

3.8 VEGETATION

3.8-1 INTRODUCTION

The proposed Heavenly Mountain Resort Epic Discovery Project is contained within the boundaries of the existing Special Use Permit Area in accordance with the 2003 Forest Service's Lake Tahoe Basin Management Unit (Forest Service) special use permit approval. A delineation of this boundary can be located on Figure 1-1 in Chapter 1, Introduction and Purpose and Need. No expansion or modification of Heavenly's facilities is proposed outside of this Special Use Permit boundary. Impacts to vegetation resources are confined within the boundaries of this area. Much of the following information has been taken from the Draft and Final EIR/EIS/EIS (95 Draft and 96 Final EIR/EIS/EIS) documents prepared for the 1996 Heavenly Mountain Resort Master Plan (MP 96) and the 2007 FEIR/EIS/EIS prepared for the 2007 Master Plan Amendment and updated accordingly.

3.8-2 ENVIRONMENTAL AND REGULATORY SETTING

Sensitive Plant Species

A number of sensitive plant species have been recorded or have potential habitat within the Lake Tahoe Basin (Table 3.8-1). For the purposes of this document, these sensitive plant species are defined to include:

- Federally listed, proposed, and candidate threatened and endangered species (Federal Register 50 of Federal Regulations Part 17.11 and 17.12);
- Plants listed as sensitive in California (Region 5) by the United States Department of Agriculture, Forest Service (2013);
- Species officially listed as rare, threatened, and endangered by the State of California Endangered Species Act of 1984;
- Plants listed as rare, threatened, or endangered (California Rare Plant Rank) by the California Native Plant Society (2005);
- Species inventoried by the California Natural Diversity Database (CNDDDB), Nongame Heritage Program, California Department of Fish and Wildlife, April 2014;
- Plants listed as Sensitive Plants by the TRPA and for which the TRPA has established environmental thresholds based on a minimum number of population sites (Table 3.8-2).
- Plants listed as Critically Endangered by the Nevada Division of Forestry under Nevada Revised Statutes 527.260-.300.

Table 3.8-1

Sensitive Plant Species Evaluated for Epic Discovery Projects					
	Species	Status*	Habitat Characteristics	Known to occur in project area	Potential habitat in project area
1	<i>Arabis rigidissima</i> var. <i>demote</i> Galena Creek rockcress	S, 1B	Open, rocky areas along forest edges of conifer and/or aspen stands; usually found on north aspects; 7,500 ft. & above.	Y	Y
2	<i>Boecheera tiehmii</i> Tiehm rockcress	S, 1B	Open rocky soils in the Mt. Rose Wilderness; 10,000 ft. & above.	N	N
3	<i>Boecheera tularensis</i> Tulare rockcress	S, 1B	Shaded, mostly east-facing subalpine rocky areas, including rocky slopes, rock-lined streams and seeps, rocky outcrops, saddles, and canyons; 6,000-11,000 ft.	N	N
	<i>Botrychium</i> spp.		<i>Botrychium</i> species are found in similar habitat; wet or moist soils such as marshes, meadows, and along the edges of lakes and streams; generally occur with mosses, sedges, rushes, and other riparian vegetation; 2,000-10,000 ft.		
4	<i>Botrychium ascendens</i> Upswept moonwort	S, 2	See <i>Botrychium</i> spp.	N	Y
5	<i>Botrychium crenulatum</i> Scalloped moonwort	S, 2	See <i>Botrychium</i> spp.	N	Y
6	<i>Botrychium lineare</i> Slender moonwort	C, S, 1B	See <i>Botrychium</i> spp.	N	Y
7	<i>Botrychium lunaria</i> Common moonwort	S, 2	See <i>Botrychium</i> spp.	N	Y
8	<i>Botrychium manganense</i> Mingan moonwort	S, 2	See <i>Botrychium</i> spp.	N	Y
9	<i>Botrychium montanum</i> Mountain moonwort	S, 2	See <i>Botrychium</i> spp.	N	Y
10	<i>Bruchia bolanderi</i> Bolander's	S, 2	Mainly in montane meadows and stream banks, but also on bare, slightly eroding soil where	N	N

Table 3.8-1

Sensitive Plant Species Evaluated for Epic Discovery Projects					
	Species	Status*	Habitat Characteristics	Known to occur in project area	Potential habitat in project area
	candle moss		competition is minimal.		
11	<i>Dendrocollybia racemosa</i>	S	On old decayed or blackened mushrooms or occasionally in coniferous duff, usually within old growth stands.	N	Y
12	<i>Draba asterophora</i> var. <i>asterophora</i> Tahoe draba	S, SI, 1B	Rock crevices and open granite talus slopes on north-east slopes; 8,000-10,200 ft.	Y	Y
13	<i>Draba asterophora</i> var. <i>macrocarpa</i> Cup Lake draba	S, SI, 1B	Steep, gravelly or rocky slopes; 8,400-9,300 ft.	N	Y
14	<i>Draba cruciate</i> Mineral King draba		Subalpine gravelly or rocky slopes, ridges, crevices, cliff ledges, sink holes, boulder and small drainage edges; 7,800-13,000 ft.	N	Y
	<i>Epilobium howellii</i> Subalpine fireweed	1B	Wet meadows and mossy seeps in subalpine coniferous forest; 6,500-9,000 ft.	N	Y
15	<i>Erigeron miser</i>	S, 1B	Granitic rock outcrops; 6,000 ft. & above	N	Y
16	<i>Eriogonum luteolum</i> var. <i>saltuarium</i> Goldencarpet buckwheat	S	Sandy granitic flats and slopes, sagebrush communities, montane conifer woodlands; 5,600-7,400 ft.	N	N
17	<i>Eriogonum umbellatum</i> var. <i>torreyanum</i> Donner Pass buckwheat	S, 1B	Dry gravelly or stony sites; often on harsh exposures (e.g. ridge tops, steep slopes)	N	Y
18	<i>Helodium blandowii</i> Blandow's feather moss	S	Bogs, fens, wet meadows, and along streams under willows.	N	Y
19	<i>Hulsea brevifolia</i> Short leaved hulsea	S, 1B	Red fir forest, but also in mixed conifer forests; found on gravelly soils; 4,900- 8,900 ft.	N	Y
20	<i>Ivesia sericoleuca</i> Plumas ivesia	S	Associated with seasonally wet meadows, meadow ecotones, terraces and toeslopes on soils which are primarily volcanic in origin. The plant has not been located on granitic soils.	N	N
21	<i>Lewisia kelloggii</i> spp. <i>Hutchinsonii</i> Hutchinson's		Ridge tops or flat open spaces with widely spaced trees and sandy granitic to erosive volcanic soil; 5,000-7,000 ft.	N	Y

Table 3.8-1

Sensitive Plant Species Evaluated for Epic Discovery Projects					
	Species	Status*	Habitat Characteristics	Known to occur in project area	Potential habitat in project area
	lewisia				
22	<i>Lewisia kelloggii</i> <i>ssp. kelloggii</i> Kellogg's lewisia		Ridge tops or flat open spaces with widely spaced trees and sandy granitic to erosive volcanic soil; 5,000-7,000 ft.	N	Y
23	<i>Lewisia longipetala</i> long-petalled lewisia	S, SI, 1B	North-facing slopes and ridge tops where snow banks persist throughout the summer; often found near snow bank margins in wet soils; 8,000-12,500 ft.	N	N
24	<i>Meesia triquetra</i> Threeranked humptom	S, 2	Bogs and fens, but also very wet meadows.	N	N
	<i>Meesia uliginosa</i> Broadnerved humptom	, 2	Bogs and fens, but also very wet meadows.	N	N
25	<i>Orthotrichum praemorsum</i> Orthotrichum moss	S	Shaded, moist habitats of east side of Sierra Nevada rock outcrops; up to 8,200 ft.	N	N
26	<i>Peltigera gowardii</i> Western waterfan lichen	S	Cold unpolluted streams in mixed conifer forests.	N	Y
27	<i>Pinus albicaulis</i> Whitebark pine	S, C	Subalpine and at timberline on rocky, well-drained granitic or volcanic soils.	Y	Y
28	<i>Rorippa subumbellata</i> Tahoe yellowcress	C, S, SI, SE, 1B	Subalpine and at timberline on rocky, well-drained granitic or volcanic soils.	N	N

Source: USDA Forest Service, List of Sensitive Species of the LTBMU; Tahoe Regional Planning Agency, Environmental Thresholds. CNDDDB, May 2014;

* Status Codes:

List revised 2013

No species in LTBMU are currently listed as "Threatened or Endangered" by the U.S. Fish and Wildlife Service under ESA.

