below ground snowmaking infrastructure is proposed for all new trails in the Galaxy Pod—U3, U4, 14 and 15—totaling approximately 23.6 acres of snowmaking capability. Approximately 9,500 linear feet of underground snowmaking line would be installed on these four new trails. Snowmaking lines would be buried to a sufficient depth below the frost line. Heavenly uses a 30-foot wide disturbance corridor for installation of snowmaking lines to accommodate the trench, excavation equipment, piping material, and a temporary spoils pile necessary for snowmaking line installation. This equates to approximately 6.5 acres of temporary ground disturbance, as disturbed areas will be promptly stabilized and revegetated.

In addition to Project Design Features and Best Management Practices stipulated in Table 2-3, below, proposed trails in the Galaxy pod would be constructed according to Heavenly's Revised Construction Erosion Reduction Program (CERP), and as outlined in the ESRHR Prescription. Heavenly has successfully implemented the ESRHR prescription in conjunction with snowmaking line installation in the past, and has found that the excavator used to dig the trench helped facilitate the treatment of the logs, stumps and rock "topping" that is a part of the prescription.

Heavenly's Revised CERP includes the following:

General

- Ski trail boundaries shall be delineated with a rope boundary fence to ensure areas outside the proposed ski trail are not disturbed by construction.
- Trees that are 20 inches or less in diameter will be chipped.
- All logs that remain on site will be trimmed of branches so that all branches that are lower in height than the diameter of the log remain in order to provide micro-scale habitat for rodents and small mammals.
- Logs that remain onsite will be aligned across the slope of the ground surface.
- Boulders shall be capped to a height of 12 to 18 inches.
- All construction activities shall comply with the Best Management Practices for General Construction and Ski Trail Construction designated in the Revised Construction Erosion Reduction Program.

Tree Felling

- The Forest Service shall mark all trees on the bole and stump with paint.
- All trees will be hand-felled with a chainsaw, and directional felling will be utilized to avoid damage to unmarked trees, Stream Enforcement Zone (SEZ)/stream channels, and cultural resources.

- Stumps shall be kept to a height of 6 inches or less on the uphill side, except where safety or embedded metal makes this impracticable.
- Borax tree stumps in the summer following flush cutting.

Skidding/Yarding

- All tree removal shall take place during sufficient snow cover (24-inch minimum) so as not to disturb soils and/or vegetation.
- Trees with significant rot and other cull requirements shall not be stacked in decks or piles that will concentrate potential fuels.
- Sound trees to be removed from the forest will be removed over snow to the East Peak Borrow Area, or other designated staging areas.

Slash Disposal

- Tree tops and limbs shall be lopped and scattered by hand across the slope to help with erosion control. The slash shall be lopped down to a height of 18 inches or less above the ground to reduce obstacles for skiers.
- The amount of woody material scattered in areas with vigorous populations of pine mat manzanita or other existing ground cover should be kept to a minimum in order to avoid damage or dieback of these populations.

Stream Zones

- Trees identified for removal within SEZs shall be directionally felled away from the SEZ centerline. Trees near SEZs will also be directionally felled away from the SEZ.
- Felled trees and harvest slash shall be kept out of all perennial and intermittent streams.

Proposed Snowmaking on Existing Trails in the Galaxy Pod

Heavenly proposes to install snowmaking infrastructure on the existing *Perimeter* and *Galaxy* trails, which are currently 100 percent reliant on natural snow for coverage. Approximately 10,800 feet of snowmaking line is proposed for these two trails, which would provide approximately 24.6 acres of new snowmaking coverage. This would entail roughly 7.4 acres of temporary ground disturbance necessary for installation of snowmaking lines.

Installation of snowmaking infrastructure would be implemented consistent with applicable provisions of the CERP.

B. COMPARISON OF ALTERNATIVES

Table 2-1 compares the components of each alternative, while Table 2-2 summarizes the environmental consequences of each alternative, by resource. Depending on the resource, impacts are measured either quantitatively or qualitatively.

Table 2-1:
Summary of Project Components By Alternative

	Alternative 1 No Action	Alternative 2 Proposed Action
SUP BOUNDARY (ACRES)	7,020	7,020
SAOT (NEVADA/IN-BASIN)	No Change	757 additional
GUEST SERVICES		
On-Mountain Guest Service Facilities	6	7
On-Mountain Indoor Seating	1,060	1,583
Top of the Gondola Indoor Seating	25 (Umbrella Bar)	488 (Lodge)
Snow Beach Indoor Seating	0	60 (Umbrella Bar)*
LIFT NETWORK	29 lifts	29 lifts
INTERMEDIATE TERRAIN (SUP)	351.3	374.9
NEVADA/CALIFORNIA	202.9/148.4	226.5/172
GALAXY POD	27.6 acres	51.2 acres
TOTAL SNOWMAKING COVERAGE	~310 acres	~358
GROUND & VEGETATION DISTURBANCE (ACRES)		
Top of the Gondola		
Vegetation removal (Magic Carpet only)	--	0.06
Grading	--	2.03
Galaxy Pod		
Vegetation removal (trails only)	--	23.6 acres
Vegetation removal (lift corridor only)	--	0.38 acre
Grading/Trenching (snowmaking lines only)	--	15.3 acres
ESRHR Prescription	--	17.2 acres
Snow Beach		
Grading	--	0.02 acre
California Trail		
ESRHR Prescription	--	4.2 acres

* The Umbrella bar currently offers 25 seats at the bar. Once it is relocated to Snow Beach, to better accommodate the need for indoor family seating, additional seating would be provided along the ledge next to the windows.

Table 2-2 summarizes the effects of implementing each alternative.

Table 2-2:
Summary of Environmental Consequences By Alternative

Resource	Alternative 1 No Action	Alternative 2 Proposed Action
RECREATION ***Proposed projects at the Top of the Gondola, California Trail, Snow Beach and the Galaxy Pod would, by design, change the recreational experience at Heavenly.***	The No Action Alternative would have no additional direct, indirect, or cumulative impacts to recreational offerings or experiences throughout the Heavenly SUP.	**Snowmaking –** Approximately 48 acres of new snowmaking would occur within the Galaxy Pod, providing consistent snow coverage. Additionally, implementation of the ESRHR Prescription on a section of *California Trail* would be both a benefit to Heavenly's snowmaking operations and improve recreation. **Galaxy Pod Utilization –** Replacement of Galaxy lift with a detachable quad and the construction of four new associated trails would alter circulation and usage patterns on the Nevada side of Heavenly. As a result, utilization of the Galaxy pod is predicted to increase and utilization of the Comet and Dipper lifts is predicted to decrease, thereby balancing use of these three important Intermediate lifts. Utilization rates for all three lifts would be slightly over the lifts' hourly uphill capacities, meaning there would likely be short lift lines at all three lifts on days of high visitation. Skier densities on Galaxy terrain are predicted to increase by 30% but would remain well within industry average targets for specified terrain ability levels. **Top of Gondola –** With 488 indoor seats, the Gondola Lodge would benefit the entire range of guests that visit Heavenly through the year, including skiers and riders, people recreating at Adventure Point, ski school patrons, and summer/winter sightseers. **Snow Beach –** Relocating the Umbrella Bar to Snow Beach would provide a cost-effective and logical way of meeting Heavenly's need to provide additional seating and food service in the Snow Beach area.

Table 2-2:
Summary of Environmental Consequences By Alternative

Resource	Alternative 1 No Action	Alternative 2 Proposed Action
SCENERY ***Construction of new trails in the Galaxy Pod and the Top of the Gondola Lodge, as well as relocation of the Umbrella Bar to Snow Beach, need to be analyzed in the context of Forest Plan and Built Environment Image Guide Consistency.***	The No Action Alternative would have no additional direct, indirect, or cumulative impacts to scenic environment throughout the Heavenly SUP area.	For all proposed projects, short-term impacts to the aesthetic environment would result from ground disturbing activities. These short-term impacts would be minimized through prompt revegetation of disturbed areas. Visual resources within the project areas would continue to comply with the VQO of Partial Retention for the Heavenly SUP (part of the Heavenly Valley Management Area). The Gondola Lodge would not be consistent with the BEIG. The lodge architecture would use forms, materials and colors to match existing on-mountain buildings. Should the Umbrella Bar (an octagonal-shaped, green and brown structure with windows on all sides) be placed adjacent to the existing rectangular, blue Snow Beach building, it would be difficult to make the two facilities aesthetically congruent.
CULTURAL ***Proposed projects and associated ground disturbing activities could affect known or unidentified cultural resources.***	The No Action Alternative would have no additional direct, indirect, or cumulative impacts to historic sites within the APE as a result of the No Action Alternative.	No cultural resources were identified within the proposed lodge and *California Trail* Area of Potential Effect (APE), nor the relocated Umbrella Bar and Snow Beach APE. Ski trail construction and snowmaking activities in the Galaxy Pod APE would avoid any potential project impacts to cultural resources through modified trail alignments, project design features, and monitoring. The determination for projects included in the Proposed Action is No Historic Properties Affected.

Table 2-2:
Summary of Environmental Consequences By Alternative

Resource	Alternative 1 No Action	Alternative 2 Proposed Action
WILDLIFE & FISH ***Proposed ground and vegetation disturbance would remove and/or affect wildlife habitat, which could affect individuals and populations of Threatened, Endangered, Sensitive (TES), and/or Management Indicator species.***	The No Action Alternative would impose no direct, indirect, or cumulative impacts or benefits to federally listed, Forest Service, or TRPA special status species or habitat.	The Proposed Alternative would result in approximately 39.2 acres of disturbance to California Wildlife Habitat Relationship System habitat types. No Threatened or Endangered wildlife species are present, or have suitable habitat that would be impacted, within the project areas. *LTBMU Sensitive Wildlife Species* **Bald Eagle –** Bald eagles have not been sighted within the Heavenly SUP since 2007. No impacts to water bodies or suitable nesting or roosting trees for Bald eagles would occur. Alternative 2 would not impact Bald eagles. **California Spotted Owl** – habitat removal would accompany construction of proposed trails U3 (5.4 acres) and U4 (4.2 acres) totaling 9.6 acres of habitat loss. As no spotted owls have been detected, no direct, indirect or cumulative impacts to this species would result from implementation of the Proposed Action. **Northern goshawks** – habitat removal would accompany construction of proposed trails U3 (5.4 acres) and U4 (4.2 acres) totaling 9.6 acres of habitat loss. As no northern goshawks have been detected, no direct, indirect or cumulative impacts to this species would result from implementation of the Proposed Action. **American Marten** – proposed trails U3, U4, 14 and 15 would result in the modification of approximately 23.7 acres of marten habitat; however, due to the overwhelming amount of terrain available for foraging at Heavenly that is not currently groomed, impacts would be negligible.

Table 2-2:
Summary of Environmental Consequences By Alternative

Resource	Alternative 1 No Action	Alternative 2 Proposed Action
		LTBMU Management Indicator Species **Mountain Quail –** A total of 17.21 acres of mountain quail habitat will be lost through the implementation of Ski Trails U3, U4, 15 and 16. Habitat trends for mid seral coniferous forest has increased in the last decade, therefore the decrease will have no effect on this species. **Hairy Woodpecker –** A total of 17.21 acres of hairy woodpecker habitat will be lost through the implementation of Ski Trails U3, U4, 15 and 16, which would include loss of 202 existing snags within the ski trails. Habitat trends for medium sized and large snags per acre has increased for red fir forest as well as mixed conifer forest on NFS Lands, therefore there would be no effect to this species from Alternative 2. *TRPA Sensitive Species* **Osprey** – no direct or indirect effects to osprey would occur as a result of Alternative 2 implementation.

Table 2-2:
Summary of Environmental Consequences By Alternative

Resource	Alternative 1 No Action	Alternative 2 Proposed Action
VEGETATION ***Proposed ground and vegetation disturbance would remove and/or affect both over- and understory vegetation. This could affect individuals and populations of TES plant species, as well as increase the threat of invasive species.***	The No Action Alternative would have no additional direct, indirect, or cumulative impacts or benefits to listed, candidate or sensitive plant and fungi species.	**Galena Creek Rock Cress** – Modify 41.5 acres of suitable habitat, No effect. **Botrychium Species and Veined Water Lichen** – Tree felling guidelines to prevent damage to stream bank habitat and pre-construction surveys would prevent direct impacts to these species. Approximately 188 feet of Trail U3 intersects Daggett Creek and 174 feet of Trail 15 intersects Daggett Creek. Project Design Features (PDFs) would be required to avoid indirect impacts from tree removal near Daggett Creek and snow compaction at creek crossings. **Bolander's Candle Moss** – Modify suitable habitat along approximately 362 feet of Daggett Creek in trails U3 and 14, No effect. **Tahoe Draba** – Modify 4.2 acres of suitable habitat on *California Trail*, No effect. **Subalpine Fireweed** – Modify suitable habitatalong approximately 362 feet of Daggett Creek in trails U3 and 14, No effect. **Starved Daisy** – Modify 35.3 acres of suitable habitat in trails U3, U4, 14, 15, *Perimeter* and *Galaxy* and the *California Trail*, No effect. **Torrey's or Donner Pass Buckwheat** – Modify 6.3 acres of suitable habitat on *California Trail* and the Gondola Lodge, No effect. **Short-leaved Hulsea** – Modify 35.3 acres of suitable habitat in trails U3, U4, 14, 15, *Perimeter* and *Galaxy* and the *California Trail*, No effect. **Late Seral forests** – No effect. **Noxious weeds** – The spread of noxious weeds would

Table 2-2:
Summary of Environmental Consequences By Alternative

Resource	Alternative 1 No Action	Alternative 2 Proposed Action
		be avoided by adherence to PDFs.
WATERSHED & SOILS ***Proposed ground disturbance and snowmaking have potential to increase erosion and sedimentation.***	The No Action Alternative would have no additional direct, indirect, or cumulative impacts or benefits to soil or watershed resources.	**Soils** – Both permanent and temporary impacts to soils within the project area; however, accounting for the implementation of BMPs and PDFs per Table 2-3, as well as Heavenly's CERP, these impacts are expected to be negligible. The Gondola Lodge and relocated road would convert 0.6 acre of native soils to impervious or compacted surfaces. Approximately 38.6 acres (98%) of the proposed development would be a temporary impact associated with trail construction and snowmaking installation. **Soil Erosion** – 16.7 acres of ground disturbance that could result in measurable erosion (Galaxy pod snowmaking, Gondola Lodge, realigned road). Implementation of BMPs and PDFs would enhance site recovery. As a result, the Proposed Action is not expected to impact long-term rates of soil erosion in the project area. **Land Coverage** –The relocated Magic Carpet and Umbrella Bar, the Gondola lodge and *California Trail* ESRHR Prescription would be located in-Basin and therefore subject to TRPA review for land coverage analysis. Only the Gondola Lodge would require new land coverage. All In-Basin improvements will utilize legally banked land coverage that was field verified in 2005 by TRPA.

C. PROJECT DESIGN FEATURES & BEST MANAGEMENT PRACTICES

Activities associated with implementation of action alternatives could have localized, short-term effects. The following design features have been incorporated into the Proposed Action and are intended to minimize or avoid effects to soils, water, vegetation, wildlife, fisheries, heritage resources, recreational resources, and air quality.

Responsibility for ensuring that these design features are implemented rests with Heavenly. In all cases, the ultimate enforcement mechanism for implementation of the specified design features would be the Decision Notice, and would extend to the Forest Service SUP Administrator and the Forest Supervisor.

Table 2-3:
Project Design Features and Best Management Practices

CULTURAL RESOURCES
Any previously unidentified archaeological remains fortuitously discovered or exposed during project implementation will be afforded full protection until qualified personnel are able to assess the situation. All project related work will stop immediately and LTBMU heritage resources personnel will be notified at once.
Planned project activities fall in close proximity to several archaeological sites and direct impacts due to construction are a possibility. Avoid all known historic properties from trail construction and associated snowmaking activities. Proposed trails will be cleared by over-the-snow logging to allow a protective mantle of snow covering the archaeological sites. Although stumps will be flush-cut when the ground is clear of snow and the archaeological sites are exposed, all work in proximity to sites will be carried out by hand and vehicles will be prohibited from entering the area. Slash and wood debris will be chipped away from the sites and into the newly-cleared trails. New snowmaking pipelines will be buried below frost line along the edges of all runs within the Galaxy pod area of potential effects. To avoid direct impacts to segments of the historic wood haul road, snowmaking lines will be laid in a horizontal boring beneath the historic grades to eliminate any disturbance to the surface grade.
The protection areas will be clearly marked as generic "sensitive zones" on all project maps, which will be approved by the LTBMU Heritage Resource Program Manager. Heritage resource locations will remain confidential.
During the ski season, a barrier will be placed around historic sites with high-profile features. Bright-colored plastic fencing and/or rope and bamboo stakes will be temporarily installed in order to restrict access by skiers and riders who might use the features as jumps and the barriers will be adjusted as conditions change throughout the season.
Once the previously identified Project Design Features are in place, additional protection measures will be implemented during and after project construction/implementation in order to monitor continued preservation of heritage resources inventoried within the APE. 1) When construction work is on-going within 100 feet of a historic property, an archaeological monitor will be on site to ensure protection measures are implemented and effective. Monitoring will take place: - prior to logging in order to re-check trees marked for removal in relation to flagged site locations - during over-the-snow logging to insure directional falling away from sites - during chipping activities to confirm that chips are directed into new trails and away from any site, and that equipment and other rubber tire vehicles are prohibited from entering site areas - during hand work involving stump removal 2) Post-construction monitoring of all properties identified on the construction plans as protection areas will be monitored a second time after the completion of the construction activity. A monitoring form will be completed to document these efforts. Post-construction monitoring will take place: - during the first ski season to insure that protective fencing installed around high-profile features is correctly in place - following the first ski season to assess each site's conditions
SCENIC RESOURCES
Follow FSM guidelines (Section 2380) and the Built Environment Image Guide (BEIG) regarding the final design of the Gondola Lodge.
Trail edges should be non-linear, and changes in tree heights along the edges of openings should be gradual rather than abrupt. Soften hard edges by selective removal of trees of different ages and heights to produce irregular corridor edges where possible.

Table 2-3:
Project Design Features and Best Management Practices

Any site grading should blend disturbance into the existing topography to achieve a natural appearance and minimize cuts and fills at the transition with proposed grading and existing terrain.
Facilities or structures including buildings, lift terminals and chairs need to minimize reflectivity. This includes any reflective surfaces (metal, glass, plastics, or other materials with smooth surfaces), that do not blend with the natural environment. They should be covered, painted, stained, chemically treated, etched, sandblasted, corrugated, or otherwise treated to meet the solar reflectivity standards. Facilities and structures with exteriors consisting of galvanized metal or other reflective surfaces will be treated or painted dark non-reflective colors that blend with the forest background to meet an average neutral value of 4.5 or less as measured on the Munsell neutral scale.
Facilities or structures including buildings, lift terminals and chairs, culverts need to meet color guidelines. Bright colors are inappropriate for the forest setting. The colors should be muted, subdued colors because they blend well with the natural color scheme. The Forest Service Handbook No. 617, "National Forest Landscape Management for Ski Areas, Volume 2, Chapter 7," refers recommended colors for ski areas on page 37 of that handbook. The colors are darker colors; greens, browns, navy blue, grays and black.
WILDLIFE
Implement Mitigation Measure (HMPA FEIS 2007) BIO-2 Active Raptor and Migratory Bird Nest Site Protection Program
Implement Mitigation Measure (HMPA FEIS 2007) 7.4-14 Monitor and Protect Northern Goshawk
New facilities that include refuse containers shall be designed to be wildlife proof to prevent access by wildlife species. A trash management program shall be generated for the new facilities which will prevent trash to remain in locations where it is accessible to resident wildlife species.
Annual California spotted owl and northern goshawk surveys will continue to be performed throughout the Heavenly SUP area prior to construction and in accordance with the accepted protocol and the Sierra Nevada Forest Plan Amendment Record of Decision (SNFPA ROD, January 2004).. If either species are detected within the project area and determined to be nesting, a Protected Activity Center (PAC) will be delineated in accordance with the SNFPA ROD. If any of the proposed 2010 Capital Project are located inside or within 0.25 mile of the PAC, a Limited Operating Period would be implemented which would limit construction activities and vegetation treatments during the breeding season (March 1 through August 31 for California spotted owl) and (February 15 through September 15 for northern goshawk).
VEGETATION RESOURCES
Prior to construction, the disturbance limits of the project site will be flagged. Pop fencing, flagging, or a staked rope line will be established to denote the limits of construction proximate to sensitive resource boundaries.
Tree removal related to installation of the Galaxy Express, as well as trail construction, will be conducted over-the-snow. Stumps will be flush-cut or ground once snow has melted. Trees shall be felled away from the Daggett Creek stream channel so as to minimize disturbance.
State plant survey data remains active for 5 years from the survey data at which time additional surveys would need to be completed prior to any construction activities. Identified individuals or populations shall be flagged and mapped. Forest Service botanists shall be consulted to determine adequate protection measures. Proposed and Sensitive plant species identified in Table 3E-1 shall be avoided.

Table 2-3:
Project Design Features and Best Management Practices

Minimize loss of Tahoe draba plants by installing protective fencing around occupied habitat that is adjacent to approved construction projects. Fencing shall be installed prior to the onset of construction, shall be at least 4 feet in height, and shall be installed along the boundary of any construction zone, staging areas, or roads and trails that will be used for construction access and are located adjacent to existing Tahoe draba plants. Fencing will be maintained throughout the duration of construction activities and removed upon completion of the project and prior to the opening of the ski season. Installation of information signs and/or educational meetings would be used inform construction crews of the purpose of the fencing.
All disturbed areas shall be revegetated after the site has been satisfactorily prepared. Seeding should be repeated until satisfactory revegetation is accomplished. Revegetation will be accomplished with Forest Service approved plants and seed mixtures.
The lowest elevational extent of Tahoe draba habitat on *California Trail* will be flagged prior to implementation of the Easy Street Run Hazard Reduction Prescription. A Forest Service Botanist/Ecologist will either 1) flag the population's extent or 2) will approve flagged extent. All construction activities shall be at least 50 meters away from the identified extent of Tahoe draba, which is approximately 9,400 feet in elevation. This will represent the limit for which this prescription can be implemented.
The Easy Street Run Hazard Reduction Prescription implemented on *California Trail* shall not utilize chipping of woody debris, shrubs or other vegetative material.
Construction activities will avoid capping rocks/boulders that have Tahoe draba growing near them. If rocks must be capped near Tahoe draba populations, existing plants shall be covered during blasting with canisters or other approved protective measures. This measure is in addition to previously described fencing.
Fences and blasting operations near Tahoe draba plants shall be monitored for the duration of the construction season by contractors, Heavenly staff, and Forest botanists to ensure compliance.
All gravel, fill, mulches or other materials should be weed free. Use onsite sand, gravel, rock or organic matter where possible. Otherwise, obtain materials from gravel pits and fill sources that have been determined to be weed-free by the Forest Service Botanist or Ecologist.
Except as otherwise noted within descriptions of individual project components requiring tree removal, all new ski trails will be constructed by "flush cutting" removed trees. With this method, stumps will be cut to a height of approximately 6 inches or less from the ground surface; the process may also include stump grinding. This trail preparation method avoids the need to disturb the remaining stumps and/or surrounding soils, thereby minimizing overall ground disturbance and existing vegetation.
Upon completion of ground disturbing activities a minimum of 2 inches of mulch would be applied to disturbed areas (2007 EIR/EIS/EIS Appendix 2-B, pg. 24).
Understory vegetation will be preserved to the extent possible by removing downed logs and minimizing construction traffic in all areas designated for flush cutting and/or overstory vegetation removal.
Prior to removal of merchantable timber, decking areas and removal routes will be designated in the field and approved by the Forest Service.
Topsoil replacement, seeding, and weed-free mulching (as necessary) will be used to stabilize disturbed soils in all areas where grading and soil disturbance will occur to promote native plant re-establishment.

Table 2-3:
Project Design Features and Best Management Practices

Before ground-disturbing activities begin, identify and locate project related equipment staging areas throughout the SUP. Treat existing noxious weeds in these areas prior to the staging of any equipment. Equipment will be washed prior to any construction activities. This includes construction personnel vehicles in addition to trucks and other heavy equipment.
Weed infestations identified before project implementation that are within the project area should be treated or "flagged and avoided" according to the species present and project constraints. The noxious weed coordinator will be given 1) sufficient time to arrange for treatment of the weeds, 2) will be provided all known locations of the weeds.
Monitor construction areas and roadways used to access the 2010 project sites within the SUP area annually for at least three growing seasons and treat any noxious weeds found. Annually inspect all parking lots and areas surrounding guest service and maintenance facilities at the base of the ski area within the SUP area and document and treat any new noxious weed infestations.
SOILS & WATERSHED
Ground disturbing activities will be conducted in accordance with Heavenly's Revised Construction Erosion Reduction Program.
When logging over the snow, conditions should allow for 1 foot of packed snow to be continuous (i.e., not patchy) and competent enough so that wheeled or tracked vehicles do not break through. When logging over frozen ground, a minimum of 3 inches of continuous frozen ground should be present.
Existing, native ground cover will be preserved to the extent possible during construction to minimize erosion.
Existing roads would be used for construction and routine maintenance of any approved project components.
Surface netting in conjunction with mulching will be used to reduce the erosion hazard.
Vegetative removal within the SEZ would be minimized..
In all areas where approved grading or soil disturbance will occur, topsoil when present, will be separated, stockpiled and re-spread following slope grading and prior to re-seeding.
Soil-disturbing activities will be avoided during periods of forecasted heavy rain.
Areas determined by the Forest Servcie to have been compacted by construction activities may require mechanical sub-soiling or scarification to the compacted depth to reduce bulk density and restore porosity.
AIR QUALITY
To the extent feasible, site improvements would be installed promptly in order to reduce the potential for dust emissions. The area disturbed by clearing, earth moving, or excavation activities would be kept to a minimum at all times, allowing improvements to be implemented in sections.
Areas approved for ground disturbance and construction access roads will be watered as necessary and practical to prevent excessive amounts of dust.
WETLANDS
Flag and avoid all wetlands during construction of new trails in the Galaxy pod.

Chapter 3

Affected Environment and Environmental Consequences

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

Chapter 3 defines the biological and human environments of the project area and the potential changes (direct, indirect, and cumulative impacts) to those environments due to implementation of the alternatives. Chapter 3 presents the scientific and analytical basis for comparison of alternatives presented in Table 2-2.

PAST, PRESENT, AND REASONABLY-FORESEEABLE FUTURE PROJECTS

Heavenly's 2007 Master Plan Amendment

In 2007, Heavenly's 1996 Master Plan (MP 96) was amended with the MPA 07, which resulted from the preparation of a comprehensive, multi-jurisdictional environmental analysis to satisfy the requirements of the National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), and TRPA regulations. This three-tier document—an Environmental Impact Report/Environmental Impact Statement/Environmental Impact Statement (EIR/EIS/EIS)—analyzed the potential effects of the MPA 07 on the human and biological environment that satisfied the needs of the Forest Service, TRPA, Alpine County and El Dorado County.[17] Full build-out of the MPA 07 is summarized here:

- Total PAOT capacity of Heavenly would remain at the approved MP 96 level of 16,125 (while the skier-at-one-time or SAOT would decrease slightly from 18,100 to 18,096). There would be an increase of "in-basin" PAOT/SAOT and a decrease of "out-of-basin" PAOT/SAOT.

- 37 lifts (23 aerial lifts and 14 surface lifts) with a total hourly uphill capacity of 52,020 persons per hour (pph), 10 support facilities, four maintenance facilities, 812.5 acres of trails, and 528.4 acres of snowmaking.

- Total snowmaking acreage would increase by approximately 30 acres, from 499 acres (existing plus previously approved from the MP 96)to 529 acres, but should not result in a net increase in water use/consumption due to changes in run prescriptions (as described in Appendix 3 of the MPA 07).

- No increase in the total capacity for support facilities, but two lodge locations (different than those in MP 96) and a slight increase in floor area and land coverage are planned. Total area of lodges and support facilities in the MPA 07 is 247,682 square feet—an increase of 11,079 square feet as compared to the MP 96 (5 percent increase).

[17] Douglas County, Nevada was involved by reviewing the environmental documents and providing comments, but had no environmental documentation requirements pertaining to the MPA 07.

- A zipline adventure ride, a multi-faceted interpretive center, a performance amphitheater, the Discovery Forest including an adventure center, and a wedding arch. The summer uses and associated facilities would be located at the Top of the Gondola and Von Schmidt's Flats Area. Hiking trails were also included to provide a better hiking experience by relocating them from existing summer maintenance roadways to paths through the mountain forest.

The EIR/EIS/EIS analyzed Phase I projects site specifically, while Phase II and III projects were analyzed at the programmatic level. For the purposes of this EA, the MPA 07 represents the basis for identifying past, present, and reasonably-foreseeable future actions that warrant cumulative affects analysis. The approved, implemented Phase I MPA 07 represents the past and present actions within the SUP area. The approved/unimplemented Phase I, and future Phase II and III projects, represent the reasonably-foreseeable future actions that are likely to occur within the SUP area.

Past and Present Actions

For the LTBMU, the 2007 EIR/EIS/EIS fulfilled the requirements of NEPA at the site specific level for Phase I projects. The June 2007 Record of Decision signed by the Forest Supervisor documented the decision for Phase I Projects only, and indicated that Phase II and III project will require site-specific NEPA analysis prior to their implementation. Therefore, the decision did not include any Phase II or III project approvals. Alternative 5, with modifications, was the Selected Alternative; to date, Heavenly has implemented many of these approved projects. Phase I projects that were approved, but are yet to be implemented within Heavenly's SUP area, are identified below.

Approved Phase I that have been implemented include:

- Replace the Olympic (Lift T) chairlift with a new detachable quad
- Three new gladed trails (G9, I4 and I5) in Powederbowl and Sky Express Pods
- A new intermediate connector trail (V12) from *Lower Orion's* to the base of the Dipper Express
- Three new trails (S8, S9 and S10) in the North Bowl pod
- Regrade the *Skyline Trail*/Summer Road
- A zipline from near the top of Tamarack Express lift to near the top of the gondola (Adventure Peak)
- Nordic/snowshoe/sledding area

Phase II projects implemented through site specific approval

- Expand tubing (Adventure Peak)

REASONABLY FORESEEABLE FUTURE ACTIONS

Phase I Projects – Approved/Not Yet Implemented[18]

- North Bowl lift replacement
- Snowmaking on *Skyline Trail*
- Powderbowl Lodge
- Additional Hiking/Nordic/snowshoe trails
- Skier ramp at the Gondola top terminal
- Relocate a section of the existing *Skyline Trail* near Picture Rock, to the intersection with Milky Way Bowl

Phases II and III – Require site-specific NEPA analysis and approval

- Relocate Lower California maintenance shop to off-site location
- Lift HH (Von Schmidt's allocation)
- Implement trails H12, H13, R3, R4, 13, 14, 18, V11
- Implement trails 1, 6, 5A, 12 and W5
- Realign trail 6 (Upper Nevada Run- Decommission R531-R539)
- Add snowmaking on trails S8, S9, S10
- Add snowmaking on trails: E2, G4, G8, G9, H5, I2, GG2, GG5, HH2, HH3, R1, R2, S2, S3, S4, S6, S7, U1, U2, U4, V3, V5, V12, W1, W2, 10, 13, 14
- Replace Lift E (Patsy's)/Lift F (Groove) with quad
- Replace Lift Q (Boulder)
- Construct in-ground half-pipe
- Remodel and expand vehicle maintenance shop at top of tram
- Angel's Roost communications site improvements

[18] Although Phase I projects have been site-specifically approved by the LTBMU, in-basin Phase I projects would require TRPA governing board approval prior to implementation.

- Trail widening – Nevada
- Trail widening – California
- Replace and relocate Lift DD (Mott Canyon) with high speed detachable quad lift
- Construct Lift J (Big Juniper) high speed detachable quad lift
- Construct Sand Dunes restaurant/lodge
- Construct Mid Station restaurant
- Construct Boulder Lodge skier services building/expand existing deck
- Replace California base lodge
- Relocate California snowmaking building
- Replace and relocate Lift A (aerial tram) with high speed detachable quad lift
- Replace Lift N (Pioneer) with quad
- Construct Lift Z (Wells Fargo)
- Implement trails Z1, Z2, Z3, Z4, Z5, Z6, Z7, Z8, 15, 16, and17
- Add snowmaking on trails Z1, Z2, Z3, Z4, Z5 and Z7
- Kids Camp (California Base)
- Replacement of Lift K (Perfect Ride), Ski Lift L (Cal Ski School) and Ski Lift M (Enchanted Forest)
- Trails K1, L1 and M1
- Implement Gondola Top Station amphitheatre
- Implement Gondola Top Station interpretive center
- Expand existing deck at Stagecoach Lodge
- Implement Discovery Forest (an adventure center and wedding arch)

A. RECREATION AND MOUNTAIN OPERATIONS

SCOPE OF THE ANALYSIS

The scope of this recreational analysis is specific to areas within Heavenly's SUP boundary where projects are proposed, including: the top of the Gondola; the Galaxy, Dipper, and Comet lifts on the Nevada side of the resort; Snow Beach; and *California Trail*.

AFFECTED ENVIRONMENT

Summary of the Recreational Experience at Heavenly

The development of trails, lifts, infrastructure, and skier facilities has occurred on NFS lands at Heavenly since the ski area's inception in 1955. Almost six decades later, Heavenly offers roughly 4,800 skiable acres of terrain (composed of 94 trails as well as numerous chutes, bowls and glades) across NFS lands within its 7,200-acre SUP area and adjacent private lands. This gives Heavenly the distinction of being the largest ski area in California. A typical season lasts from mid-November through mid-April, averaging 360 inches of snowfall.

Heavenly's terrain classification is roughly 20 percent Beginner, 45 percent Intermediate, and 35 percent Advanced/Expert.

Four base areas—two in Nevada and two in California—provide access to Heavenly's lift and terrain network. Terrain is serviced by 29 lifts, which include:

- 1 detachable eight-passenger gondola
- 1 tram
- 2 high-speed, detachable "six-pack" chairlifts
- 7 high-speed, detachable quad chairlifts
- 6 fixed-grip triple chairlifts
- 3 fixed-grip double chairlifts
- 6 surface lifts
- 3 magic carpets

Six on-mountain guest service facilities (of varying sizes and functions) are located across the SUP area. In the off-season, a network of mountain roads provides access throughout the SUP area for maintenance and operational needs.

Snowmaking

Heavenly provides snowmaking coverage on approximately 310 acres of terrain. A variety of ability levels are accommodated, including: 5 percent of Beginner terrain, 28 percent of Novice terrain, 60 percent of Intermediate terrain, and 8 percent of Expert terrain.

As per the MPA 07, Heavenly consumes approximately 4.0 acre feet of water per acre of terrain covered with snowmaking. Throughout the ski industry, this is considered high, and is due to the existence of natural obstacles (primarily boulders) within and throughout the developed trail network. These obstacles were intentionally left in place during trail construction to minimize/avoid soil disturbance and subsequent erosion after overstory vegetation was removed.

California Trail is a good example of the volume of natural obstacles left within a developed trail (refer Photo 1, Chapter 1). This trail is an important component of the Intermediate skiing and riding experience at Heavenly as it is easily accessible from the top of the Gondola area, can be repeatedly skied by a single lift ride—the Tamarack Express—and is high-capacity. Due to the height of natural features such as boulders and downed trees, up to 5 feet of snow coverage is necessary before *California Trail* can be opened. Therefore, in the early season and during low-snow years, Heavenly uses large amounts of energy and water resources for making snow on *California Trail*.

Utilization and Density on Key Nevada-Side Lifts and Terrain

In order to understand the utilization and density of key Nevada-side lift and terrain, an analysis was conducted employing standard mountain planning methodologies and assumptions. The Utilization and Density Analysis is contained in the project file.[19]

Lift Utilization Analysis

Five primary repeat-ski chairlifts on the Nevada side are critical to Heavenly's operations. Four of these lifts provide some of the most consistent and highest quality Intermediate level experiences at Heavenly, including Dipper Express, Comet Express, Olympic Express, and Galaxy. The Mott Canyon lift accesses primarily Expert terrain. This analysis focuses on the four Intermediate chairlifts. As shown in Table 3A-1, below, the Utilization and Density Analysis shows an over utilization of the Dipper and Comet Express chairlifts, and an underutilization of the Galaxy lift (and to a lesser extent, Olympic Express, and Mott Canyon). The effects of this are long lift lines and higher skier densities at Dipper and Comet; with lower densities and short, or no, lift lines at the other lifts. If a lift is underutilized, the implication is that not all chairs on the lift are full, meaning that fewer skiers are heading down onto the associated trails, resulting in lower trail densities.

[19] SE Group, 2010 Project Record Document 5

In order to understand how skier and riders distribute throughout this portion (i.e., Nevada) of the ski area, it is important to examine how these chairlifts are accessed. The following four routes provide access to these five chairlifts:

1. From the Stagecoach base area, guests can ride the Stagecoach Express, then ski down *Pepi's* trail to access the bottom terminals of either Comet or Dipper Express, or ski north down Upper North Bowl trail to the base of the Olympic Express.
2. From the Boulder base area, guests can ride the Boulder and North Bowl chairlifts, then ski down *Pepi's* trail to access the bottom terminals of either Comet or Dipper, or ski Upper North Bowl down to the base of the Olympic Express.
3. From the top of the Gondola (starting at the Heavenly Village base), skiers can ride the Tamarack Express lift, and from there access any of the lifts in the analysis area.
4. From the California Lodge base area, guests can work their way up to the Sky Meadows area. From there, they can ride the Sky Express and then across *Skyline Trail* to any of the chairlifts.

Table 3A-1 provides a summary of the utilization analysis for these chairlifts.

Table 3A-1:
Utilization Analysis for Intermediate Chairlifts on the Nevada Side – Existing Conditions

Lift Name	SAOT	Hourly Capacity	Percent Repeat Skiing	Percentage to Olympic Express	Percentage to Comet Express	Percentage to Dipper Express	Percentage to Galaxy	Percentage to Mott Canyon	Percent to Other Parts of the Resort	Total
LIFTS THAT CONTRIBUTE SKIERS										
Stagecoach Express	1,090	2,400	30%	30%	20%	20%	-	-	-	100%
North Bowl	602	1,200	30%	30%	20%	20%	-	-	-	100%
Tamarack Express	748	2,400	40%	5%	25%	25%	5%	-	-	100%
Sky Express	944	2,400	40%	-	20%	20%	10%	10%	-	100%
REPEAT-SKI LIFTS										
Olympic Express	1,003	2,400	40%	-	10%	10%	-	-	40%	100%
Comet Express	854	2,400	40%	10%	-	5%	5%	-	40%	100%
Dipper Express	917	2,400	40%	5%	5%	-	5%	5%	40%	100%
Galaxy	613	1,200	20%	-	15%	15%	-	-	50%	100%
Mott Canyon	333	1,000	50%	-	5%	5%	-	-	40%	100%
TOTAL HOURLY DEMAND (GUESTS)				2,520	3,350	3,350	840	860	-	-
LIFT HOURLY CAPACITY (GUESTS)				2,400	2,400	2,400	1,200	1,000	-	-
UTILIZATION INDEX	-	-	-	105%	140%	140%	70%	86%	-	-

Notes:
Skiers-at-one-time (SAOT) and hourly capacity numbers are from MPA 07 by International Alpine Design.
Utilization percentages and analysis are per SE Group.
SAOT numbers shown for reference only, hourly capacity numbers are used for utilization analysis.
"Percent transferring to other parts of the resort" refers to skiers who, after riding the given lift, go to different lift (which could be one of those listed in the first section of the table), to any base area, to a restaurant, etc.—simply to anywhere other than to one of the analyzed lifts

Table 3A-1 allocates percentages of hourly capacity per lift to either repeat skiing, transferring to another lift in the analyzed group, or transferring to other chairlifts or facilities at Heavenly. The percentages are then converted to skiers per hour from each lift and then summed in the "Total Hourly Demand" row. This is the modeled number of skiers per hour that are expected to arrive at the bottom of the given lift. The total hourly demand is then compared to the hourly uphill capacity of that lift.

The bottom line of the table is the "Utilization Index" which is a comparison of supply versus demand. A Utilization Index of 100 percent implies optimal utilization of a lift, where all seats on a carrier are full, but there should not be overly long lift lines at any given time. A utilization index below 100 percent implies that the lift is underutilized; there are fewer people showing up at the bottom of the lift on an hourly basis than the hourly capacity of the lift, meaning that lift lines are unlikely and that carriers are frequently empty. A utilization index of over 100 percent implies that the lift is over-utilized. The fact that more people arrive at the bottom of the lift than the lift has the capacity to handle means that lift line waits are common.

The existing utilization rates of the Comet and Dipper Express chairlifts are quite high as compared to low utilization rates of the Galaxy lift. Table 3A-1 indicates that the Olympic Express likely has a comfortable level of utilization (105 percent), the Comet and Dipper Express chairlifts are over-utilized (both at 140 percent), and the Galaxy and Mott Canyon lifts are currently underutilized (70 and 86 percent, respectively). Due to the ease of accessibility and quality/quantity of terrain, the Comet and Dipper Express chairlifts receive heavy use. This level of over-utilization results in frequent occurrences of substantially long lift lines. While the Comet and Dipper Express chairlifts are over-utilized (25 minute wait times are common), the Galaxy lift is *underutilized* (often lacking lift lines of any kind) because it is difficult to access, there is limited repeat-ski terrain (*Galaxy* and *Perimeter*), and the lift is outdated and slow (a 12.5-minute lift ride compared to a 3.6 minute lift ride on Comet Express or a 4.9 minute lift ride on Dipper Express).

Galaxy Terrain Density Analysis

An important aspect of ski area planning is balancing uphill lift capacity with downhill trail capacity, which results in an optimal recreational experience. An effective method of analyzing this balance is to calculate on-trail skier densities. Trail densities are derived by contrasting the uphill, skiers-at-one-time (SAOT) capacity of each lift system with the trail acreage associated with each lift. Empirical observations and calculations indicate that on an average day, approximately 40 percent of the skiers and riders at a resort are on the trails at any given time. It should be noted that this calculation shows average densities across the available terrain; however, areas on the trails such as merge/convergence areas, lift milling areas, major circulation routes, and egress routes, typically experience higher densities periodically during the ski day.

Table 3A-2 shows the calculation of the existing densities for the Galaxy lift terrain. The average density for the Galaxy terrain is well within the target range of skiers-per-acre for the specific ability level of terrain in the area, meaning that the recreational experience is ideal from a density perspective.

Table 3A-2:
Terrain Density Analysis for Galaxy Lift – Existing Conditions

Lift Name	SAOT	On-trail Percentage	Skiers on-trail	Trail Acreage	Average Skiers per Acre	Target Density Range
Galaxy Lift	613	40%	245	24.6	10	7–18

Notes:
Existing Galaxy SAOT and trail acreage numbers are from the MPA 07 by International Alpine Design.
As discussed, on-trail percentage is assumed (based on industry averages), not calculated.
Target density range source is SE Group and is a based on industry average numbers.

Top of the Gondola

The Lake Tahoe Gondola is located in California, one-half block west of the Nevada state line. This location puts it within walking distance of most of South Lake Tahoe's major lodging facilities (nearly 5,000 hotel rooms) and casinos. On almost a year-round basis (it is closed twice a year for maintenance) eight-passenger gondola cabins take guests 2.4 miles up the mountain in 12 minutes. A 14,000-square foot mid-station observation platform located at 9,123 feet treats guests to views of the Carson Valley, the Desolation Wilderness and Lake Tahoe.

Of Heavenly's four base areas, the MPA 07 identifies the Gondola as the predominant mountain access point; roughly 40 percent of skiers and riders, and all summer guests, access the mountain from the Gondola. Essentially, Heavenly "opens and closes" through the Gondola each ski season, making this a critical component of Heavenly's operations. The top of the Gondola is thus a focal point for summer and winter activities, hosting Adventure Peak (snowtubing, the zipline, snow bikes, and snowshoeing) and teaching terrain, and restrooms. Once skiers and riders unload the Gondola, they can immediately access the Tamarack Express or Big Easy lift, or descend *California Trail*, to access Heavenly's up-mountain lift and terrain network.

On-Mountain Guest Services

On-mountain guest services at Heavenly are limited. Six facilities, located throughout the SUP area, offer varying degrees of food and beverage service. Since approval of the Master Plan in 1996, no new lodge facilities have been developed; however, most of them have been remodeled. These include:

- The East Peak Lodge
- The Umbrella Bar at the top of the Gondola

- The Deck/Café Blue at the Gondola mid-station
- The Sky Deck at the bottom terminal of the Sky Express
- Snow Beach at the bottom terminal of the Powderbowl Express
- The Lakeview Lodge at the top of the tram

In addition to these six facilities, an outdoor barbeque, modular kitchen, and outdoor seating area are located at the top of the Gondola.

The East Peak Lodge is the only on-mountain facility located in Nevada. All other facilities are located in California. The total number of indoor seats available at these six facilities is approximately 1,060 (Snow Beach and the Sky Deck only offer outdoor seating, while the other facilities offer a mix of indoor and outdoor seats). For a resort the size of Heavenly, on-mountain, indoor seating is a constraint, and these facilities often experience crowding, especially during weekends, holidays, and inclement weather.

Given the Gondola's pivotal role in mountain access for year-round activities and its central location for skiers and riders moving between the California and Nevada sides of the resort, guest services (particularly indoor seating) at the top of the Gondola are an acknowledged constraint. The Umbrella Bar, with a capacity of approximately 100 people, does not provide indoor seating or guest services beyond basic food and beverages. Therefore, during periods of cold temperatures and inclement weather, resort visitors do not have an opportunity to get inside to eat, relax, or escape the elements. Given the existing guest services situation at the top of the Gondola, beginner level guests must download the Gondola for access to indoor facilities in Heavenly Village. More experienced skiers and riders can disperse across the mountain to locations with indoor guest service facilities; however, this requires a large commitment of time and energy, and is not ideal.

Snow Beach is located at the base of *Patsy's* and *Maggie's* trails and provides visitors using *Patsy's* trail as well as those returning from upper portions of the California side of the resort with restrooms and limited food and beverage services. The existing facility is approximately 790 square feet in size and serves a limited function, with roughly 80 outdoor seats/tables and no indoor or covered seats. Although small and under-appointed, Snow Beach serves an important guest service function at Heavenly, offering an attractive stop for skiers and riders moving between the California Lodge base area and the rest of the mountain throughout the day. It also serves the Groove Terrain Park as well as Ski School teaching areas located on Patsy's and Powderbowl Intermediate terrain.

The MPA 07 envisioned a seasonal, open-air shelter at Snow Beach to accommodate additional seating, as well as additional food service and barbeque equipment capabilities.

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Selection of the No Action Alternative would not lead to any change in recreational offerings or experiences throughout the Heavenly SUP area. Because Alternative 1 does not address identified opportunities and constraints (refer to the Purpose and Need in Chapter 1) selection of this alternative would eventually lead to a diminished recreational experience at Heavenly.

On-mountain, indoor guest services would continue to be a constraint Heavenly, particularly at the top of the Gondola, which is central to Heavenly's year-round operations. Due to limited terrain and a slow, aging lift, the Galaxy lift would continue to be underutilized, while other Intermediate chairlifts (e.g., Dipper and Comet) would be over-utilized. Finally, Heavenly would continue to focus large amounts of energy and water resources on opening *California Trail* each season.

Some of the approved Phase I MPA 07 projects have not been implemented to date. Because impacts related to these projects were analyzed site specifically and approved for implementation, they require no further analysis and may be implemented even if the No Action Alternative is selected. Approved, unimplemented Phase I MPA 07 projects that will provide additional recreational benefits throughout the Heavenly SUP area include:

- North Bowl Lift replacement
- Snowmaking on *Skyline Trail*
- The Powderbowl Lodge
- Hiking/Nordic/snowshoe trails at the top of the Gondola
- A skier ramp at the Gondola top terminal

Alternative 2 – The Proposed Action

Snowmaking

Under the Proposed Action, all trails associated with the expanded Galaxy Express chairlift—totaling approximately 48 acres—would have snowmaking coverage. This would improve the consistency of this terrain, and would allow Heavenly to open the Galaxy Express earlier each season, thereby improving the skiing/riding experience on this important Intermediate terrain.

Implementation of the ESRHR Prescription on a section of *California Trail* would be both an operational and recreational benefit to Heavenly. By reducing the height of natural obstacles on this important trail, less time, energy, and water would be consumed in an attempt to open it. This would allow *California*

Trail to open for the important holiday period, and would allow Heavenly to focus its snowmaking time and resources elsewhere.

Utilization and Density on the Galaxy Express and Other Key Nevada-Side Lifts

Lift Utilization Analysis

Figure 3, and Table 3A-3, depicts lift utilization under the Proposed Action with an upgraded Galaxy Express chairlift, including four new trails (U3, U4, 14, and 15)—totaling 23.7 acres—which would supplement the existing *Galaxy* and *Perimeter* trails and the *Galaxy Glades*. The four proposed trails would serve to make the repeat-skiing more extensive and varied, therefore serving to hold the interest of skiers and riders for multiple round trips. The increase in repeat skiing within the Galaxy pod (as evidenced between Table 3A-1 and Table 3A-3) - from 20 percent under existing conditions to 35 percent under the Proposed Action – indicates that the lift upgrade and additional terrain would serve to hold skiers' and riders' interest for longer, and is therefore an improved recreational experience.

Two of these proposed trails (U3 and U4)—totaling 9.6 acres—would be repeatable, essentially providing more options between the existing *Perimeter* and *Galaxy* trails. The other two proposed trails (14 and 15) would drop down from the top of the Stagecoach Express to the base of the Galaxy Express, totaling 14.1 acres. The lower halves of trails 14 and 15 could be repeat-skied on the Galaxy Express by using *Nevada Trail*, but their upper halves would only be accessible from the top of the Stagecoach Express. Proposed Trails 14 and 15 would serve the dual purpose of providing more repeat skiing opportunities as well as improving the accessibility to the Galaxy Express from the Stagecoach Express. The Galaxy Express and associated terrain would be especially beneficial when the upper mountain is on wind hold (and the Dipper, Comet and Tamarack Express lifts are closed).

Table 3A-3 shows how circulation patterns would change as a result of these four proposed trails, in conjunction with the upgraded Galaxy Express.

Table 3A-3:
Utilization Analysis for Selected Lifts – Proposed Conditions

Lift Name	SAOT	Hourly Capacity	Percent Repeat Skiing	Percentage to Olympic Express	Percentage to Comet Express	Percentage to Dipper Express	Percentage to Galaxy Express	Percentage to Mott Canyon	Percent Transferring to other parts of the resort	Total
LIFTS THAT CONTRIBUTE SKIERS										
Stagecoach Express	1,090	2,400	30%	25%	10%	10%	25%	-	-	100%
North Bowl	602	1,200	30%	30%	20%	20%	-	-	-	100%
Tamarack Express	748	2,400	35%	5%	20%	20%	20%	-	-	100%
Sky Express	944	2,400	40%	-	15%	15%	20%	10%	-	100%
REPEAT-SKI LIFTS										
Olympic Express	1,003	2,400	40%	-	10%	10%	-	-	40%	100%
Comet Express	854	2,400	35%	10%	-	5%	10%	-	40%	100%
Dipper Express	917	2,400	35%	5%	5%	-	10%	5%	40%	100%
Galaxy Express	*1,370*	*2,400*	35%	-	10%	10%	-	-	45%	100%
Mott Canyon	333	1,000	50%	-	5%	5%	-	-	40%	100%
TOTAL HOURLY DEMAND (GUESTS)				2,400	2,810	2,810	2,880	860	-	-
LIFT HOURLY CAPACITY (GUESTS)				2,400	2,400	2,400	*2,400*	1,000	-	-
UTILIZATION INDEX	-	-	-	100%	117%	117%	120%	86%	-	-

Notes:
SAOT and Hourly Capacity numbers are from the MPA 07 by International Alpine Design.
Utilization percentages and analysis are per SE Group.
SAOT numbers shown for reference only, hourly capacity numbers are used for utilization analysis.
"Percent transferring to other parts of the resort" refers to skiers who, after riding the given lift, go to different lift (which could be one of those listed in the first section of the table), to any base area, to a restaurant, etc.—simply to anywhere other than to one of the analyzed lifts.
Italicized lift statistics indicate proposed changes from existing conditions

Table 3A-3 shows the increased number of skiers able to access the Galaxy Express, as a result of the proposed trail additions. It also shows anticipated changes to circulation and distribution as a result of the lift replacement and upgrade. These changes, taken together, would likely decrease utilization of the Comet and Dipper Express chairlifts (140 percent versus 117 percent), increase utilization of the Galaxy Express chairlift (70 percent versus 120 percent), and have little to no effect on the utilization of the Olympic and Mott Canyon lifts (100 and 86 percent, respectively). As noted, it is anticipated that repeat skiing and riding on the Galaxy Express chairlift would increase from 20 percent under existing conditions to 35 percent with the proposed projects.

Thus, under the Proposed Action, the utilization of the Galaxy, Dipper and Comet Express chairlifts would be expected to be very similar. This is a common occurrence when a fixed-grip lift serving similar types of terrain as an adjacent high-speed lift is upgraded to a detachable lift. Since all three lifts and terrain would become more similar in experience, it is reasonable to assume that skiers would tend to more evenly distribute between their options. The utilization rates of between 117 percent and 120 percent for the Comet, Dipper and Galaxy Express chairlifts imply that lift lines would likely be present during periods of high visitation, but would not be expected to be unacceptably long.[20]

Terrain Density

As Table 3A-4 indicates, the average skier density for terrain associated with the Galaxy Express under the Proposed Action would increase over existing conditions—a 30 percent increase. This reflects the higher number of skiers anticipated to be using the Galaxy Express terrain. However, both the existing and proposed density figures are well within the target range of skiers-per-acre for the specific ability level of terrain, and a quality recreational experience would remain.

Table 3A-4:
Terrain Density Analysis for Galaxy Lift – Existing and Proposed Conditions

Lift Name	SAOT	Assumed on-trail Percentage	Skiers on-trail	Trail Acreage	Average Skiers per Acre	Target Density Range
Existing Galaxy Chairlift	613	40%	245	24.6	10	7–18
Proposed Galaxy Express	1,370	40%	548	41.2	13	7–18

Notes:
Existing Galaxy SAOT and trail acreage numbers are from the MPA 07 by International Alpine Design.
Proposed Galaxy SAOT is from the MPA 07 by International Alpine Design. Proposed trail acreage is calculated based on adding the increase of repeat-skiable acreage to the existing acreage.
As discussed, on-trail percentage is assumed (based on industry averages), not calculated.
Target density range source is SE Group and is a based on industry average numbers adjusted for the proposed mix of terrain ability levels. Existing terrain and most proposed terrain is Low Intermediate ability level, with a small percentage Intermediate level terrain (Trail 14).