CRPR 1B, 2, 3 = Plants listed as rare, threatened or endangered in California and elsewhere by the California Native Plant Society. All of the plants on this list meet the definitions of Section 1901, Chapter 10 (Native Plant Protection) of the California Department of Fish and Game Code and are eligible for state listing.

C = USFWS Candidate species for listing as threatened or endangered under ESA

S = U.S. Forest Service LTBMU Sensitive Species, Regional Forester's Sensitive Species List, Amended 2013

SI = TRPA sensitive Species, Regional Plan for The LTBMU: Goals and Policies (1986) and Code of Ordinances (1987)

SE = State Endangered in California and/or Nevada

Federal Law

Endangered Species Act (16 USC 1531 et seq.): This EIR/EIS/EIS is being prepared in accordance with the Endangered Species Act of 1973 as amended (16 USC 1531 et seq.). Under this act, federal agencies must ensure that any action authorized, funded, or carried out by the agency is not likely to (a) jeopardize the continued existence of any listed species or (b) result in the destruction or adverse modification of a listed species' designated critical habitat. Section 7 of the act requires federal agencies to consult the U.S. Fish and Wildlife Service concerning listed (i.e. threatened or endangered) plant species that fall under their jurisdiction.

Forest Service Direction

Forest Service Manual, Section 2670 (USDA 2005): provides policy for the protection of sensitive species and calls for the development and implementation of management practices to ensure that species do not become threatened or endangered because of Forest Service actions. It requires a review of all activities or programs that are planned, funded, executed, or permitted for possible effects on federally listed or Forest Service sensitive species (FSM 2672.4, USDA 2005).

A Biological Evaluation (BE) provides the means to conduct this review (which has been prepared in conjunction with this EIR/EIS/EIS), analyze the significance of potential adverse effects, and determine how negative impacts will be minimized or avoided for those species whose viability has been identified as a concern. The objectives of a BE and the analysis in this EIR/EIS/EIS are to:

- ensure that Forest Service actions do not contribute to loss of viability of any native or desired nonnative plant or animal species;
- ensure that Forest Service actions do not jeopardize or adversely modify critical habitat of Federally listed species; and
- provide a process and standard through which rare plant species receive full consideration throughout the planning process, reducing negative impacts on species and enhancing opportunities for mitigation.

Regional and Forest Plan Direction

Sierra Nevada Forest Plan Amendment (SNFPA) Final Supplemental Environmental Impact Statement (USDA 2004): establishes standards and guidelines pertaining to the protection and consideration of sensitive plants, including conducting field surveys, minimizing or eliminating direct and indirect impacts from management activities, and adhering to the Regional Native Plant Policy (USDA 1994).

Tahoe Regional Planning Agency (TRPA) Code of Ordinances (TRPA 2012): directs the agency to conserve threatened, endangered, and sensitive plant species and uncommon plant communities and delineates five plant species as sensitive: *Rorippa subumbellata* (Tahoe yellow cress); *Arabis rigidissima* var. *demota* (Galena Creek rock cress); *Lewisia longipetala* (long-petaled Lewisia); *Draba asterophora* v. *macrocarpa* (Cup Lake draba); and *Draba asterophora* v. *asterophora* (Tahoe draba). Projects and activities in the vicinity of sensitive plants and their

associated habitat that are likely harm, destroy or otherwise jeopardize plants or habitat are prohibited, unless their significant adverse effects are fully mitigated.

LTBMU Land Resource Management Plan (LRMP) (USDA 1988): directs the LTBMU to manage the viability of sensitive botanical species and to ensure that these species do not become threatened or endangered because of Forest Service activities. The primary purpose of the direction is to assure that existing habitat of these species is adequately protected and that additional habitat is provided to perpetuate the species. This direction implements the protections legislated in the National Forest Management Act and the Endangered Species Act.

Detailed species accounts which describe the known range, habitat requirements, and local occurrence data for each sensitive plant species known to occur or potentially occur in the Heavenly Mountain Resort Epic Discovery project area are included in the Epic Discovery Projects Biological Evaluation on file at the Lake Tahoe Basin Management Unit.

3.8-3 EVALUATION CRITERIA

An environmental impact is defined as a change in the existing environmental conditions. For the purpose of this document, an impact is considered significant if it does not comply with the Goals, Policies, and Ordinances of the TRPA Regional Plan, exceeds TRPA Environmental Thresholds, or meets the criteria for a significant effect as defined by the State CEQA Guidelines or the National Environmental Policy Act. The applicable TRPA, CEQA, and NEPA significance criteria are provided below.

Tahoe Regional Planning Agency

TRPA Environmental Thresholds

The TRPA has established environmental thresholds for common vegetation (including richness, relative abundance, and pattern), uncommon plant communities, and sensitive plants. These environmental thresholds are used to establish the significance of an environmental effect to vegetation resources in the Lake Tahoe Basin. TRPA environmental thresholds for vegetation resources are defined below.

Common Vegetation

Increase plant and structural diversity of forest communities through appropriate management practices as measured by diversity indices of species richness, relative abundance, and pattern.

Richness

Maintain the existing species richness of the basin by providing for the perpetuation of the following plant associations:

Yellow Pine Forest: Jeffrey pine, white fir, incense cedar, sugar pine.

Red Fir Forest: red fir, Jeffrey pine, lodgepole pine, western white pine, mountain hemlock, western juniper.

Subalpine Forest: whitebark pine, mountain hemlock, mountain mahogany.

Shrub Associations: greenleaf and pinemat manzanita, tobacco brush, Sierra chinquapin, huckleberry oak, mountain whitethorn.

Sagebrush Scrub Vegetation: basin sagebrush, bitterbrush, Douglas chamise.

Deciduous Riparian: quaking aspen, mountain alder, black cottonwood, willow.

Meadow Association (wet and dry meadow): mountain squirrel tail, alpine gentian, whorled penstemon, asters, fescues, mountain brome, corn lilies, mountain bentgrass, hairgrass, marsh marigold, elephant heads, tinker's penney, mountain Timothy, sedges, rushes, buttercups.

Wetland Associations (marsh vegetation): Pond lilies, buckbean, mare's tail, pondweed, common bladderwort, bottle sedge, common spikerush.

Cushion Plant Association (alpine scrub): Alpine phlox, dwarf ragwort, Draba.

Relative Abundance

Of the total amount of undisturbed vegetation in the Lake Tahoe Basin:

- Maintain at least 4 percent meadow and wetland vegetation.
- Maintain at least 4 percent deciduous riparian vegetation.
- Maintain no more than 25 percent dominant shrub association vegetation.
- Maintain 15-25 percent of the Yellow Pine Forest in seral stages other than mature.
- Maintain 15-25 percent of the Red Fir Forest in seral stages other than mature.

Pattern

Provide for the proper juxtaposition of vegetation communities and age classes by:

- Limiting acreage size of new forest openings to no more than eight acres.
- Adjacent openings shall not be of the same relative age class or successional stage to avoid uniformity in stand composition and age.

A non-degradation standard to preserve plant communities shall apply to native deciduous trees, wetlands, and meadows while providing for opportunities to increase the acreage of such riparian associations to be consistent with the SEZ threshold.

Native vegetation shall be maintained at a maximum level to be consistent with the limits defined in the Land Capability Classification of the Lake Tahoe Basin, California-Nevada, A Guide for Planning, Bailey, 1974, for allowable impervious cover and permanent site disturbance.

Uncommon Plant Communities

Provide for the non-degradation of the natural qualities of any plant community uncommon to the Tahoe Basin or of exceptional scientific, ecological, or scenic value.

This threshold shall apply but not be limited to:

1. The deepwater plants of Lake Tahoe;
2. Grass Lake (sphagnum bog);
3. Osgood swamp; and
4. the Freel Peak Cushion Plant community.

Sensitive Plants

Maintain a minimum number of population sites for each of the sensitive plant species identified in Table 3.8-2.

Table 3.8-2

TRPA Sensitive Plants

Species	Number of Population Sites
<i>Draba asterophora</i> var. <i>asterophora</i>	5
<i>Draba asterophora</i> var. <i>macrocarpa</i>	2
<i>Lewisia longipetala</i>	2
<i>Rorippa subumbellata</i>	26

Source: TRPA

TRPA Goals and Policies - Conservation Element - Vegetation

GOAL VEG-1: PROVIDE FOR A WIDE MIX AND INCREASED DIVERSITY OF PLANT COMMUNITIES IN THE TAHOE REGION.

The natural succession of vegetation in the Region has been stifled over the past 130 years. Following clear cut activities in the late 1800s, the forest vegetation has been managed under wildfire exclusion policies. The resulting lack of naturally occurring fires and other natural

perturbations has created an unnatural forest structure with regard to forest health and diversity. Extensive and overstocked stands of second growth conifers now dominate the forest vegetation. Other plant communities that require openings in the forest canopy are relatively scarce. The resulting situation is one of low plant diversity, poor age class structure, vulnerability to disease and pest organisms and increased risk of catastrophic wildfire. The preservation of the Region's vegetation and the achievement of environmental thresholds require programs that preserve or protect certain plant communities and species while permitting increased opportunities to manage the vegetation for diversity, fire prevention, and health. Attainment of these thresholds requires an on-going program involving harvest of fire fuels, revegetation, and vegetation manipulation.

POLICIES:

1. VEG-1.1 FOREST MANAGEMENT PRACTICES SHALL BE ALLOWED WHEN CONSISTENT WITH ACCEPTABLE STRATEGIES FOR THE MAINTENANCE AND ENHANCEMENT OF FOREST HEALTH AND DIVERSITY, PREVENTION OF WILDFIRE, PROTECTION OF WATER QUALITY, AND ENHANCEMENT OF WILDLIFE HABITATS.

Forest management practices that may include both timber harvest and pre-scribed burning are acceptable strategies for restoring and maintaining the biological health of the forest ecosystem. This policy would also permit practices necessary to reduce the risk of catastrophic wildfires.

2. VEG-1.2 OPPORTUNITIES TO IMPROVE THE AGE STRUCTURE OF THE PINE AND FIR PLANT COMMUNITIES SHALL BE ENCOURAGED WHEN CONSISTENT WITH OTHER ENVIRONMENTAL CONSIDERATIONS.

The conifer forests of the Tahoe Region are mostly even-aged. This has serious implications related to plant diversity and forest health. Opportunities to increase the ratio of young trees to mature trees should be encouraged.

3. VEG-1.3 FOREST PATTERN SHALL BE MANIPULATED WHENEVER APPROPRIATE AS GUIDED BY THE SIZE AND DISTRIBUTION OF FOREST OPENINGS.

Extensive stands of even-aged timber predominate in the Tahoe Region. Openings in these stands are uncommon. The forest pattern and resultant plant diversity can be improved through forest management practices that open-up the forest canopy to increase the proportion of shrub and meadow communities.

4. VEG-1.4 EDGE ZONES BETWEEN ADJACENT PLANT COMMUNITIES SHALL BE MAXIMIZED AND TREATED FOR THEIR SPECIAL VALUE RELATIVE TO PLANT DIVERSITY AND WILDLIFE HABITAT.

The mixing of two plant communities creates a zone of high plant diversity and provides an effective screen between adjacent land uses. Besides the benefit of increased plant diversity, edge zones provide critical habitats to many species of wildlife.

5. VEG-1.5 PERMANENT DISTURBANCE OR UNNECESSARY ALTERATION OF NATURAL VEGETATION ASSOCIATED WITH DEVELOPMENT ACTIVITIES SHALL NOT EXCEED THE APPROVED BOUNDARIES (OR FOOTPRINTS) OF THE BUILDING,

DRIVEWAY, OR PARKING STRUCTURES, OR THAT WHICH IS NECESSARY TO REDUCE THE RISK OF FIRE OR EROSION.

Protecting the existing vegetation around a construction site will aid in preventing soil compaction or disturbance due to equipment and human trampling. It will also reduce the need for revegetation and landscaping.

6. VEG-1.6 THE MANAGEMENT OF VEGETATION IN URBAN AREAS SHALL BE IN ACCORDANCE WITH THE POLICIES OF THIS PLAN AND SHALL INCLUDE PROVISIONS THAT ALLOW FOR THE PERPETUATION OF THE NATURAL-APPEARING LANDSCAPE.

The beauty of the Tahoe Region depends, in part, on the successful "blending" of the natural environment with the built environment. Vegetation in urban areas shall be preserved to the maximum extent feasible so as to avoid sharp contrasts between the urban and non-urban portions of the Region. Conditions of project approval for all grading, harvesting, landscaping, and other project proposals shall be required, as necessary, to implement the intent of this policy.

7. VEG-1.7 MAINTAIN FOREST LITTER FOR ITS EROSION CONTROL AND NUTRIENT CYCLING FUNCTIONS IN NATURALLY-VEGETATED AREAS EXCEPT TO THE EXTENT IT POSES A FIRE HAZARD.

The fungi associated with decaying plant material act as nutrient "sinks" by picking up plant nutrients that would otherwise be lost to adjacent water bodies during spring runoff.

8. VEG-1.8 PROMOTE USE OF NATIVE, WATER-EFFICIENT, NUTRIENT-EFFICIENT, FIRE- RESISTANT AND NON-INVASIVE VEGETATION IN URBAN AREAS AND DURING REVEGETATION OF DISTURBED SITES.

Native plants are adapted to the special altitude, climate, and soil characteristics of the Region. Use of non-native species often requires constant care and artificial amounts of water and fertilizer. Revegetation of disturbed sites will require the use of native plants whenever practical, but other approved species also may be appropriate.

9. VEG-1.9 ALL PROPOSED ACTIONS SHALL CONSIDER THE CUMULATIVE IMPACT OF VEGETATION REMOVAL WITH RESPECT TO PLANT DIVERSITY AND ABUNDANCE, WILDLIFE HABITAT AND MOVEMENT, SOIL PRODUCTIVITY AND STABILITY, AND WATER QUALITY AND QUANTITY.

The piecemeal and incremental removal of vegetation may have significant cumulative impacts on the natural resource values of the Region. Project review should consider both the direct and indirect impacts of all development, as well as fire safety.

10. VEG-1.10 WORK TO ERADICATE AND PREVENT THE SPREAD OF INVASIVE SPECIES.
11. VEG-1.11 ENCOURAGE LOCAL GOVERNMENTS TO DEVELOP URBAN FORESTRY COMPONENTS WITHIN THEIR AREA PLANS. URBAN FORESTRY PROGRAMS SHOULD SEEK TO REESTABLISH NATURAL FOREST CONDITIONS IN A MANNER THAT DOES NOT INCREASE THE RISK OF CATASTROPHIC WILDFIRE.

GOAL VEG-2: PROVIDE FOR THE PROTECTION, MAINTENANCE AND RESTORATION OF SUCH UNIQUE ECO-SYSTEMS AS WETLANDS, MEADOWS, AND OTHER RIPARIAN VEGETATION.

Riparian vegetation is a critical component of the Tahoe Region's natural vegetation. These communities serve a variety of useful functions especially related to water quality and quantity. Riparian plant communities also significantly contribute to plant and animal diversity, recreation, and scenic quality. Strategies to protect these qualities are developed within the framework of adopted environmental thresholds for soils, vegetation, and wildlife.

POLICIES:

1. VEG-2.1 RIPARIAN PLANT COMMUNITIES SHALL BE MANAGED FOR THE BENEFICIAL USES OF PASSIVE RECREATION, GROUNDWATER RECHARGE, AND NUTRIENT CATCHMENT, AND AS WILDLIFE HABITATS.

The preservation of riparian zones in their natural states should be emphasized over more intensive uses. These plant communities serve a variety of natural functions that benefit the scenic, wildlife, and water resources of the Tahoe Region.