[20] For reference, Table 3A-1 indicates a 140 percent utilization rate for the Comet and Dipper Express, which equates to a roughly 20 to 25 minute lift line (both calculated and observed). A 120 percent utilization rate equates to a roughly 10 to 15 minute lift line.

The effect of installing the Galaxy Express on skier densities within the Comet and Dipper Express terrain would vary by visitation levels and operational considerations, as discussed in the following three scenarios:

1. Peak visitation-level days: On these days, there would not be any anticipated decrease to on-trail skier densities on terrain served by the Comet and Dipper Express chairlifts. Since demand for these lifts would remain high, every seat on every chair would be assumed to be full (except for unavoidable decreases due to loading inefficiencies), and there would be lift lines. The result is that skier densities would remain at existing levels—lift lines would be shorter, but there would still be the same number of skiers per hour unloading from the top of each lift and heading down onto the trails. Since there is no proposed increase to skiable terrain available off of these lifts, skier densities on the terrain would remain the same as under existing conditions.

2. Average or lower visitation days: On average or lower visitation days, it is likely that skier densities would decrease on terrain served by the Comet and Dipper Express chairlifts. Since the Galaxy Express would be both easier to access and more attractive (as compared to existing conditions), it is reasonable to assume that some of the skiers who would have been using the Comet or Dipper Express chairlifts would now choose to ride the Galaxy Express. This would result in some percentage of empty chairs going up those lifts, resulting in lower numbers of skiers on the trails, with commensurately lower skier densities.

3. Wind event days: It is not uncommon for the Comet and Dipper Express chairlifts to be placed on wind hold during particularly windy days. Due to the lower elevation and exposure of the Galaxy Express, it is not, and would not be subject to wind closures as frequently as the Comet or Dipper Express chairlifts. Due to the increased accessibility and improved quality of overall ski experience, it is reasonable to assume that the Galaxy Express chairlift would receive very high demand and use during these wind hold events.

Top of the Gondola

As noted, due to the limited number of on-mountain, indoor seats, Heavenly's six on-mountain guest service facilities often experience crowding, particularly during weekends, holiday periods, and inclement weather. In addition, Heavenly does not currently offer suitable guest services at the top of the Gondola, which is a popular summer tourist venue.

Therefore, an appropriately-sized, appointed, and sited guest services facility would benefit the recreating public at Heavenly during both the winter and summer seasons. Designed specifically in response to Heavenly's shortage of indoor seating, the Gondola Lodge is strategically located to benefit the entire range of guests that visit Heavenly through the year, including skiers and riders, people recreating at Adventure Point, ski school patrons, and summer/winter sightseers. It would accommodate existing and

future visitor use patterns, and maintain the quality of services that guests have come to expect at multi-season resorts.

In conjunction with construction of the Gondola Lodge, the existing children's magic carpet ski school lift would be relocated to the Discovery Forest area near the *Big Easy* trail (refer to Figure 2). By relocating this magic carpet, beginner-level ski school opportunities for children would be maintained, and adequate separation between the carpet and the new lodge would be maintained. Thus, the recreational experience would not be affected with the relocation of this carpet.

Snow Beach

The Umbrella Bar is a functional structure, and relocating it to Snow Beach would provide a cost-effective and logical way of meeting Heavenly's need to provide additional indoor and outdoor seating (approximately 100 people) and limited food service in this area. As previously noted, this is consistent with the MPA 07, which envisioned a seasonal, open-air shelter at Snow Beach to accommodate additional seating, as well as additional food service and barbeque capabilities.

CUMULATIVE EFFECTS

The Introduction to Chapter 3 identifies past, present and reasonably-foreseeable future projects within the Heavenly SUP area with potential to affect the recreational experience at Heavenly. All past projects underwent site-specific environmental analysis compared to the baseline recreational experiences/conditions prior to their approval. Future projects, including Phase II and III projects in the MPA 07 which have been analyzed programmatically will necessitate site specific analysis before they can be approved or implemented; the potential effects of which will be compared against the baseline aesthetic conditions.

A summary of the cumulative recreational impacts of full build-out of the MPA 07 includes:

- A total of 37 lifts (23 aerial lifts and 14 surface lifts) as compared to the existing 29 lifts.
- A total of ten guest service facilities located across the ski area (NFS and private lands), compared to the existing six facilities.
- A developed terrain network consisting of roughly 813 acres of developed trails (compared to the existing 662 acres). This includes the addition of an entirely new trail pod—Wells Fargo.

As discussed previously, under the No Action Alternative, approved Phase I MPA 07 projects may be implemented throughout the SUP area, regardless of which alternative is selected. If implemented, these projects, reiterated below, will provide recreational benefits within the Heavenly SUP area, including increased lift capacity, improved snowmaking coverage, additional on-mountain guest services, and added non-skiing and summer recreational opportunities. These include:

- North Bowl lift replacement
- Snowmaking on *Sky Trail*
- The Powderbowl Lodge
- Hiking/Nordic/snowshoe trails at the top of the Gondola
- A skier ramp at the Gondola top terminal

The Powderbowl Lodge, a 25,000-square foot facility approved for construction at the top of the Powderbowl Express, is unlikely to be constructed in the near future due to several factors, including: construction costs, the site location (difficulty of construction access), and high utility/infrastructure costs.

This recreational analysis does not identify any negative cumulative effects of implementing the 2010 Capital Projects along with approved/unimplemented Phase I MPA 07 projects and yet-to-be approved Phase II and III projects. Cumulatively, approval and implementation of the entire MPA 07 would dramatically improve the recreational opportunities afforded throughout the SUP area.

It is worth noting that climate change is likely to affect recreational resources, and therefore resort operations, within the Heavenly SUP area. Climate change will lead to warmer, drier winters and will increase the importance of snowmaking in the early season, and possibly the mid-season. This could affect the both the opening and closing dates of the resort, depending on the season.

B. SCENERY RESOURCES

SCOPE OF THE ANALYSIS

Analysis of the scenic environment requires an evaluation of the project area and its ability to absorb the effects of both historic and ongoing human modification. Slope, natural vegetation types and patterns, topography, and viewing distance are important factors in this analysis. Development of on-mountain/base area facilities and infrastructure, as well as developed trails, at Heavenly has occurred gradually since 1955. For this analysis, the potential impacts to the scenic environment were considered in relation to the overall existing development/recreational theme of the resort and adjacent private lands.

FOREST SERVICE DIRECTION

The exceptional visual quality of the Lake Tahoe Basin is important to local residents and visitors as tourism is a major contributor to the economy of the region. The 1988 LTBMU Forest Plan Record of Decision advises that the "location and design of ski areas will be carefully considered to maintain the visual quality."[21]

Forest Plan Direction

As per the 1988 Forest Plan, "structures and improvements [within the Heavenly Valley Management Area] will be attractive and harmonious with a rural mountain ski development setting as viewed in the foreground."[22] Furthermore,

> *Visual impacts of ski trails will not be resolved in the near term. Natural and man-assisted revegetation may soften the visual contrast between the ski trails and adjacent forest land over the long term. The "feathering" landscaping technique commonly used to make ski trails will be used sparingly because of the adverse water quality effects of large scale tree removal. Use of darker color shrubs on the runs may provide a solution to the undesirable color contrast.*[23]

Visual Management System

The goal of scenic resource management on all NFS lands is to manage for the highest possible visual quality, commensurate with other appropriate public uses, costs, and benefits. Since the mid-1970s, the Forest Service has operated under the guidance of the Visual Management System (VMS) for inventorying, evaluating, and managing scenic resources on NFS lands. The VMS is defined in National Forest Landscape Management, Volume 2.[24]

[21] USDA Forest Service, 1988b
[22] USDA Forest Service, 1988a p. IV-107
[23] Ibid. p. IV-108
[24] USDA Forest Service, 1974

Visual Quality Objectives

NFS lands are assigned Visual Quality Objectives (VQOs) that define the degree of acceptable change to the visual resource from human created management activities. VQOs are based on the physical characteristics of the land and the sensitivity of the landscape setting as viewed by humans. VQOs define how the landscape will be managed, the level of acceptable modification permitted in the area, and under what circumstances modification may be allowed. VQOs—from most to least constrained—include: Preservation, Retention, Partial Retention, Modification, and Maximum Modification.[25] NFS lands within the Heavenly SUP area have been assigned the *Partial Retention* VQO, which is common for ski areas that are permitted on NFS lands. The Partial Retention VQO is defined as:

> *Management activities remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, or texture common to the characteristic landscape but changes in their qualities of size, amount, intensity, direction, pattern, etc., remain visually subordinate to the characteristic landscape.*

Viewing Distance

Viewing distance is important in determining how change is perceived across a landscape. For this analysis, viewing distance is characterized according to three zones:

- Foreground: This zone is usually limited to areas within 300 feet to 0.5 mile (not to exceed 0.5 mile) of the observer, but it must be determined on a case-by-case basis. Generally, detail of landforms is more pronounced when viewed from within the foreground zone.

- Middleground: Alterations in the middleground (0.5 to 4 miles from the observer) are less distinctive. Texture is normally characterized by the masses of trees in stands or uniform tree cover.

- Background: This zone extends from middleground (minimum of 4 miles between the observer and the area being viewed) to infinity. Shape may remain evident beyond 10 miles, especially if it is inconsistent with other landscape forms. Beyond 10 miles, alteration in landscape character becomes obscure.

Built Environment Image Guide

In 2001, the Forest Service adopted the Built Environment Image Guide (BEIG, FS-710) as a way of incorporating "thoughtful design and management" of the built environment across National Forests and grasslands.[26] The Forest Service defines the built environment as "the administrative and recreation buildings, landscape structures, site furnishings, structures on roads and trails, and signs installed or

[25] Ibid.
[26] USDA Forest Service, 2001

operated by the Forest Service, its cooperators, and permitees.[27] Per the BEIG, the cultural context of the built environment influences appropriate building designs, and the amount and type of surrounding development requires careful consideration. For example, "The size, style, and materials chosen for a regional [Forest Service] office in a large city would be much different than those for a ranger station in a small town."[28]

The BEIG provides guidance for improving the image, sustainability, and overall quality of Forest Service facilities consistent with the Agency's role as a leader in land stewardship. To achieve this aim, the BEIG:[29]

- Describes an approach to designing recreation and administrative facilities that highlights key elements of the Agency's national identity and image.
- Describes a process to "fit" facilities within the context of their ecological, physical and cultural settings.
- Establishes architectural character types for National Forests and grasslands across eight provinces, nationwide.
- Incorporates the principles of sustainability as an integral part of architectural character.
- Illustrates the role everyone plays in maintaining a quality facility.

To ensure sensitive responses to the contexts of ecology and culture, the BEIG addresses eight geographic areas known as provinces. The LTBMU is within the North Pacific Province, which includes northern California, northwestern Oregon and Washington, and the coastal region of Alaska. The regional architectural style is referred to as "Cascadian."

AFFECTED ENVIRONMENT

Heavenly is located on the south shore of Lake Tahoe in the Sierra Nevada Mountain Range. Lake Tahoe is the largest high alpine lake in the United States (22 miles long by 12 miles wide) and is renowned for its clear waters. Mountain peaks surrounding the lake reach from lake level (6,225 feet above sea level) to over 10,000 feet in elevation.

The management emphasis of NFS lands within the Heavenly Valley Management Area, is on alpine skiing.[30] The development of trails, lifts, infrastructure, and skier facilities has occurred on NFS lands at Heavenly since the ski area's inception in 1955. Almost six decades later, Heavenly offers roughly 4,800

[27] Ibid. p. ii
[28] Ibid. p. 5
[29] Ibid. p. 2
[30] USDA Forest Service, 1988a, p. IV-106

skiable acres of terrain (composed of 94 trails as well as chutes, bowls and glades) across its 7,200-acre SUP area and private lands. Heavenly's terrain network is currently serviced by 29 lifts and accessed through four base areas. Six on-mountain guest service facilities (of varying sizes and functions) are located across the SUP area. In the off-season, a network of mountain roads provides access throughout the SUP area for maintenance and operational needs.

The topography of the SUP area is comprised of steep slopes, large open bowls, basins, glades, and chutes. In California, Heavenly's lift and trail networks are readily visible from South Lake Tahoe (foreground and middleground views) as well as from points throughout the Lake Tahoe basin (middleground and background views). From Nevada (Highway 395) some portions of Heavenly's high-elevation trails and lift lines can be perceived in the background view.

Regarding the visual quality of the Heavenly SUP area, the 1988 Forest Plan notes:[31]

> *Ski trails are the most significant visual man-made alteration of the national forest landscape at Lake Tahoe. Modest attempts to soften the effects with feathered tree removal along the edges of cleared ski trails has not successfully reduced the visual impact.*
>
> *Recent ski run clearing techniques with over-the-snow logging and spot blasting of rocks promises to be less disturbing to the landscape.*

In summary, Heavenly has evolved into a world-class, concentrated recreational venue over the past six decades. Developed recreation in the midst of an outstanding and unique natural environment contributes heavily to the sense of place.

Because all of the buildings throughout Heavenly's SUP area pre-date the Forest Service's adoption of the BEIG, most of them do not meet its intent. Nonetheless, Heavenly's existing lift, trail and infrastructural networks are operating in compliance with 1988 Forest Plan direction for visual quality; it either meets or exceeds the VQO of *Partial Retention*.

Scenic Characteristics of Areas Proposed for Alteration

The following discussions provide specific detail on portions of the SUP area that are proposed to be modified through the Proposed Action: the top of the Gondola area, Galaxy Pod, and Snow Beach.

Top of the Gondola

The Gondola is Heavenly's predominant destination access point—roughly 40 percent of skiers and riders, and all of summer guests, access the mountain from the Gondola. Thus, the top of the Gondola is a

[31] Ibid. p. IV-105

focal point for summer and winter activities, and as such has been highly developed. It hosts the top terminal of the Gondola which is the largest building in the area; it is constructed of brown painted wood which fits into the natural surroundings. Two yurts (one green and one white) are also located in the top of the Gondola area supporting Adventure Peak (snowtubing and the zipline) and the bulk of Heavenly's teaching terrain. Restrooms are located in a brown modular building near the tubing and teaching terrain. The Umbrella Bar provides limited food and beverage service in an octagonal shaped building with floor-to ceiling windows. The Umbrella Bar is dark green in color, which helps it to blend into the natural and man-made surroundings of the Top of the Gondola. Finally, two lift terminals are located within the area, the Tamarack Express and Big Easy lift. The top of the Gondola cannot be seen from beyond the immediate foreground view.

Galaxy Pod

The northeast-oriented Galaxy Pod is on the Nevada side of the resort and is out-of-Basin. It consists of two intermediate trails—*Perimeter* (U1) and *Galaxy* (U2)—which were constructed using traditional methods (i.e., grading) that total roughly 23.6 acres. These trails are serviced by a fixed-grip double chairlift, approximately 5,440 feet in length. There is no snowmaking in the Galaxy Pod.

Portions of *Perimeter* and *Galaxy* can be seen from the background view, on Highway 395 in Nevada.

Snow Beach

Snow Beach is located at the base of the Powderbowl Express and serves visitors using *Patsy's* trail as well as those returning from upper portions of the California side of the resort. The roughly 790-square foot, square building was originally designed and used for Heavenly's snowmaking system. It was retrofitted to serve as a guest services facility, and now serves a limited function, with 80 outdoor seats, food service and restrooms. The existing Snow Beach structure is constructed of wood siding (painted blue) with a peaked roof line. Snow Beach is only visible from within the foreground view to guests in the immediate vicinity.

Considering the small size and shape of the Snow Beach facility, it is considered to be consistent with the intent of the BEIG.

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Selection of the No Action Alternative would not lead to any direct or indirect effects to the scenic environment throughout the Heavenly SUP area.

Some of the approved Phase I MPA 07 projects have not been implemented to date. Because impacts related to these Phase I MPA 07 projects were analyzed site specifically and approved for

implementation, they require no further analysis and may be implemented even if the No Action Alternative is selected. Approved Phase I MPA 07 projects that have not been implemented are identified in the Introduction to Chapter 3. The Powderbowl Lodge will need to be designed in conformance with the BEIG.

Alternative 2 – Proposed Action

The aesthetic impacts of the proposed changes within the project area were considered in relation to the overall existing development/recreational theme of the resort and the VQO.

For all proposed projects, short-term impacts to the aesthetic environment would result from ground disturbing activities (e.g., lodge construction, ESRHR prescription on the *California Trail*, construction of the four proposed trails in the Galaxy Pod, grading related to relocation of the Umbrella Bar, and location and installation of underground snowmaking lines). However, these short-term impacts would be minimized through prompt revegetation of disturbed areas, as well as other Project Design Features identified in Table 2-3.

Visual resources within the project areas would continue to comply with the VQO of *Partial Retention*.

Gondola Lodge

The Gondola Lodge would be a single-story structure (maximum height not to exceed 39 feet), with an approximately 14,750-square foot footprint and a 4,320-square foot (24 feet by 180 feet) concrete patio. This analysis only considers the massing (i.e., height and footprint) of this proposed facility, as well as preliminary design elements provided by Heavenly. The Gondola Lodge would not be visible outside of the immediate foreground view.

The Gondola Lodge architecture is intended to borrow from existing buildings that have been constructed since the MPA 07 was accepted, including materials, colors, and roof slopes. This is intended to help visually unify and tie together on-mountain facilities throughout the SUP area.

The 3:12 roof slope of the Gondola Lodge would match the existing roof slope used on the buildings on the gondola mid-station. It would be made of standing seam metal colored dark green rather than composition asphalt shingles. However, the 3:12 roof slope is inconsistent with the BEIG's direction to utilize steep roofs (from 6:12 to 12:12). In addition, per the BEIG, the shed roof styles should dominate the architectural composition within alpine environments of the North Pacific design province; the Gondola Lodge likely would not accomplish this.

In order for the Lodge to be constructed in this location, its back side would need to be set into an adjacent hillside and the existing Magic Carpet lift would need to be relocated. While this would likely have the affect of reducing the overall prominence of the building, the resulting retained slope behind the

western side of the lodge would be approximately 33 feet high and 75 feet long. The slope and retaining wall would be covered in snow during most of the ski season. Development of the Gondola Lodge and retaining wall and relocation of the Magic Carpet lift would result in 2.03 acres of grading. No overstory vegetation removal would be required within the lodge disturbance footprint; however, 0.06 acre of tree removal would occur at the site of the relocated Magic Carpet. Grading would be a temporary impact to scenery resources and would be promptly revegetated. As per Table 2-3, the retaining wall would need to be constructed from natural looking materials. The bulk of the retaining wall would be visually screened from visitors throughout the year by the lodge structure, and that this feature would not represent a deviation from what is expected or acceptable in a developed winter recreation area such as Heavenly.

Snow Beach

With construction of the Gondola Lodge, the Umbrella Bar food and beverage seating at the Top of the Gondola would become obsolete, and is proposed to be relocated to Snow Beach in order to supplement existing guest service facilities that are inadequate for the demand placed upon them. No overstory vegetation removal would be required for the relocation of the Umbrella Bar. Approximately 0.02 acre of grading would be a temporary impact to scenery resources, and would be promptly revegetated.

As previously discussed, Snow Beach is only visible from within the foreground view, primarily to guests who are descending to the California side of the resort, using the *Groove* terrain park, or on teaching/Intermediate terrain on the Patsy's or Powderbowl lifts. Relocating the Umbrella Bar to Snow Beach is consistent with the overall MPA 07 theme for this area (i.e., incorporating "the fun and excitement of California snowboarding and surfing"), but differs in that it would provide indoor seating instead of an open air tent shelter.[32]

Relocation of the Umbrella Bar to Snow Beach would result in a collection of building types that do not relate to each other architecturally. The Umbrella Bar's shallow roof pitch and vinyl material would not complement the existing structure. Therefore, should the Umbrella Bar be placed adjacent to the existing rectangular, blue Snow Beach building, it would be difficult to make the two facilities aesthetically congruent. However, as noted previously, per the BEIG, the cultural context of the built environment (in this case, the developed ski area) influences appropriate building designs, and the amount and type of surrounding development requires careful consideration.

The Proposed Action can be implemented to be consistent with the VQO of *Partial Retention*.

California Trail ESRHR Prescription

Due to the intent of the ESRHR prescription, incorporating it on approximately 4.2 acres of the lower portion of *California Trail* would not impact the aesthetic quality of the area.

[32] Heavenly Mountain Resort, 2007 p. 4-44

Galaxy Pod

Replacement of the Galaxy lift and trail additions within the Galaxy pod would be consistent with the VQO of *Partial Retention* that is assigned to the Heavenly SUP area.

Construction of proposed trails U3, U4, 14 and 15 would entail approximately 23.6 acres of overstory vegetation removal. Additionally, upgrading the lift to high-speed technology would require widening the lift corridor from 30 to 33 feet, resulting in approximately 0.4 acre of overstory tree removal. As such, the Galaxy pod projects would represent an incremental addition to a developed recreation area with a management emphasis on "Alpine skiing." Therefore, the Galaxy pod projects are consistent with the Heavenly Valley Management Area. As per Table 2-3, trail edges should be constructed to be non-linear, and selective removal of different-aged trees would help to soften edges. However, vegetation and cultural resources must be taken into consideration with aesthetic quality as any approved trails are constructed.

Due to the topography of Heavenly, proposed trails 14 and 15 would be visible in the middle and background view from outside the ski area in Nevada (as shown in Figure 3.10-9 of the 2007 EIR/EIS/EIS). Construction of these trails would represent an incremental change to the developed environment that is visible from outside the Heavenly SUP area. The trails were designed with bends and curves to avoid straight lines in the middle or background view. Developments would be obvious in the foreground, to visitors using the pod, due to the large amount of vegetation removal, but trail development would be consistent with what a visitor to the ski resort would expect at a ski area.

CUMULATIVE EFFECTS

The Introduction to Chapter 3 identifies past, present and reasonably-foreseeable future projects within the Heavenly SUP area that have potential to affect the aesthetic environment. All past projects underwent site-specific environmental analysis compared to the baseline aesthetic conditions prior to their approval. Future projects, including the Phase II and III projects in the MPA 07 which have been analyzed programmatically, will necessitate site specific analysis before they can be approved or implemented; the potential effects of which will be compared against the baseline aesthetic conditions.

A summary of the cumulative aesthetic impacts of full build-out of the MPA 07 includes:

- A total of 37 lifts (23 aerial lifts and 14 surface lifts) as compared to the existing 29 lifts.
- A total of ten guest service facilities located across the ski area (NFS and private lands), compared to the existing eight facilities.
- A developed terrain network consisting of roughly 813 acres of developed trails (compared to the exiting 662 acres). This includes the addition of an entirely new trail pod—Wells Fargo.

It is important to note that the Management Emphasis of the Heavenly SUP area is on Alpine skiing, which is accompanied by a certain, unavoidable degree modification to the visual environment. However, this is not to imply that impacts cannot be lessened or mitigated. Project Design Features, best management practices, and adherence to the BEIG can minimize or avoid many aesthetic impacts. These practices have been, and will continue to be, applied to proposed projects undergoing site-specific environmental analysis.

This analysis indicates that the 2010 Capital Projects can be implemented in a manner that is consistent with Forest Plan and Management Area direction for the Heavenly SUP area. All future projects will undergo site-specific environmental analysis compared to the baseline aesthetic conditions.

C. CULTURAL, ARCHAEOLOGICAL, AND HERITAGE RESOURCES

SCOPE OF THE ANALYSIS

This cultural resource assessment is mandated by the National Historic Preservation Act of 1966 (NHPA). Section 106 of the NHPA requires that federal agencies take into account the effects of a federal undertaking on any cultural resource that is included in or eligible for inclusion in the National Register of Historic Places (NRHP). This cultural resource analysis summarizes a complete 2009 Heritage Resource Inventory contained in the project file. (Project Record Document 3) The complete inventory will be submitted to the California/Nevada State Historic Preservation Officer (SHPO) by the LTBMU for concurrence with the report findings (summarized below). Cultural resources may refer to sites, areas, buildings, structures, districts, and objects which possess scientific, historic, and/or social values of a cultural group or groups as specified by 36 CFR 296.3.

This assessment is based on archaeological sources that indicate historic and prehistoric utilization of lands within and adjacent to the Heavenly SUP area by hunting based societies in prehistoric times through the 19th century Comstock Era mining boom and timber extraction. Cultural surveys were conducted within and adjacent to proposed project locations throughout Heavenly's SUP area, known as the "areas of potential effect" (APE). The APE for this cultural analysis is identified on Figure 1 as "project locations" and "relocated Umbrella Bar," and, due to the Heavenly SUP area's unique location, extends into both California and Nevada. Projects at the top of the gondola, *California Trail*, and Snow Beach are located in California, while the Galaxy pod is in Nevada.

NRHP eligibility is evaluated in terms of the integrity of the resource; its association with significant persons, events, or patterns in history or prehistory; its engineering, artistic, or architectural values; or its information potentially relative to important research questions in history or prehistory.[33] The significance of NRHP eligibility of cultural resources is determined by the LTBMU Archaeologist in consultation with the SHPO.

AFFECTED ENVIRONMENT

Files maintained by the LTBMU and the Nevada and California SHPOs were consulted prior to the initiation of fieldwork related to this analysis. Research disclosed that a number of prior archaeological studies have been conducted within the project APE, and several heritage resources have been previously recorded. Previous projects in the legal sections encompassing proposed project areas include ski area development and segments of the Tahoe Rim Trail.

[33] 36 CFR Section 60.4

Cultural Resource Sites and Isolated Finds Inventory Methodology

Between October 26th and 29th, 2009, a surface archaeological reconnaissance was conducted by LTBMU archaeologists and a consulting archeologist, in compliance with the Heavenly Valley Ski Resort Programmatic Agreement.[34] The APE near the top terminal of the Gondola and on *California Trail* was previously surveyed using a mixed reconnaissance strategy. The Snow Beach APE was also subject to prior surveys. No heritage resources were encountered at either the top of the Gondola or Snow Beach, and therefore no additional surveys were conducted within either APE at these locations.

Within the Galaxy pod APE, field studies specific to this analysis included:

(a) additional archaeological reconnaissance,

(b) updates of existing archaeological site records, and

(c) site boundary flagging.

A majority of the four proposed new ski trails in the Galaxy pod, as well as existing trails (*Perimeter* and *Galaxy*) where snowmaking is proposed, have been previously covered using the Surface-30 survey protocol. New surveys were completed in October 2009 in sections of the Galaxy pod APE. Small areas near the top and bottom terminals of the Galaxy Lift are characterized by greater than 30 percent slope and extremely disturbed ground; warranting no further surveys.

The project terrain is largely characterized by a pine and fir forest growing on moderate to steep slopes that are covered by a veneer of decomposed granite and punctuated by boulder knobs. Special coverage was given to exposed boulders, sensitive areas along the stream corridor and areas in proximity to known archaeological sites. Approximately 50 percent of the overall project ground surface is obscured by brush, duff and deadfall, which hindered survey visibility.

Cultural Survey Results

Site record updates were completed on nine previously registered sites (2005 and 2006) including rural wood camps and a cooking hearth (a V-flume was also identified but was ineligible for the NRHP due to its degraded condition). Two wood haul roads were recorded, extending segments of recorded haul roads; six isolates including Chinese ceramics, abandoned cordwood, a tree snag with axe markings and a shovel were identified. Direct observations included: intactness of the structural wood elements, the spatial layout of the site's components and cultural deposit integrity. Artifacts were relocated and the relative intactness of features was assessed, as well as the overall spatial layout of the site's components. Potential on-going impacts due to natural environmental variables (weathering, freeze-thawing, etc.) were also considered. In

[34] USFS, 1999

order to track possible changes, new photographs were taken as part of an on-going monitoring study by the LTBMU.