2. VEG-2.2 RIPARIAN PLANT COMMUNITIES SHALL BE RESTORED OR EXPANDED WHENEVER AND WHEREVER POSSIBLE. WHEN COMPLETE RESTORATION IS NOT FEASIBLE, RESTORATION PROGRAMS SHALL FOCUS ON RESTORING THE NATURAL FUNCTION OF RIPARIAN AREAS TO THE GREATEST EXTENT PRACTICAL.

Riparian plant communities are the single most important habitat for wildlife in the Region and provide the most cost-effective means of water cleansing. Existing functioning riparian plant communities shall be maintained in their natural conditions to promote such beneficial functions. The schedule for restoration, as required by the thresholds, will correspond to the schedule for restoring Stream Environment Zones outlined in the Environmental Improvement Program.

GOAL VEG-3: CONSERVE THREATENED, ENDANGERED, AND SENSITIVE PLANT SPECIES AND UNCOMMON PLANT COMMUNITIES OF THE LAKE TAHOE REGION.

A few examples of rare plants and uncommon plant communities can be found in the Lake Tahoe Region. These resources are a real part of the Region's natural endowment and need to be protected from indiscriminant loss or destruction. Otherwise, the danger of extinction can become a reality. Direction for preservation is provided by adopted environmental thresholds.

POLICIES:

1. VEG-3.1 UNCOMMON PLANT COMMUNITIES SHALL BE IDENTIFIED AND PROTECTED FOR THEIR NATURAL VALUES.

Rare examples of Lake Tahoe's natural vegetation should be preserved for their ecological and local significance. Indiscriminate loss of uncommon plant communities shall be avoided. This policy applies specifically to those plant communities for which thresholds were adopted, but also may be extended to other communities later identified as significant by TRPA in cooperation with resource agencies. Attainment of the vegetation thresholds and implementation of this policy require close cooperation between this Agency and other agencies responsible for the protection and management of the Region's natural resources.

2. VEG-3.2 THE POPULATION SITES AND CRITICAL HABITAT OF ALL SENSITIVE PLANT SPECIES IN THE LAKE TAHOE REGION SHALL BE IDENTIFIED AND PRESERVED.

The Tahoe Region provides a favorable habitat for a few species of exceptionally scarce plants. Without proper protection, these sensitive plants may become extinct. Monitoring and evaluation programs will be necessary, in cooperation with the U.S. Forest Service and other interested agencies and individuals, to implement this policy.

3. VEG-3.3 THE CONSERVATION STRATEGY FOR TAHOE YELLOW CRESS IN THE LAKE TAHOE REGION SHALL FOSTER STEWARDSHIP FOR THIS SPECIES BY:
1. Providing education to landowners;
 2. Providing technical and planning assistance to landowners with Tahoe Yellow Cress to develop stewardship plans;
 3. Streamlining the Tahoe Yellow Cress project review process, while protecting the species and its habitat; and
 4. Support propagation efforts.

TRPA Late Seral/Old Growth Threshold

This threshold requires that 7,600 acres in the subalpine zone, 45,900 acres in the upper montane zone, and 30,600 acres in the montane zone shall be in a late seral/old growth condition.

The thresholds for late seral/ old growth ecosystems are as follows:

Attain and maintain a minimum percentage of 55 percent by area of forested lands within the Tahoe Region in a late seral or old growth condition, and distributed across elevation zones. To achieve the 55 percent, the elevation zones shall contribute as follows:

- The Subalpine zone (greater than 8,500 feet elevation) will contribute 5 percent (7,600 acres) of the forested lands;
- The Upper Montane zone (between 7,000 and 8,500 feet elevation) will contribute 30 percent (45,900 acres) of forested lands;
- The Montane zone (lower than 7,000 feet elevation) will contribute 20 percent (30,600 acres) of forested lands.

Forested lands within TRPA designated urban areas are excluded in the calculation for threshold attainment. Areas of the montane zone within 1,250 feet of urban areas may be

included in the calculation for threshold attainment if the area is actively being managed for late seral and old growth conditions and has been mapped by TRPA. A maximum value of 40 percent of the lands within 1,250 feet of urban areas may be included in the calculation. Because of these restrictions the following percentage of each elevation zone must be attained to achieve this threshold:

- 61 percent of the Subalpine zone must be in a late seral or old growth condition;
- 60 percent of the Upper Montane zone must be in a late seral or old growth condition;
- 48 percent of the Montane zone must be in a late seral or old growth condition.

Goal #4 Provide for and Increase the Amount of Late Seral/Old Growth Stands within the Lake Tahoe Basin.

Late seral/old growth forest stands are rare in the basin, but provide high quality habitat for many wildlife and plant species. In the year 2000, it was estimated that less than 5 percent of the forest stands could be conservatively classified as late seral/old growth. The desired future condition for forested land within the Tahoe Basin is that the forests should reflect the pre-settlement conditions to the degree possible. The best available estimate of the amount of late seral/old growth forest in pre-settlement times is 55 percent of the total forest. With the existing state of the basin's forest dominated by mature, even aged stands, active management is necessary to increase the amount of late seral/old growth forest.

POLICIES

- 4.1. STANDS EXHIBITING LATE SERAL/OLD GROWTH CHARACTERISTICS SHALL BE MANAGED TO ALLOW THESE STANDS TO SUSTAIN THESE CONDITIONS.**
The existing forest stands that exhibit late seral/old growth characteristics are rare in the basin and should be protected. These stands act as a refuge for late seral/old growth species and will be critical for future restoration of additional late seral/old growth stands.
- 4.2. STANDS NOT EXHIBITING LATE SERAL/OLD GROWTH CHARACTERISTICS SHALL BE MANAGED TO PROGRESS TOWARDS LATE SERAL/OLD GROWTH.**
Forest stands that do not currently exhibit late seral/old growth characteristics, and that can reasonably be expected to produce late seral/old growth characteristics, should be managed to move the stand towards increasing late seral/old growth characteristics. Active management is the primary vehicle for producing the desired future conditions. Management may entail thinning of smaller trees, alteration of the species composition, and other ecosystem manipulations.
- 4.3. PRESCRIPTIONS FOR TREATING THESE STANDS WILL BE PREPARED ON A STAND-BY-STAND BASIS. EACH PRESCRIPTION WILL DEMONSTRATE/EXPLAIN HOW IT WILL PROMOTE LATE SERAL OR OLD GROWTH CHARACTERISTICS PRIOR TO APPLYING ANY MECHANICAL TREATMENT OR PRESCRIBED FIRE. STAND-SPECIFIC PRESCRIPTIONS WILL BE DEVELOPED USING THE BEST AVAILABLE FOREST AND ECOSYSTEM MANAGEMENT SCIENCE, STRATEGIES, STANDARDS AND GUIDELINES.**

Late seral/old growth forest management applies best available scientific information to identify valued characteristics of late seral/old growth forests, and to manage for these characteristics. Site capabilities, habitat requirements of old growth-associated wildlife species, forest science including silviculture, and available information on general and site-specific pre-settlement forest structures and patterns provide guidance to site-specific management. The *Sierra Nevada Ecosystem Project Report* (2000), the *Lake Tahoe Watershed Assessment* (December 2000), and the Sierra Nevada Forest Plan Amendment (January 2001), apply scientific and forest management literature to identify important late seral/old growth forest characteristics. These documents also provide examples of management strategies, standards and guidelines for promoting these characteristics.

4.4. RETAIN LARGE TREES AS A PRINCIPAL COMPONENT OF LATE SERAL/OLD GROWTH ECOSYSTEMS.

Large trees are one of the defining components of late seral/old growth ecosystems. Without large trees present a forest stand cannot be classified as late seral/old growth. Many of the other components of late seral/old growth ecosystems are derived from large trees, including snags, down woody material, and soil conditions. The retention of large trees is a critical management strategy to achieve the late seral/old growth threshold.

4.5. RETAIN TREES OF MEDIUM AND SMALL SIZE SUFFICIENT TO PROVIDE FOR LARGE TREE RECRUITMENT OVER TIME, AND TO PROVIDE STRUCTURAL DIVERSITY. PREFERABLY, THESE TREES WILL BE THE MOST VIGOROUS IN THE STAND USING ONE OF THE STANDARD TREE CLASSIFICATIONS. IN ADDITION, SPECIES COMPOSITION SHOULD BE KEY CONSIDERATION IN TREE RETENTION.