All archaeological sites inventoried within the project APE are related to the extractive industry associated with Comstock era timber harvest activities. The most visible archaeological remains represent domestic activity areas used by laborers (probably Chinese) who cut and transported wood along the South Fork of Daggett Creek from 1868 to 1880. Weathered, high-cut stumps are ubiquitous, and these, along with historic road grade segments and a V-flume remnant, exist as reminders of the area's historic setting in the form of an industrial landscape and associated transportation networks. The two new segments of haul roads identified in this survey were added to a historic haul road system previously identified in 2005. In regards to the six isolates, as isolated finds, all of their potentially significant information has been recovered with the completion of the October 2009 heritage study and should not further constrain projects in the area.

Past ski area activities including construction of the Galaxy Lift and *Galaxy Trail* have resulted in disturbance to one of the wood haul roads and a rural wood camp. Additional activities and disturbances in proximity to archaeological sites located within the project APE are attributed to construction and use of the Tahoe Rim Trail.

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Because no ground disturbance is proposed as part of the No Action Alternative, there is no potential to affect the historic sites within the APE as a result of the No Action Alternative.

Note that some of the approved Phase I MPA 07 projects have not been implemented to date. Because these projects were analyzed site specifically and approved for implementation by the LTBMU Forest Supervisor, they require no further analysis and may be implemented even if the No Action Alternative is selected. Approved Phase I MPA 07 that have not been implemented to date include:

- North Bowl Lift replacement
- snowmaking on *Sky Trail*
- Powderbowl Lodge
- Hiking/Nordic/snowshoe trails
- Skier ramp at the Gondola top terminal

Alternative 2 – The Proposed Action

The Cultural resource finding for projects included in the Proposed Action is *No Historic Properties Affected*. No cultural resources were identified within the proposed Gondola Lodge and *California Trail* APE, nor the relocated Umbrella Bar at Snow Beach APE. Proposed trail construction and snowmaking activities in the Galaxy pod APE are in close proximity to several identified archaeological sites. To avoid any potential project impacts to cultural resources in the Galaxy pod APE, proposed trail alignments have been modified from those included in the MPA 07, project design features have been incorporated into the Proposed Action (refer to Table 2-3), and monitoring will take place before, during and after the construction process to assess the sties' condition. The cultural resources specialist report will be submitted to Nevada SHPO for review and concurrence.

Trails *U3, U4, 14* and *15* have been slightly re-aligned from the conceptual alignment contained in the MPA 07 in order to avoid known cultural resources. Because the trails avoid known cultural resource, the ESRHR Prescription on each of the proposed trails is not anticipated to impact cultural resources. Belowground snowmaking is proposed on these new trails as well as on existing trails *Perimeter (U1)* and *Galaxy (U2)*. New snowmaking pipelines would be buried up to four feet deep along the edges of all proposed trails within the Galaxy pod APE. To avoid direct impacts to segments of the historic wood haul road that crosses proposed trails *14* and *U3*, snowmaking lines would need to be laid in a horizontal boring beneath the historic grades, thereby eliminating any disturbance to the surface grade. Additional project design features established to minimize impacts to cultural resources (identified in detail in Table 2-3) include:

- Identify all historic properties with the construction foreman prior to construction and establishing sensitive zones on project maps approved by the LTBMU Heritage Resource Program Manager.[35] During lift or trail construction within 100 feet (30 meters) of a historic property, an archaeological monitor approved by the Forest Service will be on site to ensure protection measures are implemented and effective.

- Over-the-snow logging would be required in specific areas to avoid impacts to cultural resources. Stumps will be removed when the ground is clear of snow and the archaeological sites are exposed, all work in proximity to sites will be carried out by hand and vehicles will be prohibited from entering the site buffer zone approved by the Forest Service.

- Post-construction monitoring of all properties identified on the construction plans as "protection areas" occur a second time after the completion of the construction activity. Barriers would be placed around sites with high-profiles (as identified by the Heritage Resource Program Manager) during the winter season in order to protect them from skier/rider encroachment or disturbance.

[35] The locations of cultural resources would remain confidential to protect their integrity.

If any previously unidentified archaeological remains are discovered or exposed during project operations all project related work will cease and LTBMU heritage resources personnel will be notified immediately.

CUMULATIVE EFFECTS

As discussed under Direct and Indirect Environmental Consequences, there would be no impacts to NRHP-eligible cultural resources from implementation of the Proposed Action; therefore, by definition, no cumulative effects would occur or require further analysis.

D. WILDLIFE

SCOPE OF THE ANALYSIS

This analysis of wildlife resources is tiered to the Sierra Nevada Forest Plan, as amended, and incorporates by reference the 2007 EIR/EIS/EIS.[36] The wildlife and vegetation sections of that document describe the affected environment of Heavenly's SUP boundary and detail the background, setting and regulatory environment. The following is a summary of wildlife analyses that were conducted specifically for the 2010 Capital Projects (Project Record Documents 2 and 4).

AFFECTED ENVIRONMENT

The project area consists of the following four locations throughout the SUP area: 1) Snow Beach; 2) Top of the Gondola area; 3) *California Trail*; and 4) the Galaxy Pod. The project area encompasses approximately 50 acres and ranges in elevation between 7,800 and 9,700 feet.

Top of Gondola Area

The Top of the Gondola area includes two projects for implementation; the Gondola Lodge and the relocation of the Magic Carpet Conveyor Lift. The Top of Gondola Area is surrounded by lodgepole pine and red fir forest. Ski area management and recreation activities are present at the Top of the Gondola during both summer and winter months, as it is the main access point to the resort. The 2007 EIR/EIS/EIS identified suitable nesting habitat for northern goshawk in the forested areas surrounding the project sites. The proposed Gondola Lodge location is set into the hillside that contains limited trees, sparse groundcover (primarily *arctostaphylos nevadensis*) and numerous boulders. The relocation of the Magic Carpet Conveyor Lift would occur in a relatively open area with well-spaced trees and low canopy cover.

California Trail

California Trail is barren land that was cleared of all trees and shrubs during construction in the late 1960s. Existing effective cover on *California Trail* consists of large boulders, downed logs, bare ground and minor ground cover. The project area does not contain suitable habitat for sensitive wildlife species.

Snow Beach

The Snow Beach structure within a presently disturbed area, and has been utilized as an outdoor seating area and as a ski trail. No suitable wildlife habitat exists within the disturbance area, as the location is an existing graded trail and roadway.

Galaxy Pod

A mix of red fir forest, subalpine conifer, montane chaparral, and barren habitats compose the Galaxy Pod project area. Subalpine conifer and red fir forest dominate the northerly aspect slopes, while the south and

[36] USDA Forest Service, 2007

east facing slopes contain a higher degree of montane chaparral. The South Fork of Daggett Creek runs from East Peak Lake west and down slope through the Galaxy Pod. Minimal montane riparian vegetation is present along the creek banks within the project area. A mitigation wetland area, constructed in the late 1980's, is present along Daggett Creek, below the Galaxy Lift line at lift tower 12. The wetland is composed almost exclusively of grasses and provides minimal habitat to wildlife species that utilize riparian zones.

SPECIAL STATUS WILDLIFE SPECIES

Listed and candidate wildlife species for this project consist of those identified by the U.S. Fish and Wildlife Service (USFWS) and Forest Service as potentially present on the LTBMU. These species are listed in Table 3D-1 below, followed by descriptions of these species and the associated surveys.

Table 3D-1:
Threatened, Endangered, Candidate and Sensitive Wildlife Species Potentially Present Within the Heavenly SUP Area

Wildlife Species	Legal Status	Known to Occur in Project Area	Suitable Habitat in project area	Habitat not considered suitable
REPTILES/AMPHIBIANS				
Mountain yellow-legged frog (*Rana muscosa)*	S, C	N	N	No waters suitable for breeding in or near project area
Northern leopard frog (*Rana pipiens*)	S	N	N	Project area above elevation of known local populations.
Yosemite toad (*Bufo canorus*)	C	N	N	Project area north of known distribution
BIRDS				
Bald Eagle (*Haliaeetus leucocephalus*)	S, D	Y	Y	
California Spotted Owl (*Strix occidentalis occidentalis*)	S,SC	N	Y	
Great Gray Owl (*Strix nebulosa*)	S	N	N	No suitable habitat exists within the project area.
Northern Goshawk (*Accipiter gentiles*)	S	Y	Y	
Willow Flycatcher (*Empidonax traillii adastus*)	S	N	N	No suitable willow habitat within the project area
AQUATIC INVERTEBRATES				
Great Basin rams-horn (*Helisoma newberryi newberryi*)	S	N	N	No suitable habitat for aquatic snail, which includes large lacks and slow rivers with a muddy substrate.

Table 3D-1:
Threatened, Endangered, Candidate and Sensitive Wildlife Species Potentially Present Within the Heavenly SUP Area

Wildlife Species	Legal Status	Known to Occur in Project Area	Suitable Habitat in project area	Habitat not considered suitable
MAMMALS				
Sierra Nevada red fox (*Vulpes vulpes necator*)	S, SC	N	N	No records of detections within the Lake Tahoe Basin, thought to be extirpated.
American marten (*Martes americana*)	S, SC	Y	Y	
Fisher (*Martes pennanti*)	C	N	N	Habitat confined to lower elevations where snow pack is reduced or absent.
California wolverine (*Gulo gulo luteus*)	S,	N	Y	
Townsend's big-eared bat (Corynorhinus townsendii)	S, SC	N	N	No caves or mines of suitable depth in project area. All abandoned buildings in project area subject to frequent disturbance.
FISH				
Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*)	T	Y	N	South Fork Daggett Creek does not contain suitable habitat.
Lahontan Lake tui chub (*Gila bicolor pectinifer*)	S	N	N	Project area does not contain suitable lentic habitat

Notes (List revised in July 2009):
No species in the Lake Tahoe Basin are currently listed as "Endangered" by the USFWS under the ESA.
T = USFWS listed as "Threatened" under the ESA
C = USFWS "Candidate species" for listing as threatened or endangered under the ESA
SC = USFWS "Species of Concern"
D = USFWS de-listed, species will be monitored for 5 years
S = USFS LTBMU Sensitive Species, Regional Forester's Sensitive Species List, Amended May 2003

Management Indicator Species

Project level effects on Management Indicator Species (MIS) habitat are evaluated and disclosed below. The impacts on MIS habitat are related to a bioregional habitat and population scale. Table 3-D2 below outlines the selection of MIS for Project-Level habitat analysis for the Heavenly 2010 Capital Projects.

Table 3-D2:
Selection of MIS for Project Level Habitat Analysis for the Heavenly 2010 Capital Projects

Habitat or Ecosystem Component	CWHR Type(s) defining the habitat or ecosystem component[1]	Sierra Nevada Forests Management Indicator Species	Project Analysis Category[2]
Riverine & Lacustrine	Lacustrine (LAC) and riverine (RIV)	Aquatic macroinvertebrates	1
Riparian	Montane riparian (MRI), valley foothill riparian (VRI)	Yellow warbler Dendroica petechia	2
Wet Meadow	Wet meadow (WTM), freshwater emergent wetland (FEW)	Pacific tree frog Pseudacris regilla	1
Early Seral Coniferous Forest	Ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree sizes 1, 2, and 3, all canopy closures	Mountain quail Oreortyx pictus	3
Mid Seral Coniferous Forest	Ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 4, all canopy closures	Mountain quail Oreortyx pictus	3
Late Seral Open Canopy Coniferous Forest	Ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 5, canopy closures S and P	Sooty (blue) grouse Dendragapus obscurus	2
Late Seral Closed Canopy Coniferous Forest	Ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), tree size 5 (canopy closures M and D), and tree size 6.	California spotted owl Strix occidentalis occidentalis	2
		American marten Martes americana	
		Northern flying squirrel Glaucomys sabrinus	
Snags in Green Forest	Medium and large snags in green forest	Hairy woodpecker Picoides villosus	3
Snags in Burned Forest	Medium and large snags in burned forest (stand-replacing fire)	Black-backed woodpecker Picoides arcticus	1

[1] All CWHR size classes and canopy closures are included unless otherwise specified; **dbh** = diameter at breast height; **Canopy Closure classifications:** S=Sparse Cover (10–24% canopy closure); P= Open cover (25–39% canopy closure); M= Moderate cover (40–59% canopy closure); D= Dense cover (60–100% canopy closure); **Tree size classes:** 1 (Seedling)(<1" dbh); 2 (Sapling)(1"–5.9" dbh); 3 (Pole)(6"–10.9" dbh); 4 (Small tree)(11"–23.9" dbh); 5 (Medium/Large tree)(≥24" dbh); 6 (Multi-layered Tree) [In PPN and SMC] (Mayer and Laudenslayer 1988).
[2] **Category 1:** MIS whose habitat is not in or adjacent to the project area and would not be affected by the project. **Category 2:** MIS whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project. **Category 3:** MIS whose habitat would be either directly or indirectly affected by the project.

Based on Table 3-D2 above, and the habitat that is present within the project area, the MIS species that will be evaluated in this section are Mountain quail (*Oreortyx pictus*) and hairy woodpecker (*Picoides villosus*).

Threatened and Endangered Species

Lahontan Cutthroat Trout

The Lahontan cutthroat trout is federally listed as threatened. Lahontan cutthroat trout are typically found in the headwater reaches of streams on the eastern slope of the Sierra Nevada mountain range. Individual creeks known to provide habitat for Lahontan cutthroat trout vary considerably in water temperature and habitat condition. The gradient of occupied streams ranges from a high of 4 percent to a low of 1 percent, while streambed character varies from steep rocky, well-armored substrates to relatively flat meadow-like reaches. Lahontan cutthroat trout, like other salmonids, require gravel riffles for spawning. A base flow 50 percent or greater than the average annual daily flow is considered excellent for maintaining quality habitat. A base flow of 25 to 50 percent is adequate for maintaining habitat, while a base flow of less than 25 percent is considered to support poor habitat.

Many populations of Lahontan cutthroat trout have been extirpated from the Lake Tahoe Region by historical land management practices such as logging and road construction, which have degraded or adversely impacted spawning and rearing habitat. Overfishing and the introduction of non-native salmonids (brown, rainbow, lake and brook trout) were also major factors in the extirpation of Lahontan cutthroat trout from the Lake Tahoe Region.[37] Lahontan cutthroat trout evolved in the absence of other trout species and consequently do not compete effectively with other salmonids.

Within the Lake Tahoe Region, a breeding population of Lahontan cutthroat trout has been re-established in the headwaters of the Truckee River, including Meiss Lake. Additionally, a stocked population of Lahontan cutthroat trout occurs in Round Lake on the upper reaches of the Truckee River. Barriers separate Lahontan cutthroat trout populations in the Upper Truckee River and Meiss Lake from trout species in the lower reaches of the Upper Truckee River to ensure the continued viability of the Lahontan cutthroat trout.

Lahontan Cutthroat Trout Surveys

According to the LTBMU's "Fisheries Resource Analysis Report for Heavenly Valley Ski Area," seven Lahontan cutthroat trout were found in the mid-reaches of Heavenly Valley Creek in 1990.[38] Figure 4.9-2 found in 1995 Draft EIR/EIS/EIS illustrates the stream reaches surveyed by the LTBMU and identifies those reaches in which Lahontan cutthroat trout were found. In summary, one juvenile trout was found in a boulder-formed lateral scour pool in the third stream reach; two adults were found in a 4-foot deep step pool in the fourth reach; and three adults and one juvenile were found in a plunge pool in the fifth reach.

The Lahontan cutthroat trout found in Heavenly Valley Creek were believed to be the progeny or surviving adults of a Lahontan cutthroat trout population stocked upstream in the Sky Meadow Reservoir

[37] USDA Forest Service, 1992. Personal Communication – Reiner
[38] USDA Forest Service, 1990

in 1980.[39] These fish were thought to have been washed out of the reservoir during the high flows of 1983. The presence of two juvenile fish in 1990 indicates that reproduction has occurred in the creek. However, the small size of the existing population (seven individuals) indicates that the value of Heavenly Valley Creek as a significant fisheries resource may be limited. The three reaches of Heavenly Valley Creek (3, 4 and 5) in which fish were detected in 1990 were resurveyed in 2005 by Forest Service personnel, along with the 105 meters of creek directly above Sky Meadows reservoir. Surveys of reaches 3, 4 and 5 by snorkel yielded no detections. The habitat in these reaches is currently considered unsuitable for foraging or spawning because of sedimentation that resulted from a 1995 culvert failure within the Heavenly SUP area. An Electro-shock survey of the creek reach directly above the Sky Meadows reservoir also failed to detect any trout. No suitable habitat exists within the South Fork of Daggett Creek in the vicinity of the Galaxy pod.

Candidate species

Pacific Fisher

In California, Pacific fisher detection most often occurs at lower elevations than American marten. These elevations are typically between 2,000 and 5,000 feet in elevation in the North Coast region and between 4,000 and 8,000 feet in elevation in the southern Sierra Nevada mountain range. Based on Freel's literature review, preferred habitat for the fisher is characterized by dense (60 to 100 percent canopy), multi-storied, multi-species late seral stage coniferous forest with a high number of large snags and downed logs.[40] Preferred habitat types in the Sierra Nevada include montane hardwood-conifer, mixed conifer, montane riparian, Jeffrey pine, ponderosa pine, lodgepole pine, subalpine conifer, aspen, eastside pine, and possibly red fir. Habitat areas also include areas in close proximity to dense riparian corridors, saddles between major drainages, or other landscape linkage patterns that are used as dispersal corridors. An interspersion of small (<2 acres) openings with good ground cover is required for foraging.

Although studies have indicated that fishers use greater percentages of early to mid-seral stage forest stands for foraging in summer months, they still appear to need and utilize the mature, old growth stands for denning, especially in areas with high snowfall.[41] Heavily used roads are not desirable, as they are associated with habitat disruption and animal mortality. However, one- and two-lane forest roads with moderate levels of traffic are not believed to limit fisher movements.

The California Department of Fish and Game Natural Diversity Data Base (CNDDB) cites one occurrence of fisher in 1967. This occurrence was recorded approximately 4 miles south of Meyers in the Eldorado National Forest. No recent sightings of fisher were found in the LTBMU Incidental Sightings Data Base. The database included information containing Heavenly's SUP boundary found within the

[39] USDA Forest Service, 1992. Personal Communication – Perrochet
[40] Freel, 1991
[41] Ibid.

Freel Peak and/or or Minden USGS 7.5" topographic quadrangles maps, South Lake Tahoe. Available data suggest that the Pacific fisher has been extirpated from the central and northern Sierra Nevada.[42]

Pacific fishers were not detected during the winter or summer forest carnivore surveys conducted within the Heavenly SUP boundary during the 2002 surveys and/or ongoing annual studies. Although potentially suitable habitat exists within the project area, considering the lack of recent sightings in the vicinity of the project area, fishers are not expected to occur in the project area. Data from other studies conducted within California also suggest that Pacific fisher has been extirpated from the central and northern Sierra Nevada.[43]

Mountain Yellow-legged Frog

The mountain yellow-legged frog is a Sensitive species on all Sierra Province National Forests in the Pacific Southwest Region and a USFWS Candidate species. There is no habitat for mountain yellow-legged frog within the Heavenly SUP area.

Historic accounts of the mountain yellow-legged frog Lake Tahoe Basin include observations at Grouse Lake 8/1/1974, Tamarack Lake 9/14/1975, Secret Harbor Creek 4/20/1994, and 5.5 miles north of Incline Village 7/10/1932.[44] A population of mountain yellow-legged frogs currently exists at Hell Hole (as of 7/2003). None of these historic accounts are within the Heavenly SUP boundary.

Yosemite Toad

The Yosemite toad is a USFWS candidate species. This species ranges within the Sierra Nevada from Eldorado County to Fresno County at elevations between 6,600 and 11,000 feet in elevation. Yosemite toad is restricted to wet meadows and surrounding areas. There have been no verified records of Yosemite toad within the Heavenly SUP boundary.

Forest Service Sensitive Species

Bald Eagle

The bald eagle is a delisted species. The bald eagle is known to winter in the LTBMU, where it occurs in association with large bodies of water such as lakes, reservoirs, and river systems that provide a source of forage fish. Wintering habitat in the Lake Tahoe Basin consists of mid-to-late successional stages of montane riparian and mixed conifer forests. Bald eagle habitats are characterized by a canopy closure of less than 40 percent and the presence of standing dead trees or snags.[45]

[42] Zielinski et al., 2005
[43] Laymanand and Halterman, 1993; Chow, L.S., 1993
[44] USDA Forest Service, 1998. Personal Communication – Schlesinger
[45] USDA Forest Service, 1988a

The wintering population of bald eagles in the LTBMU is estimated at four to ten birds. The number of bald eagles that winter in the Lake Tahoe Basin each year is related to the success of the basin's Kokanee salmon spawning runs and to the freezing of lakes and reservoirs located elsewhere in the Sierra Nevada, which precludes eagles from foraging at these water bodies. The primary areas used by wintering bald eagles in the LTBMU include Taylor Creek, Emerald Bay, and Fallen Leaf Lake. A wintering Bald Eagle management area has been established along the west shore of Lake Tahoe and includes Taylor Creek, Cascade Lake, and Emerald Bay. The eastern boundary of this wintering area along Taylor Creek is located approximately 9 miles northwest of the project site.

Bald eagles have been documented to nest within the Lake Tahoe Basin at Emerald Bay and Marlette Lake. The limiting factor to future nesting in the Lake Tahoe Basin is intensive human disturbance, especially boating and development in feeding areas. The LTBMU has little control over these factors, as most of this activity occurs outside of NFS lands. However, the LTBMU does have the opportunity to maintain potential high quality nesting habitat for the bald eagle on NFS land.[46] Emerald Bay was identified by Golightly et al. as a potential area for establishing bald eagle nesting habitat in the Lake Tahoe Basin.[47] No bald eagle nest(s) are known to occur in the Heavenly SUP boundary.

California Spotted Owl

The range of the California spotted owl (*Strix occidentalis occidentalis*) is considered to include the southern Cascades, the entire Sierra Nevada province of California, all mountainous regions of the southern California province, and the central Coast Ranges at least as far north as Monterey County. In the Sierra Nevada, the major forest types comprising known and potential habitat include mixed conifer, red fir, ponderosa pine/hardwood, eastside pine, and foothill riparian/hardwood forests.[48] Mixed conifer forest is the most abundant forest type and contains most of the known owl sites. Habitats used for nesting typically have greater than 70 percent total canopy cover, except at very high elevations where canopy cover as low as 30 to 40 percent may occur (as in some red fir stands of the Sierra Nevada). Nest stands typically include a mixture of tree sizes with a number of very large, old trees and usually at least two canopy layers. Large snags and an accumulation of downed woody debris are usually present. Foraging habitat is similar in structure and composition, but also comprises more open stands with canopy covers down to 40 percent.

Home range sizes of California spotted owl tend to be smallest in lower elevation hardwood forests, intermediate in size in conifer forests of the central Sierra Nevada, and largest in true fir forests in the northern Sierra Nevada.[49] California spotted owl home ranges in Sierra Nevada mixed conifer forests average 3,400 acres, including about 460 acres in stands with 70 percent or greater canopy cover, and

[46] Ibid.
[47] Freel, 1991
[48] Verner et al., 1992
[49] Ibid.

about 1,990 acres in stands with 40 to 69 percent canopy cover.[50] Generally, the Sierra National Forest owls were found to have a median home range for pairs of approximately 3,000 to 5,000 acres. However, an overall mean home range size of owl pairs during the breeding period in Sierran conifer forests of about 4,200 acres.[51] Owl use areas designated to date by the LTBMU comprise approximately 3,500 to 4,665 acres. Currently there are 20 protected activity centers for California spotted owl on the LTBMU. Radio telemetry studies have not been undertaken for California spotted owls in the LTBMU, so more accurate home range information is currently unavailable. No owl nests are known to occur within the Heavenly SUP boundary.

Northern Goshawk

Northern goshawks (*Accipiter gentilis*) inhabit a broad range of forested communities, including mixed conifer, true fir, montane riparian, Jeffrey pine, ponderosa pine, and lodgepole pine forest. Within California, this species occurs in the Sierra Nevada, Klamath, Cascade, Inyo-White, Siskiyou, and Warner Mountains, and the North Coast Ranges. Goshawks may also possibly inhabit suitable habitats in the Transverse Ranges and other mountainous areas in southern California.[52]

A study conducted in the Lake Tahoe region of the Sierra Nevada found that nest-site areas used by northern goshawks were characterized by high canopy closure, high densities of trees in the >60–100 centimeter (cm) and >100 cm diameter-at-breast-height (dbh) classes, low densities of 5-30 cm dbh trees, and low shrub/sapling and ground cover.[53] Other site factors, including northerly aspects, proximity to water or meadows, forest openings, and low slope angles, have also been associated with nest sites in numerous studies, although these factors vary widely.[54] Snags and logs are considered important components of northern goshawk foraging areas, as they provide habitat for prey populations.[55]

A model of goshawk nest stands developed by Fowler for application on the west slope of the Sierra Nevada, with consideration for east side habitat conditions, indicates that canopy closure of 60 to 100 percent from dominant and co-dominant trees is characteristic of all goshawk nest stands.[56] In Fowler's model, slopes of 0 to 25 percent are identified as optimal. Slopes of 26 to 50 percent are considered suitable, while slopes greater than 50 percent are unsuitable. Aspect is also identified as an important component in nest stand selection, with a north to east aspect considered optimal. North to northwest and east to southeast slopes are considered suitable, while all other aspects are identified as marginal. While the model of Fowler (1988) is most applicable to west slope forests, on the east slope of the Sierra Nevada

[50] Neal et al., 1990
[51] Verner et al., 1992
[52] Zeiner et al., 1990a; USDA Forest Service, 2000
[53] Keane, 1999
[54] USDA Forest Service, 2000
[55] USDA Forest Service, 1988a
[56] Ibid.

northern goshawk have been shown to frequently nest in stands with a mean canopy closure of 29 percent.[57] No northern goshawk nests were found in the Heavenly SUP boundary.

Nesting behavior, including courtship and nest initiation, begins mid-February to early March. The average incubation period is approximately 33 days.[58] The nestling period typically extends from early June through early July, with most young fledged by mid-July. The post-fledging dependency period extends until mid/late August.

Foraging areas around nest sites generally encompass approximately 2,500 acres of forested habitat.[59] Northern goshawks are known to prey on over 50 species of birds and mammals throughout their western range.[60] In the Lake Tahoe region primary prey species include Douglas squirrel (*Tamiasciurus douglasii*), Steller's jay (*Cyanocitta stelleri*), northern flicker (*Colaptes auratus*), and ground squirrel (*Spermophilus spp.*).[61] Other prey species include American robin (*Turdus migratorius*), blue grouse (*Dendragapus obscurus*), other woodpeckers, and other squirrels.

California Wolverine

The California wolverine (*Gulo gulo luteus*), which is generally considered to be a wilderness mammal, occurs in a variety of open terrain habitats at or near timberline. The species is known to have historically occurred in mountainous areas of California from the north coast to the Cascades, and south to the southern Sierra Nevada. The wolverine is a wide-ranging animal and may travel great distances within a home range that encompasses several hundred square miles.[62] Wolverines have a low tolerance for human activity and disturbance and therefore due to the existing recreational use at Heavenly, habitat suitability is limited.

Extensive trapping in the late 19th and early 20th centuries is thought to have severely reduced wolverine populations. The California Cooperative Wolverine Study, led by the Department of Forestry and Resource Management at the University of California, Berkeley is using remote photographic bait stations in areas of historic range and recent reported occurrences to document the current existence of wolverines in California.