The forests of the Lake Tahoe Region are largely even-aged as a result of forest regeneration after logging followed by discovery of the Comstock Lode. The large trees of today have finite life spans, and must eventually be replaced. Additionally, appropriate diversity of small, medium and large trees provides vertical structural diversity for wildlife. Tree species composition is an important characteristic of forests, affecting wildlife uses and forest health. Promoting and perpetuating late seral/old growth forest conditions require the future provision for a desired species composition, now and the future. Prior to settlement, natural events provided a well-adapted species mix. Today, forest planning for future conditions is needed because humans have changed the balance of forces operating in the forest that would produce the desired future condition for the forest.

4.6. USE OF PRESCRIBED FIRE IS PREFERRED TO REDUCE FIRE HAZARD AND PERPETUATE DESIRED NATURAL ECOLOGICAL PROCESSES. MANUAL AND MECHANICAL TREATMENT MAY BE USED TO REDUCE FOREST FUEL LEVELS AND TO IMPROVE LATE SERAL FOREST CONDITIONS IN ADDITION TO, OR IN LIEU OF, PRESCRIBED FIRE.

Fire is an effective and efficient tool to reduce forest fuels and thus fire risk. Additionally, fire is a natural ecological process that historically shaped the distribution and structure of vegetation and wildlife communities in the Sierra Nevada and Lake Tahoe basin. Use of prescribed fire or mechanical treatment to control and reduce forest fuel buildup will benefit forested communities by reducing the potential for catastrophic stand replacing fire events.

TRPA Code of Ordinances, Chapter 61 – Vegetation and Forest Health

61.3.6.C: Sensitive Plants and Uncommon Plant Communities. Designation of plants for special significance is based on such values as scarcity and uniqueness. The following standards shall apply to all sensitive plants and uncommon plant communities referenced in the environmental thresholds, and to other plants or plant communities identified later for such distinction. The general locations of sensitive plant habitat and uncommon plant communities are depicted on the TRPA Special Species map overlay.

1. Sensitive Plants

a. List of Sensitive Plants

The sensitive plants are:

- (i) *Rorippa subumbellata* (Tahoe yellow cress);
- (ii) *Arabis rigidissima* var. *demote* (Galena Creek rock cress); (iii) *Lewisia longipetala* (long-petaled lewisia);
- (iv) *Draba asterophora* v. *macrocarpa* (Cup Lake draba); and (v) *Draba asterophora* v. *asterophora* (Tahoe draba).

- b. Standards for Sensitive Plants Projects and activities in the vicinity of sensitive plants or their associated habitat shall be regulated to preserve sensitive plants and their habitat. All projects or activities that are likely to harm, destroy, or otherwise jeopardize sensitive plants or their habitat shall fully mitigate their significant adverse effects. Projects and activities that cannot fully mitigate their significant adverse effects are prohibited. Measures to protect sensitive plants and their habitat include, but are not limited to:

- (i) Fencing to enclose individual populations or habitat;
- (ii) Restrictions on access or intensity of use;
- (iii) Modifications to project design as necessary to avoid adverse impacts;
- (iv) Dedication of open space to include entire areas of suitable habitat; or
- (v) Restoration of disturbed habitat.

2. Uncommon Plant Communities

a. List of Uncommon Plant Communities

The uncommon plant communities are:

- (i) The deep water plants of Lake Tahoe, Grass Lake (sphagnum fen); (ii) Osgood Swamp, Hell Hole (sphagnum fen);
- (iii) Pope Marsh, Taylor Creek Marsh, Upper Truckee Marsh; and (iv) The Freel Peak cushion plant community.

b. Standards for Uncommon Plant Communities

Uncommon plant communities shall be managed and protected to preserve their unique ecological attributes and other associated values. Projects and activities that significantly adversely impact uncommon plant communities, such that normal ecological functions or natural qualities of the community are impaired, shall not be approved.

California Environmental Quality Act

Appendix G of the State CEQA Guidelines states that a significant effect would occur if:

- a project will substantially affect a rare, threatened or endangered plant or animal species or the habitat of the species;
- the project would adversely affect significant riparian, wetlands, marshes, or other wildlife habitat;
- the project would adversely affect a locally designated species or natural community; or
- the project would result in a barrier to wildlife dispersal or mitigation corridors.

For the purposes of this document, rare or endangered species are defined by Section 15380 of the State CEQA Guidelines as follows:

- "Endangered" when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, competition, disease, or other factors; or
- "Rare" when either:
 1. Although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or
 2. The species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as that term is used in the Federal Endangered Species Act.
- A species of plant shall be presumed to be rare or endangered as it is listed in:
 1. Title 14, California Administrative Code Sections 670.2 or 670.5, pursuant to the California Endangered Species Act or the California Native Plant Protection Act as rare, threatened or endangered.
 2. Title 50, Code of Federal Regulations Sections 17.11 or 17.12 pursuant to the Federal Endangered Species Act as rare, threatened, or endangered.
- A species not included in any listing identified above shall nevertheless be considered to be rare or endangered if the species can be shown to meet the criteria associated with "Endangered" or "Rare" species.

National Environmental Policy Act

Pursuant to the U.S. Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA), the significance of an effect on the quality of the human environment is determined by considering the context in which it would occur and the intensity of the action. "Context" refers to the affected region and locality in which the action would occur. Significance, therefore, varies depending on the setting of the proposed action. "Intensity" refers to the severity of the impact. In determining the intensity of an impact to plants or vegetation communities, the following factors should be considered:

Unique Characteristics: An action which affects unique characteristics of the geographical area, such as wetlands and ecologically critical areas, would be considered to have a significant effect on the human environment.

Special-status Species: An action which adversely affects an endangered or threatened species or its habitat would be considered to have a significant effect on the human environment.

California Fish and Game Code Native Plant Protection Policy

The goals of the Chapter 10 of the California Native Plant Protection Policy are as follows:

The intent of the Legislature and the purpose of this chapter are to preserve, protect, and enhance endangered or rare plants of this state (Section 1900). For purposes of this Chapter, a 'native plant' means a plant that grows in a wild uncultivated state, which is normally found native to the plant life of this state (Section 1901).

No person shall import into this state, or take, possess, or sell within this state, except as incident to the possession or sale of the real property on which the plant is growing, any native plant, or any part or product thereof, that the commission determines to be an endangered native plant or a rare native plant, except as otherwise provided in this chapter (Section 1908).

All state departments and agencies shall, in consultation with the department, utilize their authority in furtherance of the purposes of this chapter by carrying out programs for the conservation of endangered or rare native plants. Such programs include, but are not limited to, the identification, delineation, and protection of habitat critical to the continued survival of endangered or rare native plants (Section 1911).

Sierra Nevada Forest Plan Amendment

The Record of Decision for the Final Supplemental Environmental Impact Statement outlines management Goals and Strategies for Old Forest, Meadow, and Riparian Ecosystems. For a discussion of Riparian and Meadow Goals and Strategies, please refer to VEG-5 which outlines the Riparian Conservation Objectives and desired conditions. Management Goals for Old Forest Ecosystems are as follows:

- The broad goals of the old forest and associated species conservation strategy are to:
- Protect, increase, and perpetuate desired conditions of old forest ecosystems and conserve species associated with these ecosystems while meeting people’s needs for commodities and outdoor recreation activities;
- Increase the frequency of large trees, increase structural diversity of vegetation, and improve the continuity and distribution of old forests across the landscape; and
- Restore forest species composition and structure following large scale, stand-replacing disturbance events.

Invasive Plants

Invasive plants are a growing concern within the Sierra Nevada, as they are able to rapidly reproduce and spread, thereby invading and out competing native vegetation. The Forest Service defines invasive plants as plants designated as noxious by Federal or State law. Characteristics of invasive plants include: aggressive and difficult to manage, poisonous, toxic, parasitic, generally non-native, and a carrier or host of serious insects or disease. Invasive plants can create detrimental effects on vegetation, soil, wildlife, riparian areas, and recreational opportunities, among others.

To combat the spread of invasive plants, the Sierra Nevada Forest Plan Amendment requires a noxious weed risk assessment for any ground disturbing activities.

Sierra Nevada Forest Plan Amendment (USDA 2004)—Establishes goals, standards, and guidelines for invasive plant (noxious weed) management for the Sierra Nevada forests. It emphasizes prevention and integrated weed management. It establishes the following invasive plant management prioritization: 1) prevent the introduction of new invaders; 2) conduct early treatment of new infestations; 3) contain and control established infestations. It also requires forests to conduct an invasive plant risk assessment to determine risks for weed spread (high, moderate, or low) associated with different types of proposed management activities and develop mitigation measures for high and moderate risk activities with reference to the weed prevention practices in the Regional Noxious Weed Management Strategy.

Forest Plan Direction

Forest-wide direction is provided in the Forest Service Land and Resource Management Plan (LRMP), which states that the forest must “...manage sensitive plants to ensure that species do not become threatened or endangered because of Forest Service activities. The primary purpose is to assure that existing habitat of these plants is adequately protected and that additional habitat is provided to perpetuate the species.” (USDA 1988). The current management direction for Heavenly Mountain Resort is found in the LRMP under the Heavenly Valley Management Area. This area has been designated for alpine skiing and maintenance.

Table 3.8-3

Evaluation Criteria and Points of Significance - Vegetation

Evaluation Criteria	As Measured By	Point of Significance	Justification
1. Would the Project increase the risk of introduction or spread of invasive plants (aquatic or terrestrial)?	Abundance, habitat vulnerability, vectors not associated with Project, vectors associated with Project, prevention measures, habitat alteration	Introduction of new invasive plants and/or spread of existing invasive plant species	FSM2900—Invasive Species SNFPLA 2004 ROD, Appendix A, Noxious weed direction FSM 2070—Vegetation Ecology Invasive plant resource assessment template LTBMU Forest Plan
2. Would the Project result in an overall decrease in long term trends in Tahoe draba populations within the Project area?	a. Acres of draba occurrences b. Acres of suitable habitat	a. Greater than 0 acres b. Greater than 0 acres	TRPA Threshold Carrying Capacities (Resolution # 82-11) TRPA Code of Ordinances Chapter 61.3.6.A FESA CESA (Sections 2062 and 2067) CEQA (Article 5, Section 15065) California Native Plant Protection Act (CDFG Code Sections 1900-1913) El Dorado County General Plan Objective 7.4.1 LTBMU Forest Plan
3. Would the project result in an increase to the risk/threat factors for listing of whitebark pine?	Long term trends in Whitebark Pine stand health within the Project area as measured by threat factors (fire and fire suppression, overutilization, disease, and inadequate regulatory mechanisms)	a. Change (increase) in level of threat factors (low, moderate, and high)	LTBMU Forest Plan USFWS – ESA (http://www.fws.gov/mountain-prairie/species/plants/whitebarkpine/)

Table 3.8-3

Evaluation Criteria and Points of Significance - Vegetation

Evaluation Criteria	As Measured By	Point of Significance	Justification
4. Would the project result in a loss of Threatened and Endangered, Proposed and Candidate, Forest Service Sensitive, or Nevada at Risk Botanical Species?	a. Acres of known occurrences b. Acres of new ground disturbance	a. Greater than 0 acres and 0 individuals b. Greater than 0 acres and 0 individuals	TRPA Threshold Carrying Capacities (Resolution # 82-11) TRPA Code of Ordinances Chapter 61.3.6.A USFWS- ESA (http://www.fws.gov/endangered/laws-policies/regulations-and-policies.html) CESA (Sections 2062 and 2067) El Dorado County General Plan Objective 7.4.1 LTBMU Forest Plan
5. Would the project adversely affect other botanical resources (e.g. CNPS, LTBMU watch list, uncommon plant list communities, special aquatic features or Stream Environment Zones)?	a. Acres of known occurrences b. Acres of new ground disturbance	a. Greater than 0 acres and 0 individuals b. Greater than 0 acres and 0 individuals	TRPA Code of Ordinances Chapter 61.3.3 CEQA (Article 5, Section 15065) CDFW Wildlife Habitat Relationships model - (Version 5.2) California Native Plant Protection Act CDFW Interim Wildlife/Hardwood Management Guidelines El Dorado County General Plan Objective 7.4.2 LTBMU Forest Plan
6. Would the Project result in the removal of any native live trees larger than 24-inch dbh, old forest (SNFPA) or late seral/old growth habitat as defined by TRPA or SNFPA?	Number of native live trees 30 inches or greater in dbh removed Acres of old forest/late seral/old growth habitat removed	Greater than 0 trees of this size removed Greater than 0 acres of habitat permanently removed	TRPA Environmental Checklist TRPA Code of Ordinances Chapter 61.1.4 TRPA Old Growth Threshold SNFPA El Dorado County General Plan Objective 7.4.4 LTBMU Forest Plan

CDFW California Department of Fish and Wildlife
CEQA California Environmental Quality Act
CESA California Endangered Species Act
CNDDDB California Natural Diversity Data Base
CNPS California Native Plant Society

FESA Federal Endangered Species Act
TRPA Tahoe Regional Planning Agency
USFWS United States Fish and Wildlife Service

Analysis Methodology and Assumptions

The analysis of effects on TEPCS botanical species was a three-step process (FSM 2672.43; USDA 2005). In the first step, all TEPCS species that were known or were believed to have potential to occur in the analysis area were identified. This list was developed by reviewing the U.S. Fish and Wildlife List for LTBMU (USFWS 2013), USDA Forest Service Region 5 Sensitive Species List (USDA 2013), LTBMU rare botanical species records and vegetation maps, California Natural Diversity Database records (CNDDDB 2014), and Nevada Natural Heritage Program records (NNHP 2014).

The second step was field reconnaissance surveys. To date, field surveys have been conducted on approximately 700 acres within the botany analysis area, including where activities are proposed. For those areas outside of the surveyed areas, but within the botany analysis area, species occurrence information was compiled using CNDDDB (2013) and NNHP (2013) database records, LTBMU rare botanical species records, and past survey reports.

Field surveys were designed around the flowering period and ecology of the TESP identified in step one. For each TESP occurrence found, information was collected that described the size of the occurrence and habitat characteristics and identified any existing or potential threats. Location information was collected using a Global Positioning System (GPS).

All of this information was used in step three of the analysis—effects analysis. TESP and project activity data were imported into a Geographic Information System (GIS) and used to analyze proximity to the proposed activities, identify direct and indirect effects, and develop resource protection measures.

Data Sources

Basic information describing the life history, ecology, pollination biology, and specific habitat requirements is lacking for most of the sensitive species that occur within the botany analysis area. The scientific literature and internal government documents (i.e. species-specific conservation assessments) were utilized for the analysis whenever available; however more frequently the analysis of effects was based on observations by qualified individuals, field experience, unpublished monitoring results, and studies of comparable species.

3.8-4 ENVIRONMENTAL IMPACTS

IMPACT: VEG-1: Would the Project increase the risk of introduction or spread of invasive plants (aquatic or terrestrial)?

Invasive plants have been documented at Heavenly Mountain Resort. A total of seven sites have been identified (USFS ID Sites #169, #170, #294 (A, B, and C), #296, #439, #364 and #613). Of the seven sites, four are located within Epic

Discovery Project areas or in the immediate vicinity (Sites #439, #169, #296, and #364). Table 3.8-4 identifies the invasive species sites that are within or adjacent to projects in the Proposed Action and Alternatives.