One confirmed sighting of a wolverine (photograph and fur samples) occurred in early 2008 on the Tahoe National Forest. In addition, there have been numerous sightings reported by Forest Service employees in recent years. The majority of the sightings have been reported from the southern Plumas National Forest

[57] Hargis et al., 1991
[58] USDA Forest Service, 2000
[59] Austin, 1991 and Hargis et al., 1991
[60] Graham et al., 1994
[61] Keane, 1999
[62] CDFG, 1990

and the northern Tahoe National Forest. There is also at least one sighting from the Mammoth area. There have been no detections for California wolverine in the Heavenly SUP boundary.

Sierra Nevada Red Fox

Sierra Nevada red fox (*Vulpes vulpes necator*) inhabit forested areas interspersed with riparian and meadow habitats and brush fields. The range of this species is described as the northern California Cascades eastward to the northern Sierra Nevada, then south along the Sierra Nevada crest to Tulare County. In the Sierra Nevada, preferred forest types include red fir, lodgepole pine, and subalpine fir. Jeffrey pine, eastside pine, and montane hardwood-conifer habitats are also used. The species occurs mainly at elevations greater than 7,000 feet, and seldom is observed below 5,000 feet.

The Sierra Nevada red fox moves seasonally from higher elevations in winter to mid-elevation forests during the summer. Predator avoidance in the open may not be a problem for this native fox, as they are known to hunt in open areas.[63] Although little is known about this subspecies and no specific criteria for analyzing its habitat have been developed, it has been assumed that the Sierra Nevada red fox, like other subspecies of red fox, may be more adaptable and opportunistic than other forest carnivores. Further, it has been assumed that if the more restrictive habitat requirements of Pacific fisher, American marten, willow flycatcher and California spotted owls are provided, the habitat requirements of Sierra Nevada red fox will also be met.[64] There are no records of sightings for the Sierra Nevada red fox within the Heavenly SUP boundary.

As of 1977, Sierra Nevada red fox populations were thought to be either maintaining themselves at a reduced level or slowly declining. There is little current information available to either justify or counter this assumption.[65]

American Marten

The American marten occurs throughout the Sierra Nevada Province where suitable habitat is present. Based on an extensive review of scientific literature and expert opinion, Freel described preferred habitat as dense (60 to 100 percent canopy closure), multi-storied, multi-species late seral stage coniferous forest of red fir, red fir/white fir mixtures, lodgepole pine, and mixed conifer.[66] A high number of large snags and downed logs is associated with preferred habitat. Habitat areas are generally located in close proximity to dense riparian corridors that are used as travel ways. An interspersion of small (<1 acre) openings with good ground cover is required for foraging. For the northern Sierra Nevada, Freel cites elevational records of 3,400 to 10,400 feet, with an average elevation of 6,000 feet for preferred habitat.

[63] Duncan Furbearer Interagency Workgroup, 1989
[64] Freel, 1991
[65] USDA Forest Service, 1992
[66] Freel, 1991

According to Freel, numerous and heavily traveled roads are not desirable within American marten habitat areas as they are associated with habitat disruption and animal mortality.[67] Roads may also reduce food availability for American marten by increasing road kills in prey populations and creating behavioral barriers to foraging movements.[68] Occasional one and two lane forest roads with moderate levels of traffic are not believed to limit American marten movements.[69] American marten have been detected within the Heavenly SUP boundary.

Townsend's Big-eared Bat

A Forest Service sensitive species, Townsend's big-eared bat is found throughout the Sierra Nevada in all but alpine and subalpine habitats. This species is most often found associated with mesic habitats. Natural caves, mines and/or human made structures are required as hibernacula and for maternity roosts. This species is sensitive to disturbance of roost sites by human activity. No hibernacula are within the Heavenly SUP area. The closest know occurrence of this species is at Skunk Harbor, over 10 miles away.

Northern Leopard Frog

The northern leopard frog is a Sensitive species on all Sierra Province National Forests in the Pacific Southwest Region. Currently, populations occur to the west of the forests in the Central Valley and to the east of the Tahoe basin in Nevada along the lower Truckee River and in the Carson Valley.[70]

Surveys for amphibian species were conducted at Mud Lake and Ginny Lake in the summer of 1997. Results of these surveys indicated that there was no evidence of the occurrence of northern leopard frog at these two sites.[71] Historic accounts of the northern leopard frog in the Lake Tahoe Basin include observations at Trout Creek, June 1934, Fallen Leaf Lake, July 1919, and Taylor Creek, June 1995.[72] No detections of northern leopard frogs have occurred in the Basin in recent years.[73]

Management Indicator Species

Mountain quail

The mountain quail is a Region 5 Management Indicator Species and was selected as the MIS for early and mid seral coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, red fir, and eastside pine) habitat in the Sierra Nevada. Mountain quail are found particularly on steep slopes, in open, brushy

[67] Ibid.
[68] Allen, 1987
[69] Freel, 1991
[70] USDA Forest Service, 1998. Personal Communication – Jennings; Pankik
[71] Ibid. Personal Communication – Schlesinger
[72] Ibid.
[73] Romsos et al., 2000

stands of conifer and deciduous forest and woodland, and chaparral; it may gather at water sources in the summer, and broods are seldom found more that 0.8 km (0.5 mi) from water.[74]

Hairy woodpecker

The hairy woodpecker was selected as the MIS for the ecosystem component of snags in green forests. Medium (diameter breast height between 15 to 30 inches) and large (diameter breast height greater than 30 inches) snags are most important. The hairy woodpecker uses stands of large, mature trees and snags of sparse to intermediate density; cover is also provided by tree cavities (CDFG 2005). Mature timber and dead snags or trees of moderate to large size are apparently more important than tree species (Siegel and DeSante 1999).

Sensitive Species Surveys

For a discussion of sensitive species surveys that were performed prior to approval of the Heavenly MP 96, please refer to Harland and Bartholomew.[75] Since approval of the MP 96 a number of surveys have been performed, namely California spotted owl, northern goshawk and American marten. Surveys were conducted utilizing habitat that was identified in the 1995 Draft EIR/EIS/EIS. Each survey effort and results since 1996 is briefly described below for each species. Habitat maps for these species were updated along with the 2007 Draft EIR/EIS/EIS and used for surveys. For species not listed below, no formal survey effort has been performed as of the writing of this document.

Bald Eagle

Water impoundments within Heavenly SUP area include the Sky Meadow Reservoir and East Peak Reservoir. As noted above, Sky Meadow Reservoir was stocked with Lahontan cutthroat trout in 1980. However, the reservoir has not been stocked since that time, and it is not known to currently contain fish. East Peak Reservoir currently holds a population of rainbow trout that were stocked in 1992 and provides a potential source of forage fish for bald eagles. This small, high-elevation water impoundment is frozen over much of the winter season, making the fish stock unavailable as a prey base for wintering bald eagles.

Late successional conifer stands within Heavenly's SUP area provide potentially suitable nesting habitat for bald eagles. No sightings of bald eagles were reported during any of the biological field surveys conducted at Heavenly between1992–2006. One incidental sighting was reported by Forest Service personnel during a snow tracking survey in fall 2005. The single eagle was perched along the Roundabout access road near where this trail crosses the *Gun Barrel* trail; however, there are no nests known to occur.

[74] CDFG, 2005
[75] Harland and Bartholomew, 1995

American Marten

In 2001, Heavenly in conjunction with LTBMU and Desert Research Institute (DRI) approved and provided funding to monitor American marten within Heavenly's SUP area. Detection stations were placed in the same locations as the 1993 study conducted by Parsons HBA. In addition to detection stations, snow tracking surveys were also performed to determine which habitat type(s) marten utilize for foraging activities. Marten were detected in more locations (mountain wide) during the 2002 survey than the 1993 survey. Based on the detections of marten in 2002, marten were observed as nocturnal during the winter months and diurnal during the summer months. For detailed results and a discussion of the detections, please refer to the final report.[76]

Since the 2002 study, snow tracking surveys have been performed within the SUP area and Multiple Species Inventory and Monitoring (MSIM) Program camera stations were set up within and adjacent to the Heavenly's operational boundary. These studies are ongoing and results are in preparation. A management summary of the MSIM protocol is located in the 1995 Draft Heavenly Mountain Resort Master Plan Technical Appendix 7B. Marten were detected during both the snow tracking and MSIM surveys.

Snow tracking surveys were conducted in January thru March 2005 in the areas of Northbowl Express, Sand Dunes Lodge and *Skyline Trail*. Evidence of marten activity was recorded at Northbowl Express and *Skyline Trail*. Snow tracking and automated camera systems installed in November 2005 detected martens on *Skyline Trail*, *Skiways* gladded trail, Northbowl Lift and Ski Trail S-10 alignment, the Gondola Ski and Snowshoe Trail, and the Zipline area. There were detections of American Marten throughout the Heavenly SUP area in 2006. One incidental daytime detection was recorded just above East Peak Lake in the daytime by HBA biologists in July 2008.

California Wolverine

The 2002 and 2005 winter and summer MSIM forest carnivore surveys and subsequent snow tracking studies conducted failed to document the presence of wolverines within the Heavenly SUP area. Although suitable habitat exists, wolverines are not expected to occur within the Heavenly SUP area.

Sierra Nevada Red Fox

No Sierra Nevada red fox tracks or photographs were obtained and no sign of the species was observed during the winter and summer MSIM forest carnivore surveys or snow tracking conducted within the Heavenly Ski Resort Special Uses Permit Boundary. Although potentially suitable habitat is available, as evidenced by the presence of gray fox, the Sierra Nevada red fox is not expected to occur within the Heavenly SUP area.

[76] Cablk and Spaulding, 2002

California Spotted Owl and Northern Goshawk

One California spotted owl has been detected in the Heavenly SUP area since the surveys commenced in 1993. This sub-adult female was located in the Cold Creek drainage in August of 2003. This owl was determined to be non-nesting and was more than 1.25 miles from any existing or proposed development associated with Heavenly. No other California spotted owls have been detected during previous or subsequent surveys in the Heavenly SUP area.

California spotted owl detections did not occur during survey efforts completed in 2003 through 2006 in the High Meadows Restoration Project area.

The 2007 Draft EIR/EIS/EIS summarizes the surveys for northern goshawk from 1992 to 2006 (Table 1, in Technical Appendix 7C).[77] Observations of northern goshawk were recorded in Daggett Creek drainage in 1992, 2001, 2003, 2004, and 2005. No other detections have been recorded within the Heavenly SUP area at the survey sample sites from 1992 through 2009.

Broadcast surveys for goshawk in the summer of 2005 yielded two detections within the Heavenly SUP area. An individual was detected but no nest was found in the *Galaxy* and *Perimeter* trails and a juvenile was detected between the Stagecoach and Northbowl Express chairlifts.

California spotted owl and/or northern goshawk surveys resulted in no detections during survey efforts in 2009 within the Heavenly SUP area.

Great Gray Owl

No great gray owls were detected during surveys completed between 1992 and 2009 spotted owl surveys in the Heavenly SUP area.

TRPA Special Interest Species

American Peregrine Falcon

The American peregrine falcon is an uncommon resident and migrant within the Sierra Nevada. These birds are dependent on cliffs and ledges for cover and breeding. There are no confirmed detections of American peregrine falcon within the Lake Tahoe Basin, and no suitable habitat in the Heavenly SUP area.

Osprey

Osprey are found in a variety of habitats associated with large rivers, lakes, and coastlines. In the Sierra Nevada, the osprey is a summer resident only. Nesting sites include large coniferous and deciduous trees, cliffs, and pole tops located near or over water. The species feeds primarily on fish, which it captures by

[77] Parsons, 2006

hovering over the water and plunging feet-first after its prey. Other prey types include rodents, birds, small vertebrates, and crustaceans. There are no known osprey nests found in the Mountain SUP area.

Waterfowl Species

The 1988 Forest Plan identifies waterfowl species as ducks, geese, and coots. These are game species, although firearm closures imposed by different municipalities in the Basin limit hunting. Non-consumptive uses, such as viewing, of waterfowl are an appreciable part of the overall non-consumptive uses of wildlife and are expected to increase as dispersed recreation increases. Incidental sightings of waterfowl have occurred at the Heavenly SUP area.

Mule Deer

Although mule deer is a TRPA special interest species, the 1988 Forest Plan provides specific management direction for this species. The 1988 Forest Plan directs the LTBMU to maintain road density to less than 5 miles per square mile of land area and to protect mule deer fawning areas by constructing no permanent roads within 100 feet of meadow edges and by avoiding meadow crossings.

Deer numbers for the Carson River and Loyalton-Truckee herds were at 26 to 40 percent of historical levels in 1988.[78] Management plans for the two herds developed by the CDFG call for protection of key deer use areas from recreational and residential development. Guidelines in the plans also call for increasing deer habitat capability through vegetation and recreation management aimed at increasing early and mid-successional habitat and reducing disturbance to fawning and foraging areas.

Deer habitat in the Lake Tahoe Basin consists of fawning and summer range for the Carson River and Loyalton-Truckee herds. The project area contains mapped summer range for the Carson River deer herd and numerous sighting have occurred within Heavenly's SUP area.

TRPA Special Interest Species Surveys

Golden Eagle

Adult and juvenile golden eagles were observed during the summer 1993 forest carnivore surveys. These birds were observed foraging and roosting in open coniferous forest habitat in the vicinity of East Peak and Monument Peak. No nesting sites were located. No further detections were recorded during field surveys conducted at Heavenly from 1993 to 2009.

Osprey

East Peak Lake provides marginal foraging habitat for osprey. Sky Meadow Reservoir is small and is not likely to contain a fishery (no fish were detected in the section of Heavenly Valley creek or the reservoir

[78] USDA Forest Service, 1988a

in 2005), and as such is not considered to be suitable foraging habitat. No osprey were observed during field surveys conducted within the Heavenly SUP area from 1992 to 2009.

Mule Deer

No species-specific surveys have been performed in the project area for mule deer. However, mule deer were detected during MSIM and project specific camera surveys and snow-tracking within the Heavenly SUP area in 2005.

DIRECT, INDIRECT, AND CUMULATIVE ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Alternative 1 is a true no action alternative and reflects a continuation of existing operations and ski area management at Heavenly without major changes, additions, or upgrades on LTBMU land other than those previously approved, yet-to-be implemented mountain improvements. Effects of previously-approved mountain improvements have been considered in prior documents and are considered herein as part of the environmental baseline. The current status of wildlife species and habitats and how they have been affected by existing conditions are described in the Affected Environment section.

The No Action Alternative would impose no direct, indirect, or cumulative impacts or benefits to the wildlife and habitats addressed in this document (Table 3B-3), including federally listed, Forest Service, or TRPA special status species.

Alternative 2

Alternative 2 includes the implementation of *California Trail* ESRHR Prescription, Gondola Lodge, Umbrella Bar Relocation, Galaxy Lift upgrade, Ski Trails 14, 15, U3 and U4 and would result in approximately 40.2 acres of disturbance to California Wildlife Habitat Relationship System habitat types shown in Table 3D-3. In Table 3D-3, the first three letters of the center column correspond with the habitat type, the number denotes the tree size classification and the fourth letter denotes the density of the habitat type (if applicable).

Table 3D-3:
CWHR Habitat Disturbance By Project

2010 Capital Project Component	WHR Code	Total Acres
California Trail	ADS	0.72
	LPN4S	0.37
	PGS	1.95
	SCN4P	0.54
	SCN4S	0.64
California Trail Total		*4.21*
Galaxy Lift	ADS	0.01
	BAR	0.02
	MCP	0.12
	RFR3P	0.02
	RFR4M	0.07
	RFR4P	0.10
	RFR4S	0.02
	SCN4S	0.01
Galaxy Lift Total		*0.38*
Galaxy Snowmaking	ADS	0.25
	BAR	1.16
	MCP	4.27
	PGS	0.44
	RFR3P	0.33
	RFR4M	2.82
	RFR4P	4.95
	RFR4S	0.42
	SCN4P	0.23
	SCN4S	0.36
	SMC4M	0.01
Galaxy Snowmaking Total		*15.25*
Galaxy Trails	BAR	0.18
	MCP	1.96
	RFR4M	6.49
	RFR4P	6.82
	SCN4P	1.04
	SCN4S	0.73
Galaxy Trails Total		*17.21*
Gondola Lodge	BAR	1.57
	PGS	0.00
	SCN4S	0.36
Gondola Lodge Total		*1.93*

Table 3D-3:
CWHR Habitat Disturbance By Project

2010 Capital Project Component	WHR Code	Total Acres
Magic Carpet Lift	SCN4P	0.06
Magic Carpet Lift Total		**0.06**
Gondola Lodge Road	BAR	0.09
	SCN4S	0.01
Gondola Lodge Road Total		*0.10*
Umbrella Bar	BAR	0.02
Umbrella Bar Total		*0.02*
Grand Total		**39.16**

ADS: Alpine Dwarf Shrub
BAR: Barren
LPN: Lodgepole Pine
MCP: Montane Chaparral
PGS: Perinneal Grass
RFR: Fed Fir Forest
SCN: Subalpine Conifer
4: Small Tree (Crown Diameter 12'–23.9')(DBH 11"–23.9")
S: Sparse (10–14.9% Canopy Cover)
P: Open (25–39.9% Canopy Cover)
M: Moderate (40–59.9% Canopy Cover)

Threatened and Endangered Wildlife Species

No Threatened or Endangered wildlife species are present, or have suitable habitat that would be impacted, within the project areas. The South Fork of Daggett Creek does not contain suitable habitat for Lahontan cutthroat trout, and therefore upgrading the Galaxy Lift and construction of proposed trails U3, U4, 14, and 15 would not result in impacts to this species, and Alternative 2 would have no impact on Lahontan cutthroat trout.

LTBMU Sensitive Wildlife Species

Bald Eagle

Bald eagles have not been sighted within the Heavenly SUP area since 2007. No impacts to the two water bodies that may be utilized by bald eagles as foraging grounds would occur as a result of any of the proposed projects listed in the project description. Proposed trails U3, U4, 14 and 15 do not contain large snags or trees that would be suitable nesting or roosting trees for bald eagles. Trees proposed to be removed are of sufficient distance from East Peak Lake that it is unlikely they would be suitable for roost or rest locations for foraging activities. Alternative 2 would not impact Bald eagles.

California Spotted Owl and Northern Goshawk

Suitable habitat for California spotted owl and northern goshawk exists within the Heavenly SUP area. Suitable habitat for northern goshawk and California spotted owl can be reviewed in the 2007 EIR/EIS/EIS (Figure 3.9-1). Construction of the Gondola Lodge, relocation of the magic carpet surface

lift, relocation of the Umbrella Bar and implementation of the ESRHR Prescription on *California Trail* would not result in the direct removal of California spotted owl or northern goshawk habitat. Direct habitat removal would accompany construction of proposed trails U3 (5.4 acres) and U4 (4.2 acres) totaling 9.6 acres of habitat loss.

California spotted owls have never been detected in the 9.6 acres of suitable habitat that would be directly removed as a result of construction of proposed trails U3 and U4. As no spotted owls have been detected, no direct impacts to this species would result from implementation of the Proposed Action. The potential exists for California spotted owls to occupy the project area prior to commencement of construction.

Northern goshawks have been detected in the stand of trees that is proposed to be modified for construction of trails U3 and U4. The last detection was in 2005. Dawn acoustical surveys in the Daggett Creek drainage and broadcast surveys have been performed annually since the last detection with no observations. In the years that detections were recorded, no nest tree was ever located; therefore the stand is likely utilized for foraging. The potential does exist for northern goshawks to occupy the project area prior to commencement of construction. As no northern goshawks have been detected in the last four survey seasons, no direct impacts to this species would result from implementation of the Proposed Action.

Noise from construction activities has potential to impact the suitability of habitats adjacent to the project locations. On a temporary, construction basis—blasting and large construction equipment—could decrease the suitability of the habitat for use by northern goshawks and California spotted owls. The construction noise would be intermittent and for a relative short duration (three months) and would not have a lasting impact on habitat suitability due to the existing human activity and associated noise. Existing noise in the project areas include extensive snowmaking, snow grooming, human activity and chairlift operations. The introduction of snowmaking into the Galaxy pod area would increase noise and activity in the area and have the potential to decrease the suitability of habitat for northern goshawks and California spotted owls. However, as no spotted owl detections have been recorded within the project area, no indirect impacts to this species are anticipated to occur. Likewise, Northern goshawks have not been detected in the Daggett Creek drainage since 2005 and no indirect impacts to this species are anticipated.

Surveys for California spotted owls and northern goshawks are conducted annually within the suitable habitat located within Heavenly's SUP area. If either species are detected within the project area and determined to be nesting, a Protected Activity Center (PAC) will be delineated in accordance with the Sierra Nevada Forest Plan Amendment Record of Decision (January 2004). If any of the proposed 2010 Capital Project are located inside or within 0.25 mile of the PAC, a Limited Operating Period will be implemented which would limit construction activities and vegetation treatments during the breeding

season (March 1 though August 31 for California spotted owl) and (February 15 through September 15 for northern goshawk).

American Marten

Construction of the Gondola Lodge and relocation of the Umbrella Bar would not have any direct effects on marten as the areas where these two projects are located do not contain suitable habitat for this species. Relocation of the Magic Carpet lift would result in the removal of approximately 0.6 acre of subalpine conifer habitat, in close proximity to the existing Tamarack and Big Easy lifts as well as the existing Ski School Building located in Von Schmidt Flats. The existing area is heavily fragmented due to existing ski trails, roads and structures. Suitability of the habitat to be removed is low for a den location due to historic human disturbance and year round activities.

Implementation of the ESRHR Prescription on *California Trail*, *Perimeter* and *Galaxy* would not have any direct impacts to marten because all vegetation has been removed from these trails and only boulders and barren areas remain. These trails are not suitable locations for den sites due to compaction of the snow surface and they thereby do not allow access to subnivean corridors.

Replacement of the Galaxy lift and construction of proposed trails U3 and U4 would result in the removal of trees and modification of American marten habitat. A small number of trees are proposed for removal in order to widen the lift corridor from approximately 30 to 33 feet, with minimal impacts on marten habitat. The trees to be removed for proposed trails U3, U4, 14 and 15 would result in the modification of approximately 23.7 acres of marten habitat. All trees would be removed over snow, avoiding any ground disturbance. Installation of snowmaking lines would temporarily affect 15.3 acres of habitat, however due to the amount of habitat adjacent the area of disturbance, the temporary disturbance would have a negligible effect. Marten have been observed foraging in all types of environments within the Heavenly SUP area and since no ground disturbance would occur for proposed trails U3, U4, 14 and 15, no impact to marten den sites would occur.[79]

Indirect impacts to marten include increase human presence and activity, decreased foraging areas and noise within the resort. Construction activities for the 2010 Capital Projects would likely result in increased traffic on mountain roads, with potential to increase road kills. Of the 2010 Capital Projects, only the Galaxy lift replacement and construction of new trails would increase human presence in an area. Marten have been observed foraging in refuse generated on the mountain and within on mountain structures and increased human presence may draw marten to these areas due to increased trash generation. Grooming of the proposed trails U3, U4, 14 and 15 would result in decreased foraging area for marten, as grooming compacts snow to a level that does not allow for subnivean access to foraging areas. However, this loss of approximately 23.7 acres of foraging habitat is negligible due to the overwhelming amount of terrain available for foraging at Heavenly that is not currently groomed.

[79] Cablk and Spaulding, 2002

LTBMU Management Indicator Species

Mountain Quail

A total of 17.21 acres of mountain quail habitat will be lost through the implementation of Ski Trails U3, U4, 15 and 16. Direct effects include loss of habitat within Heavenly Mountain Resort. Indirect effects include increased human presence in the area as well as increased noise as a result of snowmaking activities. Mountain quail often migrate downslope in the winter below the snowline and therefore will not be present during winter operations. The removal of the 17.21 acres of habitat will not result in a decrease in the viability of the population of mountain quail. Habitat trends for mid seral coniferous forest has increased in the last decade from 21 percent to 25 percent of the acres on National Forest System Lands. Currently there are 2,766,000 acres of mid seral coniferous forest habitat on National Forest System Lands. The decrease of 17.21 acres of mid seral forest will have no effect on this species.

Hairy Woodpecker

A total of 17.21 acres of hairy woodpecker habitat will be lost through the implementation of Ski Trails U3, U4, 15 and 16. Direct effects include loss of 202 existing snags within the ski trails to be cut. Indirect effects include increased human presence in the area as well as increased noise as a result of snowmaking activities. Habitat trends for medium sized and large snags per acre has increased for red fir forest as well as mixed conifer forest on National Forest System Lands. The decrease of 202 snags within Heavenly Mountain Resort is not expected to have an adverse effect on hairy woodpecker or its population viability. No effect to this species will occur as a result of 2010 Project Implementation.

TRPA Sensitive Species

TRPA Special Interest Species associated with Wildlife Threshold 1 have suitable habitat within the project area. Table 3-D4 below outlines that states “Provide a minimum number of population sites and disturbance zones for TRPA listed species. Perching trees and nesting sites shall not be physically disturbed, nor shall the habitat within disturbance zone be manipulated in any manner, unless needed to enhance habitat quality.”

Table 3D-4:
TRPA Special Interest Species Threshold Standard Determination

Species	Population Sites[1]	Disturbance Zone (mi.)	Potential to Impact Threshold Standard? Y/N
Northern goshawk (*Accipter gentiles*)	12	0.50	N
Osprey (*Pandion haliaetus*)	4	0.25	N
Bald eagle (winter) (*Haliaeetus leucocephalus*)	2	Mapped	N
Bald eagle (nesting)	1	0.50	N
Golden eagle (*Aquila chrysaetos*)	4	0.25	N
Peregrine falcon (*Falco peregrinus anatum*)	2	0.25	N
Waterfowl	18	Mapped	N
Mule deer (*Odocoileus hemionus*)	Critical fawning habitat	Meadows-Critical fawning habitat is mapped	N

Osprey

East Peak Lake and the Sky Meadows Dam Reservoir are the only two foraging locations for osprey within the SUP area. No modifications to either of these water bodies would occur as a result of Alternative 2. No modifications to roost trees adjacent to the water bodies would result. Therefore, no direct or indirect effects to osprey would occur as a result of Alternative 2 implementation.

CUMULATIVE IMPACTS

The Introduction to Chapter 3 identifies past, present and reasonably-foreseeable future projects within the Heavenly SUP area that have potential to affect the listed, sensitive and management indicator wildlife species and Habitat within Heavenly's permitted lands. All past projects underwent site-specific environmental analysis prior to their approval, and now are part of the baseline species and habitat conditions. Future projects, including the Phase II and III projects in the MPA 07 that have been analyzed programmatically, will necessitate site specific analysis before they can be approved or implemented; the potential effects of which will be compared against the baseline biological conditions.

A summary of the MPA 07 project components that have potential to cumulatively affect listed, sensitive and/or management indicator species and/or habitat upon full build-out includes:

- Eight lifts are anticipated to be constructed at buildout of the MPA 07, for a total of 37 lifts (23 aerial lifts and 14 surface lifts) within Heavenly. Lift construction generally results in tree removal as well as ground disturbance that may affect listed, sensitive or MIS suitable habitat, individuals or populations.

- Two additional guest service facilities are anticipated to be located across the ski area (NFS and private lands), for a total of 10 guest service facilities. Similar to lift construction, facility construction is accompanied by tree removal as well as ground disturbance and revegetation that may affect listed, sensitive or MIS suitable habitat, individuals or populations.
- A developed terrain network consisting of roughly 813 acres of developed trails (compared to the existing 662 acres) would result in tree removal as well as ground disturbance associated with snowmaking infrastructure, the ESRHR Prescription, and revegetation of the disturbed areas. Build-out of the MPA 07 also includes the addition of an entirely new trail pod—Wells Fargo. This would result in tree removal outside the current operational boundary. These developments may affect listed, sensitive or MIS suitable habitat, individuals or populations.

It is important to note that the Management Emphasis of the Heavenly SUP area is on Alpine skiing, which is accompanied by modification to the biological environment. In a cumulative context, loss of suitable habitat for wildlife species is anticipated to occur with build-out of the MPA 07, but is not expected to result in the loss of viability of any species as a result. Site-specific environmental analysis will be necessary to make specific determinations on a species-by-species basis. Project Design Features, best management practices, and adherence to the avoidance to sensitive animal species will alleviate impacts to vegetation communities and sensitive species. These practices have been, and will continue to be, applied to proposed projects undergoing site-specific environmental analysis.

This analysis indicates that the 2010 Capital Projects can be implemented in a manner that is consistent with Forest Plan and Management Area direction for the Heavenly SUP area. All future projects will undergo site-specific environmental analysis compared to the baseline biological environment.

E. VEGETATION

SCOPE OF THE ANALYSIS

This analysis of wildlife resources is tiered to the Sierra Nevada Forest Plan, as amended, and incorporates by reference the 2007 Final EIR/EIS/EIS.[80] The wildlife and vegetation sections of the FEISR describe the entirety of Heavenly's SUP area and detail the background, setting and regulatory environment. This section represents a more detailed vegetation analysis conducted specifically for Heavenly's proposed 2010 Capital Projects (Project Record Documents 2 and 4).

AFFECTED ENVIRONMENT

2010 Capital Projects are composed of four project disturbance areas: 1) Snow Beach; 2) the Top of the Gondola area; 3) *California Trail*; and 4) the Galaxy Pod. The project area encompasses approximately 50 acres and ranges in elevation between 7,800 and 9,700 feet. All of the projects are located in the Heavenly SUP boundary. Please refer to Chapter 3F Wildlife for a breakdown of the project by California Department of Fish and Game Wildlife Habitat Relationship System (CWHR) habitat types.

Top of Gondola Area

The Top of Gondola Area is surrounded by lodgepole pine and red fir forest. Heavy human disturbance and activity are present in the project area during both summer and winter months as it is the main access point to the resort during the winter and summer. The location of the proposed Gondola Lodge is set into the hillside which contains limited trees, sparse groundcover (*arctostaphylos nevadensis*) and numerous boulders. The location of the relocated Magic Carpet conveyor lift is relatively open with trees well spaced and low canopy cover and contains suitable habitat for the following sensitive plant species: starved daisy (*Erigeron miser*), short-leaved hulsea (*Hulsea brevifolia*), Galena Creek rock cress (*Arabis rigidissima var. demota*), and Tahoe draba (*Draba asterophora var. asterophora*).

Snow Beach

The Snow Beach structure is within a presently disturbed area, and has been utilized as an outdoor seating area and as a ski trail. No suitable sensitive plant habitat exists within the disturbance area as the location is an existing graded ski trail and roadway.

California Trail

California Trail is barren land that was cleared of all trees and shrubs during original construction in the late 1960s. The existing ski trail is covered by large boulders, downed logs, bare ground and minor ground cover. The project area contains suitable habitat for the following sensitive plant species: starved daisy (*Erigeron miser*), short-leaved hulsea (*Hulsea brevifolia*), Galena Creek rock cress (*Arabis*

[80] USFS, 2007

rigidissima var. demota), and Tahoe draba (*Draba asterophora var. asterophora*) which is known to occur within the ski trail.

Galaxy Pod

The Galaxy Pod project area is composed of a mix of red fir forest, subalpine conifer, montane chaparral, and barren habitats. The northerly aspect slopes are dominated by subalpine conifer and red fir forest, while the south and east facing aspects contain a higher degree of montane chaparral. The South Fork of Daggett Creek runs from East Peak Lake west and down slope through the Galaxy Pod. Minimal montane riparian vegetation is present along the creek banks within the project area. A restored mitigation wetland area is present along the course of Daggett Creek and below the Galaxy Lift corridor. The project area contains suitable habitat for sensitive plant species: starved daisy (*Erigeron miser*), short-leaved hulsea (*Hulsea brevifolia*), Galena Creek rock cress (*Arabis rigidissima var. demota*), and Tahoe draba (*Draba asterophora var. asterophora*), *Botrychium* species, Bolander's candle moss (*Bruchia bolanderi*), subalpine fireweed (*Epilobium howellii*), and veined water lichen (*Peltigera hydrothyria*).

Threatened, Endangered and Sensitive Plant Species

Listed and proposed plant species that were considered for this project included those identified by the U.S. Fish and Wildlife Service (USFWS) and Forest Service as potentially present on the LTBMU or potentially present in Heavenly's SUP area. Table 3E-1, below, identifies plants that may be present within the project area. Other listed or proposed plant species known to occur elsewhere on the LTBMU were not considered in this analysis because their habitats do not occur in the project area, they have no affinities to project area habitats, the project area is outside of the species' range, and/or the Proposed Action would have no effect on these other species. There are no Threatened or Endangered plant species that have suitable habitat within the project area.

Table 3E-1:
Proposed and Sensitive Plant and Fungi Species with Potential Habitat in the Project Area

Species	Status	Habitat in project area	No habitat	Sensitive species habitat characteristics found in project:
Arabis rigidissima var. *demota* Galena Creek rock cress	S	X		Species is found in open, rocky areas along forest edges of conifer and/or aspen stands. Usually found on northerly aspects above 7,500' in elevation. All three project locations have potential for this species; however, it was not observed in the project footprints or in the surrounding vicinity.
Arabis tiehmii Tiehm's rock cress	S		X	Species is known from open rocky soils in the Mt. Rose Wilderness. There are not open rocky areas in the project area; there are only open sandy areas with interspersed rocks.
Botrychium ascendens Upswept moonwort	S	X		*Botrychium* species share similar preferences in habitat, *i.e.,* wet or moist soils such as marshes, meadows, and along the edges of lakes and streams at elevations between 4,700' and 9,000'. They generally occur with mosses, grasses, sedges, rushes, and other riparian vegetation. There are wet moist soils present in the project area; along the banks of Daggett Creek in the Galaxy pod.
Botrychium crenulatum Scalloped moonwort	S	X		See *Botrychium ascendens.*
Botrychium lineare Slender moonwort	S	X		See *Botrychium ascendens.*
Botrychium lunaria Common moonwort	S	X		See *Botrychium ascendens.*
Botrychium minganense Mingan moonwort	S	X		See *Botrychium ascendens.*
Botrychium montanum Western goblin	S	X		See *Botrychium ascendens.*
Bruchia bolanderi Bolander's candle moss	S	X		Montane meadows and stream banks are favored habitat. This moss tends to grow on bare, slightly eroding soil where there is little competition from other vegetation. Habitat is present along the banks of Daggett Creek in the Galaxy pod.
Dendrocollybia racemosa Branched collybia	S		X	This species is a mycoparasite growing on old decayed or blackened mushrooms or occasionally in coniferous duff, usually within old growth stands. There are no areas with coniferous duff in old growth within the project vicinity.
Draba asterophora var. *asterophora* Tahoe draba	S, SI	X		Species is found in rock crevices and open granite talus slopes at high elevations between 8,000' to 10,200' on northeast facing slopes. Tahoe Draba were observed in the project vicinity on *California Trail* above 9,200' elevation.

Table 3E-1:
Proposed and Sensitive Plant and Fungi Species with Potential Habitat in the Project Area

Species	Status	Habitat in project area	No habitat	Sensitive species habitat characteristics found in project:
Draba asterophora var. *macrocarpa* Cup Lake draba	S, SI		X	This species is found on steep, gravelly or rocky slopes at elevations of 8,400' to 9,235'. While this project is within the range of habitat the site was flat compared to where most Cup Lake draba occurs. This species was not seen during surveys.
Epilobium howellii Subalpine fireweed	S	X		Plants are known from wet meadows and mossy seeps at 6,500' to 9,000' in subalpine coniferous forest. There are no meadows or seeps in project area, however moist soils surrounding Daggett Creek in the Galaxy pod may provide suitable habitat.
Erigeron miser Starved daisy	S	X		Plants are known from high elevation granitic rock outcrops above 6,000'. Rock outcrops in the project areas were surveyed and no species were observed.
Eriogonum umbellatum var. *torreyanum* Torrey's or Donner Pass buckwheat	S	X		This species grows in dry gravelly or stony sites, often on harsh exposures such as ridge tops or steep slopes. The project area is in dry gravelly sites and forested areas. This species was not observed.
Helodium blandowii Blandow's bog-moss	S		X	Habitat for this moss is in bogs and fens, wet meadows, and along streams under willows. There are no bogs, fens, or wet meadows in project area.
Hulsea brevifolia Short-leaved hulsea	S	X		This species is known primarily from red fir forests, but has also been found in mixed conifer forests. The elevational range of the plant is between 4,920' and 8,860'. There are coniferous forests in the project area that provide suitable habitat for this species.
Lewisia kelloggii ssp. *hutchisonii* Kellogg's lewisia	S		X	Habitat for this plant occurs on ridge tops or flat open spaces with widely spaced trees and sandy granitic to erosive volcanic soil from about 5,000' to 7,000'. Project area is above 7,000' elevation.
Lewisia kelloggii ssp. *kelloggii* Kellogg's lewisia	S		X	See above.
Lewisia longipetala Long-petaled lewisia	S, SI		X	This species occurs on the northerly exposures on slopes and ridge tops at elevations between 8,000' and 12,500' where snow banks persist throughout the summer. The plants are often found near the margins of the snow banks in wet soils. The project area is not found in areas where late snow persists; the project area is in a very dry gravelly site.
Meesia triquetra Three-ranked hump-moss	S		X	This moss prefers bogs and fen habitats, but is also found in very wet meadows. There are no bogs, fens, or wet meadows in project area.
Meesia uliginosa Broad-nerved hump-moss	S		X	This moss prefers bogs and fen habitats, but is also found in very wet meadows. There are no bogs, fens, or wet meadows in project area.

Table 3E-1:
Proposed and Sensitive Plant and Fungi Species with Potential Habitat in the Project Area

Species	Status	Habitat in project area	No habitat	Sensitive species habitat characteristics found in project:
Peltigera hydrothyria Veined water lichen	S	X		This species is found in cold unpolluted streams in mixed conifer forests. The South Fork of Daggett Creek is within in the project area.
Rorippa subumbellata Tahoe yellow cress	C, S, SI		X	This species is endemic to the shorezone around Lake Tahoe in California and Nevada. Typically found in back beach areas between elevations of 6,223' and 6,230'. There is no Lake Tahoe shorezone in the project area.

S = USFS LTBMU Sensitive Species
C = USFWS "Candidate species" for listing as threatened or endangered under the ESA
SI = TRPA Special Interest Species

Galena Creek Rock Cress

Galena Creek rock cress (*Arabis rigidissima var. demota*) is a perennial species with a single stem growing from a cluster of basal leaves. Habitat includes open, rocky areas along forest edges of conifer and/or aspen stands typically on northerly aspects above 7,500 feet. Galena Creek rock cress is a geographically restricted regional endemic that is known from the Carson Range of the Sierra Nevada in southern Washoe County, Nevada, and from the Martis Peak area in Placer County, California. Two of the known occurrences are found in the Lake Tahoe Basin, and the taxon is also found on private lands, lands managed by the Humboldt-Toiyabe National Forest in designated wilderness, Nevada Division of State Lands, and potentially on lands managed by the Bureau of Land Management. During the 2004 field season, each of the known sites was visited; samples were collected from all sites and sent to the Nevada Natural Heritage Program to verify identification. Because of difficulties in identifying the taxon in the field, a complete census has not been completed. There are eight suspected sub-element occurrences of this species at Heavenly Ski Resort.

Botrychium species

Moonwort complex (*Botrychium* species) are perennial herbs and are very small, thin, delicate, primitive ferns, typically less than 5 inches tall. Literature suggests species in the moonwort complex share similar preferences in habitat, such as wet or moist soil in marshes, meadows, and along the edges of lakes and streams at elevations between 4,700 and 9,000 feet. They grow with mosses, grasses, sedges, rushes, and other riparian vegetation and are closely associated with mycorrhizal fungi at all life stages. Moonworts are sensitive to drought and may not appear in dry years. Important habitat requirements are shade and soil moisture, presence of organic matter, and avoiding disturbance such as defoliation or root/mycorrhizal disruption.

There are no known sites of slender moonwort (*Botrychium lineare*), or common moonwort (*Botrychium lunaria*) on the LTBMU. There is one element occurrence of western goblin (*Botrychium montanum*) and three element occurrences of upswept moonwort (*Botrychium ascendens*) on the LTBMU. There are three documented occurrences of scalloped moonwort (*Botrychium crenulatum*) in the Lake Tahoe Basin; one is on California Tahoe Conservancy property in Ward Canyon at an elevation of approximately 6,400 feet with 36 individuals, the second is on the LTBMU in Blackwood Canyon at the same elevation with two individuals, and the third is located near the ski trail in Bijou Creek. All sites are on volcanic soil. There are two documented occurrences of Mingan moonwort (*Botrychium minganense*), in the Lake Tahoe Basin.

Bolander's Candle Moss

This moss has erect, tiny stems and capsules together measuring only 0.2 to 0.5 in tall. Montane meadows and stream banks are the favored habitat of this species, which tends to grow on bare, slightly eroding soil where there is little competition from other vegetation. This species has also been found growing among grasses in moist, disturbed openings. The trend of this species is unknown. Threats include trampling of stream banks and any other activity that would increase erosion or alter hydrology. This species is endemic to California and Oregon. It is known from fewer than ten occurrences from Yosemite National Park south to Sequoia National Forest in Tulare County and from Plumas County on National Forest System lands.

Tahoe draba

Tahoe draba (*Draba asterophora* var. *asterophora*) is a small perennial cushion or mat forming plant with bright yellow flowers clustered at the top of a short leafless stalk. Habitat includes rock crevices and open granite talus slopes at high elevations between 8,000 and 10,200 feet. Slopes are typically north to east facing where patches of snow persist throughout the summer months. Tahoe draba has a discontinuous distribution from Mt. Rose in Washoe County, Nevada, to Mt. Gibbs near Tioga Pass in Yosemite, California. It should be noted the specimen for the Mt. Gibbs site is a historical herbarium specimen and the population has yet to be relocated. Freel Peak and Jobs Sister in the Lake Tahoe Basin are the most frequently cited locations for this species. As an alpine perennial, very little reproduction from seed occurs, so individual long-lived plants are important for long-term species survival. Such plants are vulnerable to any activity resulting in habitat disturbance.

Subalpine Fireweed

Subalpine fireweed is a loosely clumped perennial that is less than 8 inches tall with short thread-like, minute leafy stolons. This species is distinguished from other members of the *Epilobium* complex by the small white petals (0.08 inch long) and the densely glandular-hairy stems. Plants are known from wet meadows and mossy seeps between 6,500 and 9,000 feet elevation in subalpine coniferous forests. It is distributed from Yuba Pass in Sierra County south 350 miles to Fresno County, as well as in the Twin

Lakes area in Mono County. Known sites occur on the Tahoe, Sierra, and Inyo national forests, and suitable habitats are likely present on the LTBMU.

Within the MPA 05 boundary, there are approximately 25 acres of potential habitat for subalpine fireweed identified within or adjacent to the proposed projects.

Starved Daisy

Starved daisy is a perennial herb that reaches 2 to 10 inches. The plant has many stems originating from a woody taproot. Each stem is generally unbranched, upright to leaning, with densely long spreading hairs. Plants are known from elevations above 6,000 feet on granite outcrops where small amounts of sandy soil accumulate. It is known from Nevada and Placer counties, California, on the Tahoe National Forest, and it is suspected to be present on the LTBMU. The habitat for this plant is limited and fragile, with a short growing season and has not demonstrated resilience to disturbance. All of the known occurrences are located along the Sierra Nevada crest.

Within the MPA 05 boundary, there is potential habitat for starved daisy where granitic rock outcrops occur.

Torrey's or Donner Pass Buckwheat

Torrey's buckwheat is a low sub-shrub forming loose mats. Habitat includes dry gravelly or stony sites, often on harsh exposures such as ridge tops or steep slopes at elevations between 6,000 and 8,000 feet. The species flowers in July and August. The sites are often described as "desert-like." It has been located in Nevada and Placer counties, California, primarily in the Donner Summit area. Historical collections are known from Weber Lake area, Sierra County (1873) and along Squaw Creek in Placer County (1885). It has also been reported from Modoc County. No populations are currently known from the LTBMU.

Short-leaved Hulsea

Short-leaved hulsea is a perennial plant measuring between 11 and 23 inches tall that is more or less glandular. There are 10 to 23 ray flowers, which are yellow and have short hairs; there are many yellow disk flowers. Habitat for this plant is gravelly soil in montane forests. This species is known primarily from red fir stands, but has also been found in mixed conifer forests. The elevational range of the plant in California is from 4,920 to 8,860 feet, where it has been documented at 32 occurrences, according to the California Natural Diversity Database. Short-leaved hulsea is known from Tulare, Fresno, Madera, Mariposa, and Tuolumne counties in California. There is also a record from El Dorado County that has not been verified since 1927.

There is potential habitat for short-leaved hulsea where red fir and mixed conifer forests are the dominant vegetation type within the Galaxy Pod area.

Veined Water Lichen

Veined water lichen has a foliose thallus that is gelatinous (non-stratified), dark bluish gray to dark gray or black in color, loosely apprised in ruffles, and lobes to about 0.4 in wide. The lower surface is dark and distinctly veined; apothecia are common and brown to red in color. The photobiont is Nostoc, which is frequently found free living in the same locations as this species. It is found in cold unpolluted streams in mixed conifer forests. There are no known occurrences of this aquatic lichen on the LTBMU, and it is known from fewer than 20 occurrences in California.

2009 Sensitive Plant and Noxious Weed Surveys

Sensitive species surveys were performed in July and August of 2009 for all 2010 Capital Project areas for sensitive species listed in Table 3E-1, above. A total of 109 Tahoe draba plants were observed on *California Trail*. The plants are distributed in patches across the upper portions of *California Trail* above 9,400 feet. No other sensitive plant species were detected during surveys. Known populations of bull thistle (*Cirsium vulgare*) and tall white-top (*Lepidium latifolium*), both invasive species, occur at Snow Beach.

DIRECT, INDIRECT, AND CUMULATIVE ENVIRONMENTAL CONSEQUENCES

A BE was prepared for this project and are part of the project file and incorporated herein by reference. Determination of risks to populations of sensitive plants considers the size, density, vigor, habitat requirements, locations of the population, and consequence of adverse effects on the species as a whole within its range and within the LTBMU.

Alternative 1 – No Action

The No Action Alternative is a true no action alternative and reflects a continuation of existing operations and management practices within the Heavenly SUP area and adjacent NFS lands without major changes, additions, or upgrades (other than those previously approved, yet to be implemented projects from the MPA 07). Effects of previously-approved mountain improvements have been considered in prior documents and are considered herein as part of the environmental baseline. The current status of plant species and communities and how they have been affected by conditions under this alternative are described above in the Affected Environment section.

The No Action Alternative would have no additional direct, indirect, or cumulative impacts or benefits to the plants and habitats addressed in Table 3E-1, above. Alternative 1 would have no direct, indirect, and cumulative impacts on any federally listed or R5 sensitive plant species including those identified as having habitat within the project areas: Galena Creek rock cress (*Arabis rigidissima* var. *demote*), upswept moonwort (*Botrychium ascendens*), scalloped moonwort (*Botrychium crenulatum*), slender moonwort (*Botrychium lineare*), common moonwort (*Botrychium lunaria*), mingan moonwort (*Botrychium minganense*), western goblin (*Botrychium montanum*), Bolander's candle moss (*Bruchia bolanderi*), Tahoe draba (*Draba asterophora* var. *asterophora*), subalpine fireweed (*Epilobium howellii*),

starved daisy (*Erigeron miser*), Torrey's or Donner Pass buckwheat, short-leaved hulsea (*Hulsea brevifolia*), and veined water lichen (*Peltigera hydrothyria*).

Alternative 2

Threatened and Endangered Plant Species

Galena Creek Rock Cress

Surveys completed during the summer of 2009 did not detect any Galena Creek Rock Cress within the project area. However, all of the 2010 Capital Projects would modify *suitable* habitat for Galena Creek Rock Cress, totaling 41.5 acres. As referenced in the PDFs in Table 2-3, plant surveys remain active for 5 years, after which new surveys would be required prior to construction. Therefore, Alternative 2 would have no effect on this species.

Botrychium Species and Veined Water Lichen

Suitable habitat for *Botrychium* species and veined water lichen exists along the banks of the South Fork Daggett Creek. Construction of proposed Trails U3 and 15 would entail crossing the South Fork of Daggett Creek. Proposed Trail U3 would intersect with 188 feet of Daggett Creek channel. Proposed Trail 15 would intersect with 174 feet of Daggett Creek channel. Felling of trees in the location of Daggett Creek for proposed Trails U3 and 15 carries the potential to impact suitable habitat for *Botrychium sp.* and veined water lichen. PDFs have been incorporated into the projects that include tree falling guidelines to prevent damage to stream bank habitat. Implementation of specified PDFs will prevent any direct impacts to these species. Removal of trees in close proximity to Daggett Creek may result in indirect effects to suitable habitat for these species. Canopy removal may increase the ambient temperature of the microclimates associated with riparian vegetation communities. This increase in temperature can result in desiccation of vegetation and create more xeric conditions as a result of increased solar exposure. Other indirect effects include compaction of snow over the creek channel as a result of grooming activities and skiing. Compacted snow can act as a blocking force during spring runoff and result in overtopping of banks and stream bank erosion, thereby decreasing habitat suitability for these species. The PDFs incorporated into the project that include avoidance of these species will eliminate the indirect impacts to habitat for these species if they are determined to be present.

Bolander's Candle Moss

Surveys completed during the summer of 2009 did not detect any Bolander's candle moss within the project area. The 2010 Capital Projects that would modify *suitable* habitat for Bolander's candle moss along approximately 362 feet of Daggett Creek on Trails U3 and 14 however ground disturbance from trail construction in these areas is not expected to occur as tree removal will occur over the snow. Bolander's candle moss habitat would be avoided during installation of underground snowmaking lines. Therefore, Alternative 2 would have no effect on this species.

Tahoe Draba

Tahoe draba are present on *California Trail* above elevation 9,400 feet. The Proposed Action includes implementing the ESRHR Prescription on approximately 4.2 acres of *California Trail* below elevation 9,200 due to the existence of Tahoe draba above that elevation. The 165-foot (50 m) vertical buffer between the known location of the draba population and the implementation of the ESRHR Prescription on *California Trail* would eliminate direct impacts to the known populations of this R5 Sensitive plant. Blasting and construction activities associated with the ESRHR Prescription on *California Trail* have the potential to impact the existing draba population.

Project Design Features (PDFs) have been incorporated to protect the existing Tahoe draba population located on *California Trail* in the form of identification of draba locations, 165-foot (50 m) buffer zones from proposed disturbance and covering of plants to protect during blasting activities. Implementation of these PDFs will prevent any direct and indirect impacts to the draba population located on *California Trail*. Approximately 8.7 acres of *California Trail* are suitable habitat for Tahoe draba. Of the 8.7 acres, a total of 4.2 acres of habitat are proposed to be modified with implementation of the ESRHR Prescription. Suitability of habitat should remain high as the ESRHR Prescription shall not include chipping of any woody material or use of straw, hay or any organic material that could increase ground cover and litter in the area, thereby decreasing habitat suitability.

Vegetation surveys for the remaining 2010 Capital Project sites did not detect any Tahoe draba in their proposed locations; therefore no direct or indirect impacts to Tahoe draba are anticipated to occur as a result of implementation of Alternative 2.

Subalpine Fireweed

Surveys completed during the summer of 2009 did not detect any subalpine fireweed within the project area. The 2010 Capital Projects that would modify *suitable* habitat for subalpine fireweed along approximately 362 feet of Daggett Creek are Ski Trails U3 and 14 however ground disturbance in these areas is not expected to occur as tree removal will occur over the snow. Subalpine fireweed habitat would be avoided during installation of underground snowmaking lines Therefore, Alternative 2 would have no effect on this species.

Starved Daisy

Surveys completed during the summer of 2009 did not detect any starved daisy within the project area. The 2010 Capital Project that would potentially modify 35.3 acres of *suitable* habitat for starved daisy is the implementation of ESRHRP on *California Trail* and cutting of ski trails and underground snowmaking on U3, U4, 14 and 15 and underground snowmaking on Perimeter and Galaxy. Due to absence of this species from surveys Alternative 2 would have no effect on this species.

Torrey's or Donner Pass Buckwheat

Surveys completed during the summer of 2009 did not detect any Donner Pass buckwheat within the project area. The 2010 Capital Projects that would potentially modify 6.3 acres of *suitable* habitat for Donner Pass buckwheat is the implementation of ESRHRP on *California Trail* and construction of the Gondola Lodge. Due to absence of this species from surveys alternative 2 would have no effect on this species.

Short-leaved Hulsea

Surveys completed during the summer of 2009 did not detect any short-leaved hulsea within the project area. The 2010 Capital Projects that would potentially modify *suitable* habitat for short leaved hulsea is the implementation of ESRHRP on *California Trail* and cutting of ski trails and underground snowmaking on U3, U4, 14 and 15 and underground snowmaking on Perimeter and Galaxy. Due to absence of this species from surveys alternative 2 would have no effect on this species.

Tree Removal

Implementation of the Magic Carpet relocation, Galaxy Express, proposed Trails U3, U4, 14 and 15 will result in the removal of trees. Table 3E-2, below, quantifies the trees proposed to be removed in association with implementation of each proposed component of the 2010 Capital Projects.

Table 3E-2:
2010 Capital Project Tree Removal

Project	dbh[a] (inch)	Number of Trees
Trail U3	Less than 6" dbh	268
	6" to 23.9" dbh	740
	24" and Greater	107
	Total Trail U3	*1,115*
Trail U4	Less than 6" dbh	265
	6" to 23.9" dbh	773
	24" and Greater	75
	Total Trail U4	*1,113*
Trail 14	Less than 6" dbh	218
	6" to 23.9" dbh	222
	24" and Greater	72
	Total Trail 14	*512*
Trail 15	Less than 6" dbh	262
	6" to 23.9" dbh	570
	24" and Greater	123
	Total Trail 15	*955*
Galaxy Lift Corridor	Less than 6" dbh	33
	6" to 23.9" dbh	55
	24" and Greater	9
	Total Galaxy Lift	*97*
Magic Carpet Relocation	Less than 6" dbh	0
	6" to 23.9" dbh	19
	24" and Greater	6
	Total Magic Carpet	*25*
Total Tree Removal		**3,817**

Notes:
[a] diameter at breast height

As shown in Table 3E-2, above, a total of 3,817 trees are proposed for removal in association with the 2010 Capital Projects. Of the 3,817 trees to be removed, 3,792 trees would be removed outside of the Lake Tahoe Basin in the Daggett Creek Drainage. Removal of the trees would not have an overall negative impact on the quality of the stand, as it currently is fragmented due to previous lift and trail construction. Proposed Trails U3 and U4 would be located within a stand that is surrounded by existing trails and bisected by the existing Galaxy chairlift. Proposed Trails 14 and 15 would also be located between existing trails and roadways. Indirect effects from increased fragmentation of the stand would be relatively minor as the existing condition of the forested stands within the Heavenly SUP area are "heavenly influenced and impacted by fragmentation as a result of existing runs and facilities and past corridors cut through the forested environment for old ski lifts or utility corridors, and its quality is

therefore compromised."[81] Therefore, removal of these trees would not have an overall impact on the stand. The 2007 EIR/EIS/EIS (Figure 3.8-1) identifies Late Seral forest removal associated with implementation of the planned projects. No 2010 Capital Projects would result in the removal of Late Seral forest as identified and described in the EIR/EIS/EIS.