Table 3.8-4

Known Invasive Species Sites Associated with Epic Discovery Projects

Epic Discovery Project	Invasive Site #	Invasive Species Present (# of plants observed/year)	Status of Site	Risk
Mountain Excursion Tour	#296	Tall Whitetop (15/2010, 6/2011, 30/2012, 30,2012)	Active	High risk of spread from human vectors present.
Mountain Excursion Tour	#169	Broadleaf Pepperweed/Tall Whitetop (40/2011, 0/2012, 0/2013)	Inactive	Low risk of spread from vehicular travel/vectors.
Mountain Excursion Tour	#364	Canada Thistle (2005)	Inactive	Low risk of spread from vehicular travel/vectors.
Sky Meadows Zipline Canopy Tour	#296	Tall Whitetop (15/2010, 6/2011, 30/2012, 30,2012)	Active	High risk of spread from human vectors present.
Mountain Bike Park	#439	Canada Thistle (0/2011, 0/2012, 0/2013)	Inactive	Low risk of spread from bicycles/human/vehicular vectors.
Sky Basin Coaster (Alternative)	#296	Tall Whitetop (15/2010, 6/2011, 30/2012, 30,2012)	Active	High risk of spread from human vectors present.

Efforts have been implemented to eradicate and prevent spread of invasive plants at the resort by USFS staff, but diligent pursuit must be made to ensure new establishment is prevented and spread of weeds at known sites does not occur.

The project is purposefully designed to increase visitor usage of the area. This will increase the risk of introduction of invasive plants, as visitors may transport weed seed. Due to the regional and international origin of many visitors to the new proposed facilities, there is a particular risk of the introduction of species not currently known on the LTBMU.

Heavy equipment used during construction also presents a substantial vector for weed introduction. If equipment was previously used in infested areas and then transported and used on the project site, there is a high risk of invasive plant introduction. Much of the equipment used for projects on the LTBMU arrives from the Sacramento and Carson Valleys, which are much more heavily infested than LTBMU lands; so, this equipment poses a particular risk, unless it is cleaned prior to arriving at the project area.

The existing population of tall whitetop (*Lepidium latifolium*) located at the top of Tamarack Express lift (#296) has the potential to spread using humans and vehicles as vectors. The three projects located in this vicinity are the Sky Basin Coaster (Alternative), Sky Meadows Zipline Canopy Tour, and the Excursion Tour. Guests will be arriving at the top of Tamarack Lift to access the Sky Meadows Zipline Canopy Tour and the Sky Basin Coaster (Alternative). Increased human presence in the area increases the chances for the spread of seed from these invasive plants (noxious weeds) to the surrounding area that contains Tahoe draba habitat.

The tall whitetop located at the top of Sky Express lift (#169) has not been active since 2011 and has low potential for spreading due to the Mountain Excursion Tour driving adjacent to the site location. The Mountain Excursion Tour also occurs adjacent to site #364 which contains Canada thistle located at the Sky Meadows area, which is also a low risk site.

The trails associated with the Mountain Bike Park terminate at East Peak Reservoir, adjacent to inactive site #439. This site has a low potential for spread as no plants have been detected in this location in the last three years.

Invasive plant occurrences can result in negative impacts to all ecosystems, although different habitats may be invaded by different noxious weed species. Epic Discovery projects at Heavenly have a moderate risk to spread tall whitetop and Canada thistle, which has been documented within the project areas. Invasive plant occurrences can lead to changes in habitat characters that are detrimental to sensitive plant species. Once weeds have become established they can indirectly impact sensitive species through allelopathy (the production and release of chemical compounds that inhibit the growth of other plants), alter fire regimes, and compete for nutrients, light, and water. Because invasive plants can be difficult to control or eradicate, weed control efforts that must be conducted on a regular basis, such as hand-pulling or digging, could also negatively impact sensitive plants. Standard management requirements such as inventory, avoiding noxious weed areas during ground disturbing activities, and using weed free nursery material should be utilized to greatly reduce the threat from invasive plant establishment and infestation.

No indirect effects are expected from revegetation efforts, which will facilitate recovery of disturbed areas by reducing erosion and improving vegetation structure by enhancing native species. Revegetation efforts will be implemented in the areas surrounding project installation of structures associated with the Forest Flyer Coaster, Sky Cycle Canopy Tour, Sky Basin Coaster (Alternative)

and the Ridge Run Lookout Tower. Revegetation efforts will facilitate recovery of disturbed areas by reducing erosion and improving vegetation structure by enhancing native species.

Native vegetation associations can be negatively impacted as a result of invasion of noxious weeds. Changes in habitat may result once noxious weeds become established. Weed species are often more vigorous than native species and provide competition for water, light and nutrient resources. Changes in vegetation structure, decreased soil stability and impacts on fire regimes can also occur as a result of noxious weed invasion. Once noxious weeds become established, control efforts can also negatively impact native species, through trampling, damage from digging and soil disturbance.

During implementation and operations under their Master Plan, Heavenly Mountain Resort is required to implement design feature VEG-1C Noxious Weed Management mountainwide. This design feature requires the continued treatment of known noxious weeds and invasive species.

The 2007 MPA provides the invasive plant management measures for all projects implemented as part of the Master Plan. In 2011, Forest Service Manual direction (FSM 2900) clarified the difference between ‘noxious weed’—those plants designated on federal or state noxious weed lists and ‘invasive plant’— those alien species likely to cause economic, human health, or environmental harm. So while older documents may use the term ‘noxious weed’, the direction applies to all invasive plants on LTBMU. The invasive plant measures in the 2007 MPA are as follows:

1. As a term and conditions of Heavenly Mountain Resort’s Special Use Permit, Heavenly will develop a long-term integrated weed management plan. This plan should include annual monitoring associated with existing weed infestations and new project construction. Plans should include control and abatement plans, restoration and revegetation plans, and annual reporting requirements (weed treatments, infestation sizes, and locations will be reported). Currently, three noxious weed species are located within Heavenly Mountain Resort’s boundary on both Forest Service and privately owned land: tall whitetop (*Lepidium latifolium*), Canada thistle (*Cirsium arvense*) and bull thistle (*Cirsium vulgare*).
2. Summertime maintenance and excavation equipment vehicles used for project implementation should be weed free and cleaned of all attached mud, dirt, and plant parts before entering the project area. This practice shall be done at a vehicle washing station or steam cleaning facility (power or high-pressure cleaning) before the equipment and vehicles enter the project area.
3. Equipment, materials, or crews shall not be staged in noxious weed infested areas.
4. 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 Noxious Weed Coordinator. Topsoil from disturbance will be saved and put back to use in onsite revegetation, unless contaminated with noxious weeds. All activities that require seeding or planting should use locally collected native seed sources whenever possible. Plant and seed material should be collected from as close to the project area as possible, from within the same watershed and at a similar elevation whenever possible. Persistent non-natives such as timothy (*Phleum pretense*), orchardgrass (*Dactylis glomerata*), or ryegrass (*Lolium sp.*) should be avoided. Seed mixes should be approved by Forest Service Botanists.

5. 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.

6. Construction areas should be monitored for 3 years post-project to ensure that no new weed infestations move into the area disturbed during project implementation.

7. Heavenly will implement an annual employee orientation and training program for employees that work in ground disturbing activities. Training could include an introduction to the noxious weeds currently present on the mountain, (tall whitetop, Canada thistle, and bull thistle), photographs of the weeds, a map identifying known weed locations, and a list of the mitigation measures being implemented to eradicate the noxious weeds.

CEQA and TRPA

Analysis: *Less Than Significant; Proposed Project and Alternatives*

There are known populations of invasive plant species that occur within the Project Area as noted above. Standard management measures and existing mitigation measure VEG-1C are included in the Proposed Action to mitigate impacts to known rare plant species and habitats from noxious weeds and invasive species. Based on the inclusion of recommended mitigation measures in the Proposed Action and Alternatives that would require continued treatment of known sites and measures to prevent the spread of invasive species, this impact is considered to be less than significant.

NEPA

Analysis: *No Adverse Effects; Proposed Project and Alternatives*

There are known populations of invasive plant species that occur within the Project Area as noted above. MPA 07 design features and MP 96 mitigation measures are included in the Proposed Action to mitigate adverse effects to known rare plant species and habitats from noxious weeds and invasive species. Based on the inclusion of recommended design features in the Proposed Action and Alternatives that would require continued treatment of known sites and

measures to prevent the spread of invasive species, no adverse effects will occur that would result in the increase of spread of invasive species or noxious weeds.

IMPACT: VEG-2: Would the Project result in an overall decrease in long term trends in Tahoe draba populations within the Project area?