Noxious Weeds

As previously indicated, known populations of bull thistle (*Cirsium vulgare*) and tall white-top (*Lepidium latifolium*) occur adjacent to the location of the relocated Umbrella Bar at Snow Beach. PDFs included in Chapter 2 outline preventative measures as well as treatment measures to prevent the spread of noxious weeds. Inclusion of these PDFs would ensure that no impacts occur to sensitive species listed above, or their habitats.

CUMULATIVE IMPACTS

The Introduction to Chapter 3 identifies past, present and reasonably-foreseeable future projects within the Heavenly SUP area that have potential to affect the candidate or sensitive plant species. All past projects underwent site-specific environmental analysis compared to the baseline conditions of vegetative communities prior to their approval. Future projects, including the Phase II and III projects in the MPA 07 that have been analyzed programmatically, will necessitate site specific analysis before they can be approved or implemented; the potential effects of which will be compared against the baseline conditions.

A summary of the MPA 07 project components that have potential to cumulatively affect candidate or sensitive species and/or habitat upon full build-out includes:

- Eight lifts are anticipated to be constructed at buildout of the MPA 07, for a total of 37 lifts (23 aerial lifts and 14 surface lifts) within Heavenly. Lift construction generally results in tree removal as well as ground disturbance that may affect candidate or sensitive habitat, individuals or populations.
- Two additional guest service facilities are anticipated to be located across the ski area (NFS and private lands), for a total of 10 guest service facilities. Similar to lift construction, facility construction is accompanied by tree removal as well as ground disturbance and revegetation that may affect listed, sensitive or MIS suitable habitat, individuals or populations.
- A developed terrain network consisting of roughly 813 acres of developed trails (compared to the existing 662 acres) would result in tree removal as well as ground disturbance associated with snowmaking infrastructure, the ESRHR Prescription, and revegetation of the disturbed areas. Build-out of the MPA 07 also includes the addition of an entirely new trail pod—Wells Fargo. This would result in tree removal outside the current operational boundary. These developments may affect candidate or sensitive habitat, individuals or populations.

[81] Ibid.

It is important to note that the Management Emphasis of the Heavenly SUP area is on Alpine skiing, which is accompanied by modification to the biological environment. Project Design Features, best management practices, and adherence to the avoidance to sensitive plant species will alleviate impacts to vegetation communities and sensitive species. These practices have been, and will continue to be, applied to proposed projects undergoing site-specific environmental analysis.

This analysis indicates that the 2010 Capital Projects can be implemented in a manner that is consistent with Forest Plan and Management Area direction for the Heavenly SUP area. All future projects will undergo site-specific environmental analysis compared to the baseline biological environment.

F. WATERSHED AND SOILS

SCOPE OF THE ANALYSIS

The scope of the analysis for watershed and soil resources focuses on the Heavenly SUP boundary.

REGULATORY BACKGROUND

Heavenly occupies land that is managed under the guidelines of several different agencies and entities; including the LTBMU, TRPA, and El Dorado/Alpine and Douglas counties in California and Nevada, respectively. The TRPA boundary serves to describe the 'in-Basin' and out-of-Basin' portions of the Heavenly SUP that are tributary and non-tributary to Lake Tahoe, respectively.

NFS lands that are both in- and out-of-Basin are held to management standards outlined in the 1988 Forest Plan as amended by the Forest Plan Record of Decision.

In-Basin portions of Heavenly (including NFS lands) are regulated by the TRPA Land Coverage Standards found in Chapter 20 of the Code of Ordinances. Chapter 20 sets forth "…regulations for the permissible amount of land coverage within the Region. It implements provisions of the Goals and Policies concerning the land capability system, land capability districts, prohibitions of additional land coverage in certain land capability districts, and transfer and mitigation of land coverage." Section 20.5C of the Code outlines the regulations and requirements for Relocation of Existing Land Coverage.

The classification of land is based on the report entitled Land Capability Classification of the Lake Tahoe Basin, California-Nevada.[82] The land classification system ranks land into seven levels of capability according to the frequency and magnitude of natural hazards (i.e., floods, landslides, high water tables, poorly drained soil, fragile flora and fauna, and easily erodible soil). There are grading standards set forth in Chapters 20 and 64 of the TRPA Code. Limitations include no excavation, filling, or clearing of vegetation or other disturbance of the soil between October 15 and May 1 of each year, unless approval is granted by TRPA and the Lahontan Regional Water Quality Control Board (LRWQCB). Grading schedule standards are established in Chapter 62 of the Code. A grading schedule is required by TRPA prior to approval and project construction. El Dorado and Douglas counties require new development to conform to the Uniform Building Code to ensure public safety.

Privately owned land on the Nevada-side of Heavenly is located in Douglas County.

Additionally, for land within El Dorado County, the goals, objectives, and policies of the 2004 El Dorado County General Plan apply to the impact analysis of earth resources of the project. Specific regulatory language appears in the Policy Section under Soil (Objective 7.1.1 to Objective 7.1.2).

[82] Bailey, 1974

For land in Alpine County, the goals, policies, and objectives of the Alpine County General Plan apply to the impact analysis of earth resources of the project. Specific regulatory language appears in the Conservation Element Section IA for Earth (Element I-Section I, GP Goal No. 1, Policy No. 1, Objective No. 1).

AFFECTED ENVIRONMENT

Project Area Description

Heavenly is situated along the Carson Range, east of the southern portion of Lake Tahoe. Located in the States of Nevada and California, Heavenly is typically broken down into the "California side" and the "Nevada side." Most of the California side and portions of the Nevada side of Heavenly are within the Lake Tahoe Basin which lies on the east side of the Sierra Nevada physiographic province, between elevations of 6,200 and 10,000 feet above mean sea level. The Basin includes approximately 500 square miles, with 192 square miles (38 percent) covered by Lake Tahoe.

Soils

Existing soil data has been compiled from the Natural Resources Conservation Service (NRCS) Soil Data Mart.[83] The Heavenly SUP area contains portions of the following soil surveys:

Table 3F-1:
NRCS Soil Surveys Applicable to the Heavenly Mountain Resort SUP Area

Survey Name	Date of Publication
Tahoe Basin Area, California and Nevada (CA693)	2007
Douglas County, Nevada (NV773)	2006
Toiyabe National Forest (CA729)	2006

As indicated in Table 3F-1, soil mapping has recently been updated by the NRCS for the project area. Table 3F-2 displays soil units present within the project area according to the updated mapping.

[83] http://soildatamart.nrcs.usda.gov/

Table 3F-2:
Existing Soils Present within the Heavenly Mountain Resort Project Area

Soil Survey	Map Unit	Map Unit Name	Erosion Hazard Rating
NV773	161	Witefels-Rock outcrop complex, 4 to 15% slopes	Moderate
NV773	162	Witefels-Rock outcrop complex, 15 to 30% slopes	Severe
NV773	163	Witefels-Rock outcrop complex, 30 to 50% slopes	Severe
NV773	931	Temo-Rock outcrop complex, 30 to 50% slopes	Severe
CA693	9401	Dagget very gravelly loamy coarse sand, 15 to 30% slopes	Severe
NV773	942	Toiyabe-Rock outcrop complex, 50 to 75% slopes	Severe
CA693	9421	Jobsis-Whittell-Rock outcrop complex, cool, 8 to 30% slopes	Severe
CA693	9442	Temo-Witefels complex, 15 to 30% slopes	Severe

Soil erosion hazard is described according to the NRCS classifications for the hazard of erosion on roads and trails.[84] This rating is based on the soil erosion factor K, slope, and content of rock fragments. Roads and trails are considered to be unsurfaced areas. Accounting for the amount of vegetative and ground cover on developed ski trails on these soils types, the trails at Heavenly may be appropriately classified as unsurfaced areas; erosion hazard ratings vary from slight to severe. A 'slight' hazard indicates that little or no erosion is expected under normal conditions. Similarly, 'severe' indicates that significant erosion is expected, and erosion control measures are required. The majority of soils within the Heavenly SUP area are classified as a severe risk of erosion, as indicated in Table 3F-3.

Table 3F-3:
Soil Distribution by Erosion Hazard Rating within the Heavenly Mountain Resort SUP Area

Erosion Hazard Rating	Acres (percent of SUP)
Slight	247 (2%)
Moderate	684 (7%)
Severe	9,536.5 (91%)
Not Rated	7.8 (less than 0.1%)

Soil Erosion

As described previously, approximately 91 percent of the Heavenly SUP area is comprised of highly erodible soils. Under the 2007 EIR/EIS/EIS, soil erosion was modeled on the *Easy Street* trail using the

[84] USDA NRCS, 1998

Easy Street Run Hazard Reduction (ESRHR) Prescription using the Watershed Erosion Prediction Project (WEPP) model.[85] This model is described in detail in Appendix 3.1-F of the 2007 EIR/EIS/EIS.

The *Easy Street* trail is an existing ski trail with primarily Cagwin-Rock Outcrop and Graylock soils, both of which are classified as having a high erosion hazard. Under the current soil mapping, these map units have been replaced by the Jobsis-Whittell complex and Daggett series respectively.[86] WEPP relies on four components to model erosion rates; vegetative cover type, soil type, climate, and a representative hillslope. For the *Easy Street* analysis, a custom soil type was created based on soil textures present in the project area, e.g., extremely stony loamy coarse sand. The USFS Rocky Mountain Research Station forested WEPP soil type for a sandy loam was modified using site-specific soils data.

WEPP was used to model two components: 1) general application of the ESRHR Prescription to a ski trail; and 2) installation of subsurface snowmaking infrastructure within a ski trail. Modeling of erosion was completed for pre- and post- project conditions on *Easy Street* to determine the effectiveness of the ESRHR Prescription. According to the model, the ESRHR Prescription does not result in any measureable soil loss or sediment yield on ski trails. Measureable soil loss and sediment yield only occurred under modeling of snowmaking corridors (the reader is referred to Table 3F-4).[87]

Table 3F-4:
Summary of WEPP Model Results of Snowmaking Corridors under the ESRHR Prescription

Snowmaking Corridor	Pre-treatment (Range of Surface Cover 35–70%)	Pre-project (Range of Surface Cover 64–71%)	Post-project (Range of Surface Cover 65–99%)
Average annual precipitation (in.)	36.2	36.2	36.2
Average annual runoff – rainfall (in.)	0.20	0.20	0.20
Average annual runoff – snowmelt (in.)	3.1	3.0	3.0
Average annual soil loss (tons/acre)	54.9	31.1	19.8
Average annual sediment yield (tons/acre)	46.7	19.8	15.3
Percentage yield[a] (%)	0.85	0.64	0.77

[a] ratio of soil loss to sediment yield

[85] Elliot, W.J., et al., 2000
[86] USDA NRCS, 2007
[87] Table 3F-4 is adapted from Table 10 in Appendix 3.1-F *WEPP Modeling for the Easy Street Run Hazard Reduction Demonstration Project (ESRHRP)* completed as part of the 2007 EIR/EIS/EIS.

Land Coverage

Existing land coverage at Heavenly consists of skier support facilities, parking lots, ski lifts, and paved and unpaved roads. Heavenly has the responsibility to disclose existing land coverage under the TRPA's Bailey Land Capability Classification system, including those facilities and roads within the Lake Tahoe Basin. Current land coverage analysis indicates that Heavenly has approximately 439,044 square feet of allowable land coverage available (the reader is referred to Table 3F-5).

Table 3F-5:
Existing In-Basin Land Coverage Summary

Coverage Summary	Land Capability District 1a	Land Capability District 1b	Total (square feet)
EXISTING AND ALLOWABLE COVERAGE			
Maximum Allowable Coverage Per 1996 Master Plan	--	--	2,053,854
Balance Remaining of Coverage and Banked Coverage Per Table 3.4-4 of the Final EIR/EIS/EIS	434,580	4,464	439,044
PREVIOUSLY PERMITTED PROJECTS			
North Bowl/Olympic Express Lifts Project Balances	960	396	1,356
Zip Line Adventure Ride	4,780	--	4,780
Gondola Hiking Trails	54,501	--	54,501
Mid Station Road	50,469	--	50,469
North Bowl/Olympic Express Lifts-Plan Revision	216	--	216
World Cup East Bowl Snowmaking-Plan Revision	283	--	283
Powder Bowl Lodge	38,900	--	38,900
Sky Deck Removal (10,541 SF 1b to be banked)	--	--	
California Base Surface Lift Replacement	1,572	--	1,572
Skyline Trail Grading and Snowmaking	1,134	--	1,134
Covered Surface Lift and Snowmaking	12,306	--	12,306
Subtotal	*165,121*	*396*	*165,517*
BALANCE REMAINING	**269,459**	**4,068**	**273,527**

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

The reader is referred to Table 3F-6 for a summary of the proposed 2010 Capital Projects. This table identifies projects with TRPA jurisdiction and relevant drainage basins where proposed project occur.

Table 3F-6:
Proposed 2010 Capital Improvement Project Summary

Project Name	TRPA Jurisdiction	Drainage Basin(s)	Project Area (acres)
Galaxy Lift Replacement	No	NV-1, NV-2+5	0.4
Galaxy Pod Snowmaking	No	NV-1, NV-2+5, NV-4A	15.2
Galaxy Pod Trail Construction	No	NV-2+5, NV-4A	17.2
Gondola Lodge	Yes	CA-1	1.9
Road Realignment	Yes	CA-1	0.1
Magic Carpet Relocation	Yes	CA-1	0.1
Umbrella Bar Relocation to Snow Beach	Yes	CA-1	<0.1[a]
California Trail Improvements	Yes	CA-1	4.2
Total Project Area			**39.2**

[a] The Umbrella Bar is approximately 800 square feet.

Analysis Assumptions

For the purposes of this analysis, project impacts have been classified as permanent or temporary. Permanent disturbance is defined as the conversion of undisturbed soil to impervious or highly compacted surface, such as a road. Temporary disturbance is defined as a project that does not result in the conversion of soil cover. This can include ground disturbance where topsoil is stripped off and temporarily stockpiled for use in site stabilization. Examples of temporary disturbance include new trail construction following the ESRHR Prescription, trenching, and selective tree removal over the snow.

Alternative 1 – No Action

Alternative 1—the No Action Alternative—reflects a continuation of existing operations and management practices at Heavenly without major changes, additions, or upgrades on NFS and/or adjacent private lands (other than those previously approved, yet to be implemented mountain improvements). The No Action Alternative would have no additional direct, indirect, or cumulative impacts or benefits to soil or watershed resources as addressed in this document. The reader is referred to the Affected Environment section for a description of the existing conditions.

Alternative 2 – Proposed Action

Soils

Under Alternative 2, implementation of the projects listed in Table 3F-6 would occur on soil types classified as moderate and severe for erosion hazard (the reader is referred to Table 3F-7). Project activities occurring on soil types prone to erosion have the potential to increase erosion and sedimentation within the project area.

Approximately 0.6 acre of permanent impacts, including the construction of the Gondola Lodge and relocation of summer maintenance roads, would result in the conversion of native soils to impervious or compacted surfaces that no longer provide infiltration of rainfall. Project Design Features (PDF) and BMPs identified in Table 2-3 have been incorporated to reduce erosion and control sediment laden runoff during construction according to Heavenly's Revised Construction Erosion Reduction Program (CERP).

Table 3F-7:
Proposed 2010 Capital Improvement Projects classified by Erosion Hazard Rating

Impact Type	Moderate Erosion Hazard (acres)	Severe Erosion Hazard (acres)	Total
PERMANENT IMPACTS			
Gondola Lodge	0.0	0.5	0.5
Road Realignment	0.0	0.1	0.1
Umbrella Bar	0.0	<0.1	<0.1
Subtotal Permanent Impacts	*0.0*	*0.6*	*0.6*
TEMPORARY IMPACTS			
California Trail		4.2	4.2
Galaxy Lift Clearing	0.1	0.3	0.4
Galaxy Snowmaking	4.3	11.0	15.2
Galaxy Trails	2.9	14.3	17.2
Gondola Lodge	0.0	1.5	1.5
Magic Carpet	0.0	0.1	0.1
Subtotal Temporary Impacts	*7.3*	*31.2*	*38.6*
TOTAL IMPACTS	**7.3**	**31.8**	**39.2**

Approximately 38.6 acres (98 percent) of the proposed development would be a temporary impact associated with trail construction and snowmaking installation. Tree removal activities associated with proposed trails U3, U4, 14, 15, and the Galaxy Express corridor widening would occur over the snow to avoid soil disturbance on areas with severe erosion hazards. Following snowmelt, stumps and other trail hazards would be addressed utilizing the ESRHR Prescription to minimize physical soil disturbance to the greatest extent possible. Trail construction activities would incorporate BMPs according to the CERP as appropriate (refer to Table 2-3).

The installation of snowmaking infrastructure would include approximately 11 acres of ground-disturbing activities (i.e., trenching) that represent the greatest impact to soils classified as a severe erosion hazard. According to the CERP, Heavenly would use a 30-foot wide disturbance corridor for snowmaking installation. This corridor accounts for equipment access, trenching, and a temporary spoil stockpile adjacent to the trench. During construction, excavated materials would be temporarily stockpiled and used to backfill trenches after snowmaking lines have been installed. Backfilled soils would be stabilized with

mulch, or netting on slopes exceeding a 2:1 slope, and seeded with an approved mixture to promote vegetation establishment.

In summary, the proposed projects under Alternative 2 would result in both permanent and temporary impacts to soils within the project area; however, accounting for the implementation of PDFs and BMPs per Table 2-3 as well as Heavenly's CERP, these impacts are expected to be negligible.

Soil Erosion

This analysis incorporates the ESRHR Prescription for proposed trail improvements on the existing *California Trail* and proposed new trails in the Galaxy pod. The construction of the Gondola Lodge, and relocation of the Umbrella Bar and Magic Carpet constitute impervious surfaces. Under WEPP modeling assumptions, impervious surfaces do not generate soil loss or any subsequent sediment yields. Therefore, these projects are not considered to increase erosion within the project area. While impervious surfaces typically generate localized surface runoff, these projects would be constructed in accordance with BMPs described in Table 2-3 and the CERP to mitigate both construction and long-term erosion associated with increased surface runoff.

For purposes of this analysis, representative hillslopes, climate and vegetative cover for the proposed 2010 Capital Projects are similar to the conditions modeled for *Easy Street* in the 2007 EIR/EIS/EIS. Since soil mapping has been updated by the NRCS within the SUP area, a comparative analysis of soils types for the 2010 Capital Projects, versus those encountered in the existing WEPP modeling effort for *Easy Street*, was completed. The comparison revealed the following information;

- California Trail, the Gondola Lodge, the Magic Carpet and the realigned road would occur on the same mapped soil type as Easy Street.
- The proposed Galaxy pod trails occur on soils with similar erosion hazards and soil properties to Easy Street soils.

As described under the Affected Environment, only proposed snowmaking corridors generated measureable erosion under WEPP modeling. Generally speaking, snowmaking installation involves physical disturbance to the soil surface; whereas the ESRHR Prescription was specifically designed to avoid this type of disturbance. As such, site preparation activities for the Gondola Lodge and realigned road relocation include grading activities that would disturb the soil and potentially result in measureable erosion. This analysis assumes that 16.7 acres of ground disturbance would occur under Alternative 2 that could result in measureable erosion (the reader is referred to Table 3F-8).

Table 3F-8:
Proposed Ground Disturbance – Alternative 2

Project	Acres of Ground Disturbance	Sediment Yield (tons)	TRPA Jurisdiction
Galaxy Pod Snowmaking	15.2	232.6	No
Gondola Lodge (site preparation)	1.4	21.4	Yes
Realigned Road	0.1	1.5	Yes
Total	**16.7**	**255.5**	

Utilizing modeled erosion rates generated by WEPP for the ESRHR Prescription (15.3 tons per acre for the post-project condition), the proposed ground disturbing activities in Table 3F-8 would generate approximately 255.5 tons of sediment immediately post construction. It should be noted that WEPP results are based on "worst-case" simulations for highly compacted soils on representative hillslopes with long, uninterrupted overland flow pathways. *Simulated conditions do not account for the application of BMPs or site revegetation and restoration efforts*.

Over time, the recovery of project areas would result in decreased erosion as the percentage of surface cover increases. WEPP modeling of *Easy Street* produced negligible soil loss after 15 years of passive, non-use recovery simulations. Mechanical treatments (scarifying and/or ripping of soils horizon to increase surface hydraulic conductivity), as well as seeding and mulching, would occur on proposed ground disturbing projects, and could enhance the site recovery and further reduce soils losses over the long term. As a result, the proposed 2010 Capital Projects are not expected to impact long-term rates of soil erosion in the project area.

Land Coverage

Under Alternative 2, only the new in-Basin impacts are subject to TRPA review for land coverage analysis. The relocated Magic Carpet would occur within an existing developed area, and therefore does not represent new impacts. Similarly, the *California Trail* is an existing feature and the proposed implementation of the Easy Street Run Hazard Reduction Prescription would not increase the area of the trail. The proposed Gondola Lodge and Umbrella Bar have been located within an existing disturbed area to the greatest extent possible. All proposed in-Basin projects would occur within the CA-1 drainage basin.

Table 3F-9:
Proposed In-Basin Land Coverage Summary

	Land Capability District 1a	Land Capability District 1b	Total (square feet)
	434,580	4,464	439,044
PROPOSED PROJECTS			
Adjusted Gondola Permit Coverage	(27,519)	0.0	(27,519)
Gondola Lodge	42,362	0.0	42,362
Umbrella Bar at Snow Beach	845	0.0	845
Subtotal	*15,688*	*0.0*	*15,688*
PREVIOUSLY PERMITTED PROJECTS			
North Bowl/Olympic Express Lifts Project Balances	960	396	1,356
Zip Line Adventure Ride	4,780	0.0	4,780
Gondola Hiking Trails	54,501	0.0	54,501
Mid Station Road	50,469	0.0	50,469
North Bowl/Olympic Express Lifts-Plan Revision	216	0.0	216
World Cup East Bowl Snowmaking-Plan Revision	283	0.0	283
Powder Bowl Lodge	38,900	0.0	38,900
Sky Deck Removal (10,541 SF 1b to be banked)	0.0	0.0	0.0
California Base Surface Lift Replacement	1,572	0.0	1,572
Skyline Trail Grading and Snowmaking	1,134	0.0	1,134
Covered Surface Lift and Snowmaking	12,306	0.0	12,306
Subtotal	*165,121*	*396*	*165,517*
BALANCE REMAINING	**253,771**	**4,068**	**257,839**

CUMULATIVE EFFECTS

The 2007 EIS/EIS/EIR incorporated a detailed Cumulative Watershed Effects analysis (CWE) contained in Appendix 3.1-B. This analysis included all the project elements contained within 2010 Capital Projects. This model concludes that the CA-1, NV-1, NV-2+5, and NV-4A basins, the basins where 2010 Capital Projects activities are located, would be below the threshold of concern for cumulative watershed effects with the adoption of the proposed MPA 07. All of the projects analyzed in this document were previously covered in the programmatic analysis of CWE. The programmatic analysis concluded there would be no cumulative watershed effects. This conclusion, paired with the site-specific findings of this analysis that long-term effects to soil erosion would be negligible after site recovery, supports the finding of this analysis that no cumulative effects to watershed or soils are expected to occur.

It is worth noting that climate change is likely to affect water resources and resort operations, within the Heavenly SUP area. Climate change will lead to warmer, drier winters and will increase the importance of snowmaking in the early season, and possibly the mid-season. This could affect the both the opening and closing dates of the resort, depending on the season.

Chapter 4
Consultation and Coordination

4. CONSULTATION AND COORDINATION

A. LIST OF PREPARERS

FOREST SERVICE TEAM

The following people participated in the initial scoping, were members of the Interdisciplinary Team, and/or provided direction and assistance during the preparation of this EA.

Terri Marceron	Forest Supervisor, Deciding Officer
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Mike Guarino	Team Leader/Special Use Administrator
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Jonathan Cook-Fisher	Special Uses Program Manager
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Mike Gabor	Civil Engineer
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SE GROUP – Frisco, CO

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Susan Lindström	Archaeologist

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PROJECT PROPONENT REPRESENTATIVE

Andrew Strain	Vice President of Planning – Heavenly Mountain Resort

B. AGENCIES, ORGANIZATIONS, TRIBAL GOVERNMENTS, AND PERSONS CONTACTED

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	Sarah Fowler
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Douglas County

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Lahontan Regional Water Quality Control Board – Harold Singer, Bud Amorfini

Lake Tahoe South Shore Chamber – Patrick Atherton, Bety Gorman

Lake Tahoe Visitors Authority – Carol Chaplin

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Nevada State Historic Preservation Office – Rebecca Palmer

Tahoe Regional Planning Agency – Dave Landry

Tribal Government

Washoe Archive and Cultural Center

Washoe Tribe of NV and CA

Local Media

The Sacramento Bee

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League to Save Lake Tahoe – Melissa Thaw

Sierra Club – Tahoe Area

OTHER INTERESTED INDIVIDUALS

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Chapter 5
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Chapter 6
Figures

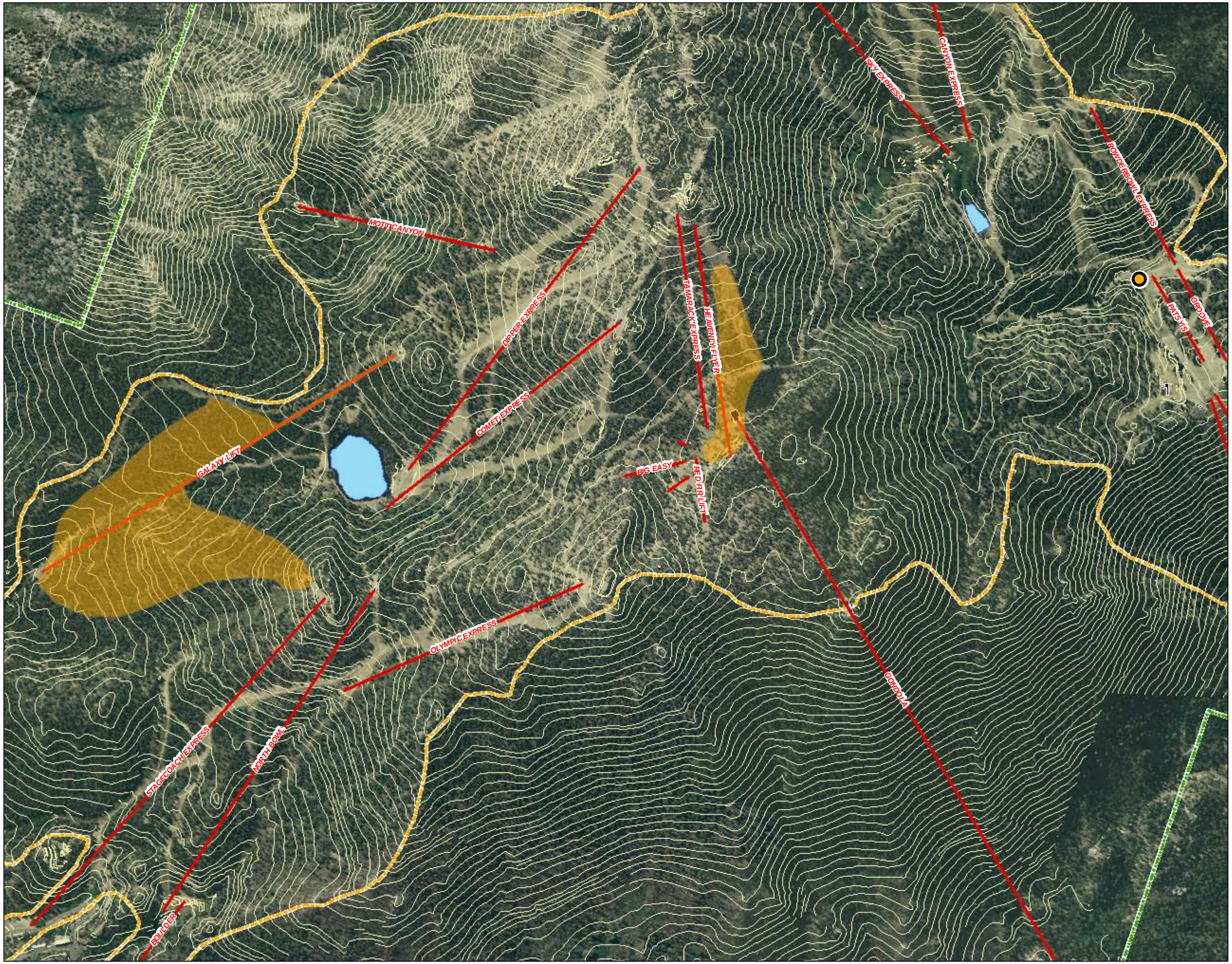
6. FIGURES

Figure 1: Proposed Project Locations

Figure 2: Top of Gondola Vicinity

Figure 3: Galaxy Pod Vicinity

Figure 4: Relocated Umbrella Bar to Snow Beach



Heavenly
LAKE TAHOE

2010 Capital Projects

Figure 1:
Proposed Project Locations

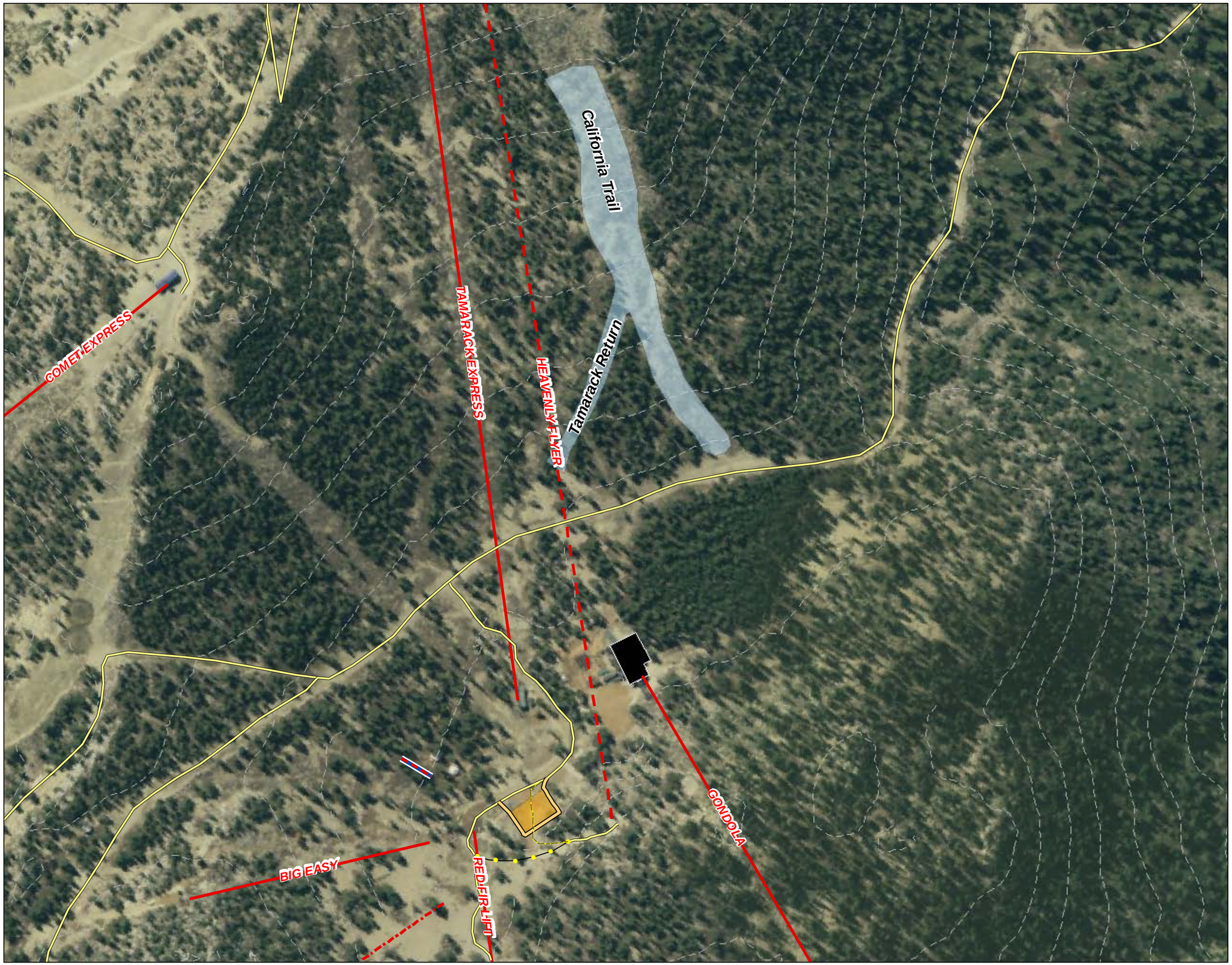
Legend

- Project Locations
- Relocated Umbrella Bar
- Lifts
- Operational Boundary
- SUP Boundary
- Lake

Contour Interval: 50 Feet
Date: December 2009
1 inch = 1,200 feet

0 600 1,200 2,400 Feet

SE GROUP



Heavenly
LAKE TAHOE

2010 Capital Projects

Figure 2:
Top of Gondola Vicinity

Legend

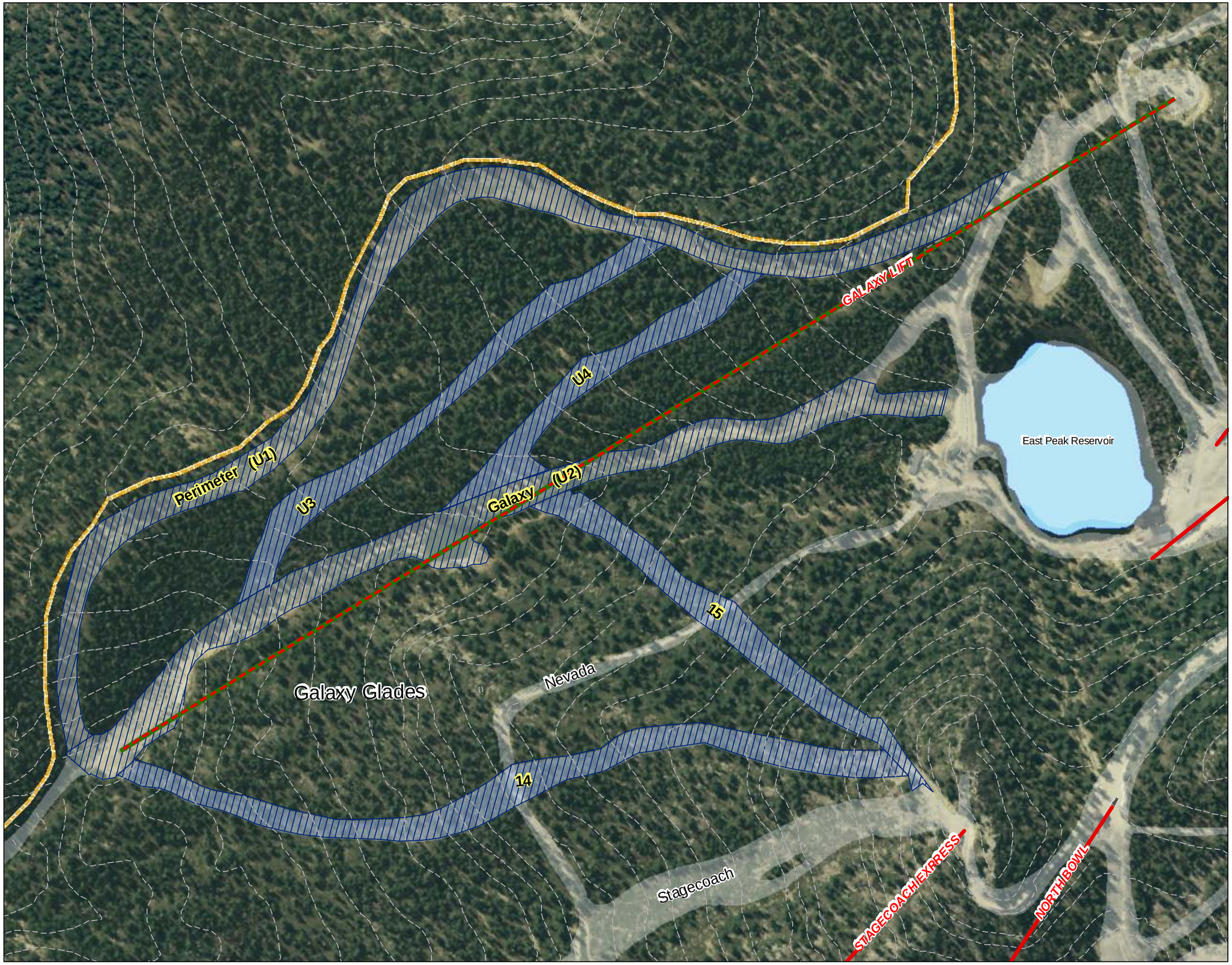
- Existing Lifts
- Existing ZipLine
- Relocated Lift
- Snowmaking/ Teaching Lift
- Removed Road
- ProposedRoad
- Proposed Delivery Road
- Existing Roads
- Existing Building
- Proposed ESRHR Treatment
- Proposed Gondola Lodge

Contour Interval: 50 Feet
Date: November 2009

1 inch = 300 feet

0 150 300 600 Feet

SE GROUP



Heavenly
LAKE TAHOE

2010 Capital Projects

Figure 3:
Galaxy Pod Vicinity

Legend

- Existing Lifts
- Proposed Lift
- Proposed Snowmaking
- Proposed ESRHR Treatment

Contour Interval: 50 Feet
Date: October 2009

1 inch = 400 feet

0 200 400 800 Feet

SE GROUP

Heavenly
LAKE TAHOE

2010 Capital Projects

Figure 4:
Relocated Umbrella Bar
to Snow Beach

Legend

- Relocated Umbrella Bar
- Existing Lifts
- Existing Snow Beach Facility

Contour Interval: 50 Feet
Date: November 2009

1 inch = 100 feet

0 50 100 200
Feet

SE GROUP

Appendix

APPENDIX A: SCOPING COMMENTS SUMMARY REPORT

INTRODUCTION

On November 30, 2009 a scoping notice was distributed for review and comment period. The scoping notice was mailed to individuals and organizations who had expressed interest in activities at Heavenly in the past. In addition, the scoping notice was posted on the LTBMU web site, and a news release ran in the Lake Tahoe Tribune. The notice provided details about the Proposed Project and invited comments from those interested in or affected by the Proposed Action. The scoping period closed on January 15. Twenty-three comment letters were received from five organizations/agencies and individuals. The comments and responses are available as part of the public record.

DEFINITIONS

Comments related to National Forest System Lands were placed into the following three groups:

- **Non-Significant Issues** do not meet the Purpose and Need for the project; are outside the scope of the proposed action; are already decided by law, regulation, or Forest Plan; are not supported by scientific evidence; are addressed by project design features; or are addressed by additional information or clarification of the proposed action. Non-issues also may represent opinions and statements which do not present problems or alternatives.

- **Issues considered but eliminated from detailed study** meet the Purpose and Need for the project but were considered in alternatives already studied and eliminated, or additional project design features were developed which reduced or eliminated the effects.

- **Issues** are relevant to the Purpose and Need for action in terms of the extent of the geographic distribution, the duration of effects, or the intensity of interest or resource conflict and therefore merit detailed analysis within the NEPA document and/or consideration for the development of an alternative to the proposed action.

The responses to scoping comments, below, reflect how public comments were considered and/or analyzed in the EA and decision documentation. All public comments were identified as **Non-Significant Issues**.

COMMENTS FROM THE LEAGUE TO SAVE LAKE TAHOE:

Vegetation

1. ***The Heavenly Mountain Resort Master Plan Amendment 2005 also mentions that California Trail is located within the headwaters of Heavenly Valley Creek (page 3.8-38), consequently, care should be taken not to damage riparian or sensitive plants in this area.***

The proposal to implement the Easy Street Run Hazard Reduction Prescription (ESRHRP) is proposed for the existing *California Trail* corridor. Because there are known populations of Tahoe draba (a Region 5 Sensitive plant species) on California Tail, the ESRHRP would only be implemented below occupied habitat. The lowest extent of occupied habitat would be demarcated on the ground to assist construction crews. Beyond avoidance measures, the EA will include best management practices (BMPs) to ensure that potential impacts to special status plant species are reduced or eliminated. No riparian vegetation is present in the vicinity of *Upper California Trail*.

2. ***The reduction of obstacles on California Trail may impact the sensitive plant, Draba asterophora v. asterophora. The Heavenly Mountain Resort Master Plan Amendment 2005 dated January 27, 2007 notes that the plants "may be vulnerable to any activity resulting in long-term habitat disturbance." Even with 100 foot buffer zones, hazard reduction on California Trail may result in long-term habitat disturbance.***

   See response to Comment #1.

Soils

3. ***Implementation of the Easy Street Run Hazard Reduction (ESRHR) as outlined by the 2007 Easy Street Run Hazard Reduction Monitoring Report may be improved before applying the prescription to California Trail. Since the ESRHR demonstration project was conducted, additional water quality monitoring and research have produced conclusions that can provide important adaptive management techniques. Some of this information has been outlined in the Heavenly Mountain Resort Restoration and Monitoring 2008 Summary Report within the Heavenly Mountain Resort Mitigation and Monitoring Plan Annual Report (October 2007–October 2008).***

   The ESRHR monitoring report notes the need for further research and monitoring of the ESRHR prescription applied to steeper slopes, the need for a Seasonal Runoff Evaluation, storm monitoring and long term monitoring. Much of the determinations about erosion and runoff came from visual assessments through "photo point monitoring," which examined the percentage of area covered with debris, organic matter, vegetation and rock. It might prove worthwhile to examine runoff produced by irrigating vegetation, if runoff exists between the soil and debris layers and if runoff is channeled by debris.

   The ESRHR Prescription has been modified and improved since its original application based on post-construction evaluations of Easy Street with TRPA and the Forest Service and on the following process.

   Post-construction monitoring has been conducted on three gladed trails that were constructed in 2007. These were new trails that were constructed similar to the ESRHRP; they were not retrofits of existing trails. Monitoring involves the use of cone penetrometers to measure changes to the infiltration capacity of the soils and use this data to simulate rainfall and erosional response. Effective soil cover, soil nutrient content and visible evidence of sediment transport are all measured pre- and post-construction.

This information is reported by the monitoring contractor—IERS—as part of the 2007/2008 TRPA-Forest Service Master Plan and Mitigation Monitoring Report.

Heavenly will conduct post-ESRHR Prescription implementation monitoring on the *California Trail*.

Finally, revegetation irrigation is monitored closely in the field by dedicated summer field crews who are trained to avoid erosion or visible soil movement.

Soils

4. ***Since the ESRHR monitoring report was released in 2007, additional scientific information about the likely increase in frequency of rain, rain-on-snow events and 100-year storms has become available. At the time of the ESRHR, WEPP simulations showed that erosion was mainly caused by snowmelt instead of rainfall and included 30-year and 20-year, one-hour storm simulations. Conclusions taken from additional monitoring and modeling taking into account greater storm intensity could be included in adaptive management methods.***

   Heavenly prepares an annual report that includes adaptive management suggestions from two monitoring teams.

Soils

5. ***The Proposed Action Description states that the lodge is being proposed to be located slightly southwest of the original location approved in the Master Plan Amendment. The proposed Action Description states that soil will be removed from a slope to construct the Gondola Lodge, moving the soil to level the area in front of Tamarack Express. Would this grading be necessary if the originally approved site was used? Since new soil will cover existing vegetation, will this area be re-vegetated?***

   The proposed Gondola Lodge would be approximately 400 feet north of the top terminal of the gondola. This was conceptually referred to as "Von Schmidt's Lodge" in the MPA 05, and was identified slightly northeast of the currently proposed location. Since the MPA 05 was accepted, Heavenly has completed a detailed site analysis of the entire Von Schmidt's area to identify the ideal location for the lodge. The proposed site optimizes circulation patterns and takes advantage of existing uses, activities, and views in the Adventure Peak area to better serve skiing and non-skiing resort visitors.

   The conceptual location for the new lodge identified in the MP05 would not have required as much grading as the currently proposed location. However, the location of the new lodge is irrelevant to the need to raise the elevation of the area immediately in front of the Tamarack Express. Once spoils from the Gondola Lodge construction are used to fill this depression, soil stabilization and revegetation will be done in accordance with Heavenly's revised Construction Erosion Reduction Program (CERP), as outlined in the MPA 07 and the 2007 Environmental Impact Statement ("EIS").

Land Coverage

6. ***The Proposed Action Description states that the Umbrella Bar will be relocated from the top of the Gondola to Snow Beach, next to Patsy's Hut. The Heavenly Mountain Resort Master Plan Amendment shows the allowable coverage for the area where the current Umbrella Bar is, as having a moderate erosion hazard (land capability class 4/7, 20% allowable coverage), but the area that coverage will be relocated to is considered to have a high erosion hazard (land capability class 1a, 1% allowable coverage) and appears to be located adjacent to Heavenly Valley Creek (Heavenly Master Plan Amendment Soil Classification Map 3.4-1 and Table 3.4-1 pages 3.4-2 to 3.4-5). It is important that when land coverage is transferred, it is completely restored and that restored state is maintained. It is also necessary to consider soil classification when transferring land coverage. In the case of transferring the Umbrella Bar and its coverage, an equal amount of coverage can only be used in areas having equal soil classification. Although the approved Master Plan allocated 2,274 square feet of coverage for Snow Beach, it is unclear from the proposed Action Description and accompanying maps what the total land coverage at Snow Beach is being proposed to be once the Umbrella Bar is moved.***

   Heavenly has verified, retired, and banked existing land coverage consistent with the TRPA Land Coverage Standards. Ample land coverage has been banked to accommodate relocation of the Umbrella Bar to Snow Beach.

   All portions of the ski area that are within the Lake Tahoe Basin (i.e., subject to TRPA jurisdiction), have been classified from a land capability standpoint as either land capability class 1a (most sensitive, not high erosion hazard) or class 1b (stream zone). Therefore, all land coverage that is to be relocated from Heavenly's banked land coverage (described above), is relocated based upon specific findings that TRPA makes relative to the sending site being equal or more sensitive to the receiving site. This relocation is conducted at a ratio of 1.5:1.

   As an example, if Heavenly has 100,000 square feet of banked land coverage and wants to use 10,000 square feet of it for a new building, then the land coverage "'account" is debited 15,000 square feet.

Land Coverage

7. ***The Heavenly Master Plan Amendment 2005 allows 10,450 square feet coverage for the Gondola Lodge (Appendix 2-A, page 1). The Proposed Action Description states that the Gondola Lodge will cover 14,750 square feet plus an additional 4,320 square foot patio, totaling 19,070 square feet. 4,250 square feet of coverage is being proposed to be re-allocated from the Sand Dunes Lodge. The Heavenly Mountain Resort Master Plan Amendment states that the Sand Dunes Lodge is located outside of the basin, so how is Heavenly allowed to transfer this coverage from outside the basin (page 3.4-19 and Land Coverage Table, Appendix 2-A)? From the total proposed coverage of 19,070 square feet, once the 4,250 square feet from the Sand Dunes lodge is subtracted (14,820 square feet left), there is still an additional 4,370 square feet proposed for the Gondola Lodge beyond the 10,450 square feet that has been approved through the Master Plan. Beyond this, where is the source for the additional 4,370 square feet needed for this project?***

   Land coverage for the proposed Gondola Lodge would be relocated from previous land coverage that has been retired from previous projects at Heavenly. The retired land coverage has been properly field-verified and "banked" by the TRPA (see response to Comment #6, above). This is further

discussed in Section 3.13 and Appendix 2 of the 2007 Master Plan and in Section 3.4 of the Master Plan EIS/EIS (Earth and Soils). Both the Master Plan and the EIR/EIS contemplated that all future projects requiring land coverage that are within the TRPA jurisdiction will make use of the relocated land coverage that has previously been banked.

As a part of approving the Gondola Lodge, TRPA will document the amount of banked land coverage that is available to relocate to the project.

COMMENTS FROM THE LAHONTAN REGIONAL BOARD

Hydrology

8. ***The Lahontan Basin Plan contains certain prohibitions on SEZ and flood plain disturbance, as well as restrictions on wetland impacts. Certain exemptions also apply. If the project has the potential to affect these resources, the project must meet the exemption criteria and be designed to avoid, minimize and/or mitigate for such impacts.***

   Construction of all proposed projects will be conducted in accordance with the revised Construction Erosion Reduction Program (CERP), as outlined in the 2007 Master Plan Amendment ("MP") and the 2007 Environmental Impact Statement ("EIS"). SEZs, flood plains, and wetlands would be avoided during construction.

Soils

9. ***Proponents of projects that involve land disturbance of 1 acre or greater are required to seek coverage under the General NPDES permit for storm water discharges associated with construction activity in the Lake Tahoe Hydrologic Unit… the Permit is being updated and new requirements may be applicable to your project.***

   Heavenly is fully prepared to prepare a stormwater management plan, as per the General NPDES permit, upon approval of ground disturbing projects in excess of one acre.

COMMENTS FROM THE NEVADA DIVISION OF WATER RESOURCES

Water Supply

10. ***Any water used for the described project on lands lying within the State of Nevada should be provided by an established utility or under permit issued by the State Engineer's Office. All waters of the State belong to the public and may be appropriated for beneficial use pursuant to the provisions of Chapters 533 and 534 of the Nevada Revised Statutes (NRS), and not otherwise. Any water or monitor wells, or boreholes that may be located on either acquired or transferred lands are the ultimate responsibility of the owner of the property at the time of the transfer and must be plugged and abandoned as required in Chapter 534 of the Nevada Administrative Code. If artesian water is encountered in any well or borehole it shall be controlled as required in NRS § 534.060(3).***

    Water that would be necessary for additional snowmaking coverage on existing/proposed trails in the Galaxy Pod, as well as on *California Trail*, is within existing terms, permits and rights.

COMMENTS FROM INDIVIDUALS (FORM LETTERS)

Climate Change

11. ***…due to climate change temperature increases and the resulting reduced snowpack in the Sierra Nevada Mountains, will make this business expansion of Heavenly Mountain Resort pointless.***

Heavenly's winter operations are dependent on climate conditions, and are highly susceptible to variations in weather patterns. It is possible that, in the future, Heavenly will find it necessary to place a greater emphasis on snowmaking in the early season, and perhaps throughout the year. However, these are not grounds to halt new project planning at the resort.

Water Quality

12. ***Dr. Charles R. Goldman of the U.C. Davis [Lake] Tahoe Basin Research Group has stated that even with the use of "erosion reduction practices," which are proposed in the Resort's business expansion plan for the development of this site, pollutants from streams and groundwater within the Resort's borders and at the proposed construction site will induce high levels of nutrients to be deposited in the Lake Tahoe.***

It is important to note that the majority of proposed ground- and vegetation-disturbing activities are outside of the Lake Tahoe Basin. Proposed in-Basin projects are: construction of the Gondola lodge, raising the elevation of the area immediately in front of the Tamarack lift, relocation of the Umbrella Bar to Snow Beach, and the ESRHRP on *California Trail*. Construction of all proposed projects will be conducted in accordance with the revised Construction Erosion Reduction Program (CERP), as outlined in the 2007 Master Plan Amendment ("MP") and the 2007 Environmental Impact Statement ("EIS").

Water Quality

13. ***With the estimated tripling of vehicular traffic that the expansion of the Resort will result in, the U.C. Davis [Lake] Tahoe Research Group estimates that this will result in increased levels of nitrogen, ozone, sulfuric acid, and other vehicular pollutants in Lake Tahoe.***

Per the 2007 EIR/EIS/EIS that analyzed Heavenly MPA 05, traffic volumes within the Lake Tahoe Basin, and especially on U.S. Highway 50, vary by season. Winter traffic volumes are typically lower than summer volumes. Generally, traffic is highest during mid-summer periods, especially around July 4th and during August. The ADT volumes during the peak month are 20 percent to 40 percent higher than the average volumes. Review of the peak month average daily traffic volumes (Caltrans) indicates that these volumes have also remained relatively constant over the same time period.[1]

In fact, the adopted 2008 TRPA Regional Transportation Plan (RTP, pages 14 and 15) shows that based on NDOT and CatTrans data, South Shore August traffic volumes in the US Highway 50 corridor have decreased by 20 percent since 1988 and that AADT has decreased by 23 percent.

[1] 2007 EIR/EIS/EIS page 3.7-5

The 2007 EIR/EIS/EIS determined that the MPA 05 would not increase peak hour traffic beyond the levels estimated in the approved 1996 Final EIR/EIS/EIS.[2] In fact, the MPA 05 peak hour trip generation estimate is lower than the 1996 Final EIR/EIS/EIS trip generation estimate by 466 total trips (490 total trips vs. 956 total trips, respectively).

Heavenly is a founding partner in the Coordinated Transportation System (CTS) Memorandum of Understanding (MOU) and Participation Agreement and is a leading operator of the CTS (now known as BlueGo). The purpose of the CTS MOU was to create a public/private partnership to mitigate traffic and air quality impacts by improving transit operations in the Lake Tahoe Basin. Heavenly continues to work implementing mitigation measures which discourage the use of automobiles.

Finally, the 2007 EIR/EIS/EIS analysis estimated that no new trips (and no significant increase in vehicle miles traveled) would be generated by implementation of the MPA 05—primarily due to Heavenly's continued efforts to decrease automobile trips in the Lake Tahoe Basin via expanded shuttle service, contributions to the CTS, and parking strategies. Therefore, as stated in the 2007 EIR/EIS/EIS, it is not expected that [the MPA 05] would create any additional transportation related air quality impacts beyond those identified in the 1996 EIR/EIS/EIS.[3]

Water Quality

14. ***Dr. Goldman estimates that in less than 30 years Lake Tahoe's famous clarity will be gone, unless current erosion and air pollution levels are reduced in the Lake Tahoe Basin. The Heavenly Mountain Resort's construction proposal will only accelerate both of these severe problems.***

See response to Comment #12.

Soils

15. ***The Resort's business expansion proposal also contains references to "reducing natural obstacles, including boulders and trees." The removal of these natural objects would only add to the erosion and pollution increases in the Lake Tahoe Basin.***

The Easy Street Run Hazard Reduction Prescription (ESRHRP) is proposed to be implemented on *California Trail*, as well as four new trails proposed within the Galaxy Pod. Originally proposed in 2004, the ESRHRP was designed to demonstrate an iterative, process-based approach for ski trail construction which balances the needs of ski area development and management with the protection of soil and water resources, while also decreasing dependency on snowmaking and associated resource use.

See response to Comment #3 for more information.

[2] 2007 EIR/EIS/EIS page 3.7-15
[3] 2007 EIR/EIS/EIS page 3.5-17