Tahoe draba (*Draba asterophora* var. *asterophora*) is known to occur in a total of 15 occurrence locations within the Special Use Permit Boundary. Of these 15 occurrence locations, a total of five occurrences are within or immediately adjacent to two activities included in the Proposed Action and one activity included in the Alternatives. Table 3.8-5 outlines these occurrences in relation to the projects that may impact Tahoe draba.

Table 3.8-5

Tahoe Draba Occurrences Impacted by Epic Discovery Projects

Tahoe Draba Occurrence #	# of Tahoe draba plants	Mountain Excursion Tour	Sky Zipline Canopy Tour	Sky Basin Coaster (Alternative)
DRASAA	250-499	X		
DRASAB	780	X		
DRASAC	250-499	X		
DRASAE	500-999	X		
DRASAH	1250-1500	X	X	X

HBA 2014

Direct and Indirect Effects: As identified in Table 3.8-5, three of the Epic Discovery projects are located within or in close proximity of existing Tahoe draba populations: Sky Meadows Zipline, Sky Basin Coaster (Alternative), and the Mountain Excursion Tour.

The Sky Meadows Zipline and the Sky Basin Coaster (Alternative) both have access trails that lead from the top of Tamarack Lift to the top of each of the projects. The existing trail leads from the top of Tamarack lift directly south through the Tamarack Tahoe Draba Transplant Project. This area contains historical Tahoe Draba transplant locations and seed plots that were created as mitigation during the installation of Tamarack lift in 1999. The second portion of the trail starts at the end of the access roadway that terminates at the top of California Trail, where it turns south toward the top of the Sky Zipline Canopy Tour and the Sky Basin Coaster (Alternative). This portion of the trail is located in occurrence DRASAH which contains 1250-1500 plants as of 2012. As these proposed trails have not been flagged and identified on the ground, the potential exists for individual plants to be removed or impacted by construction activities.

Existing mitigation measure 7.5-22 *Tahoe Draba Long-Term Conservation Strategy* requires the avoidance and protection of all Tahoe draba within the Tahoe Basin. Therefore, if the proposed access/maintenance trail location cannot avoid direct and indirect impacts to existing Tahoe draba individuals, populations or habitat, the proposed access trails must be eliminated or relocated.

Based on DNA and cytological studies performed by Putnam (2013), the *Draba asterophera* complex “appears to be composed of three separately evolving trajectories” based on separate geographic locations/regions surrounding Lake Tahoe. Based on the information contained in this study, it is recommended each population cluster (Heavenly and Freel Peak is one such cluster) should be treated as a distinct taxonomic entity. This information relates to the fragile nature of *Draba asterophera* var. *asterophera* and outlines the need for conservation and protection of existing individuals. Additionally, the populations of *Draba asterophera* var. *asterophera* in the study were currently found to be stable, all populations were relatively small, with low densities, exhibited low fecundity and were located in narrow geographic boundaries (Putnam 2013). These factors do not allow for the rapid re-population of this species after disturbance and further put the species at risk as a result of habitat loss and loss of individuals. Protection of existing adult plants is vital to the continued health of the existing population located at Heavenly.

Increased disruption of DRASA habitat through the installation of trails that bisect and fragment habitat may result in indirect impacts to the existing population located within the resort. As noted above, DRASA is confined to relatively narrow geographic boundaries in the form of “relatively open north-facing alpine habitats on steep granitic slopes” (Putnam 2013). The bisection of suitable habitat (while not directly impacting any individuals) has the potential for detrimental indirect effects to the species in the form of habitat loss and increased disturbance through compaction and human disturbance. The limited suitable habitat for DRASA should be avoided to the extent possible to preserve the existing population cluster located within the resort.

The Mountain Excursion Tour, as described in Chapter 2, utilizes the summer access roadways that connect the top of the Nevada and California sides of Heavenly Mountain Resort. The summer roadway (Skyline Trail) that connects the two sides traverses along the ridge line just to the west of Monument Peak. Suitable draba habitat exists along the summer access roadway and a total of five Tahoe draba occurrences are located adjacent to the roadway. All five of these occurrences have plants growing along the cut and fill slopes immediately adjacent to the roadway. The vehicles to be used for the Mountain Excursion Tour have the ability to impact individuals by crushing plants along the road edge during operation.

The potential for increased human traffic along the summer roadway increases the potential for impacts to Tahoe draba in the form of habitat modification and trampling of individuals. The roadways are currently utilized by hikers as well as

maintenance vehicles during the summer months. The existing mitigation measures 7.5-21 *Protect Tahoe Draba Populations within Heavenly Mountain Resort* and 7.5-22 *Tahoe Draba Long-Term Conservation Strategy*, require the use of fencing around known populations to protect Tahoe draba. The fencing required is to be four feet in height. Existing fencing along the summer roadways in the areas of Tahoe draba have been metal project stakes used to hold up a rope line. This rope line effectively prevents vehicular access in these areas, however human access is not deterred as guests have been observed within the closed area. This impact is considered potentially significant.

CEQA and TRPA

Analysis: *Potentially Significant; Proposed Project and Alternative*

Implementation of the Epic Discovery projects, namely the access/maintenance trails for the Sky Meadows Zipline and Sky Basin Coaster (Alternative), and the truck traffic along Skyline Trail for the Mountain Excursion Tour, will have the potential to impact Tahoe draba individuals. With the exception of the proposed access/maintenance trail for the Sky Meadows Zipline and Sky Basin Coaster (Alternative), the direct removal of Tahoe draba individuals will not result from project implementation, but the potential exists for indirect impacts to Tahoe draba as a result of habitat loss and trampling due to increased human activity. Continued implementation of the MPA 07 mitigation measures and design features listed in Chapter 2 will decrease these impacts to less than significant with the modification to mitigation measure 7.5-21: *Protect Tahoe Draba Populations within Heavenly Mountain Resort* outlined below.

NEPA

Analysis: *Potentially Adverse Effect; Proposed Project and Alternatives*

Implementation of the Epic Discovery projects, namely the Sky Meadows Zipline, Sky Basin Coaster (Alternative), and the Mountain Excursion Tour, will have the potential to impact Tahoe draba individuals which are known to occur within 20m of each of these projects. With the exception of the proposed access/maintenance trail for Sky Meadows Zipline and Sky Basin Coaster (Alternative), the direct removal of Tahoe draba individuals will not result from project implementation, but the potential exists for indirect impacts to Tahoe draba as a result of habitat loss and trampling due to increased human activity. Continued implementation of the MPA 07 mitigation measures and design features listed in Chapter 2 will reduce the potential for adverse effects with the modification to mitigation measure 7.5-21: *Protect Tahoe Draba Populations within Heavenly Mountain Resort* outlined below.

Mitigation: **VEG-1: Update MPA 07 Mitigation Measure 7.5-21: *Protect Tahoe Draba Populations within Heavenly Mountain Resort***

Update MPA 07 Mitigation Measure 7.5-21: *Protect Tahoe Draba Populations within Heavenly Mountain Resort* as follows: Item #2 second sentence shall read:

“Fencing shall be installed prior to the onset of project activities, operations or construction, shall be at least 4 feet in height and shall be fencing that prevents foot traffic. The fencing shall be installed along the boundary of any construction zone, staging areas, or roads and trails that will be used for construction access and shall be located immediately adjacent to permanently installed features (e.g., access trails) in areas of existing Tahoe draba plants.”

CEQA and TRPA

After Mitigation *Less Than Significant, Proposed Project and Alternatives*

NEPA

After Mitigation *No Adverse Effects, Proposed Project and Alternatives*

IMPACT: VEG-3: Would the project result in an increase to the risk/threat factors for listing of whitebark pine?

The USFWS issued a 12-month finding on a petition to list whitebark pine as threatened or endangered with critical habitat in August of 2011. This finding determined the whitebark pine (*Pinus albicaulis*) warrants protection under the Endangered Species Act (ESA), but that adding the species to the Federal List of Endangered and Threatened Wildlife and Plants was precluded by the need to address other listing actions of a higher priority. The finding listed a number of factors that the USFWS determined to be threats to the viability and continued existence of whitebark pine. The threats identified include direct loss from fire (and more importantly fire loss), disease (white pine blister rust and mountain pine beetle) and climate change (USFWS 2011). These threats are discussed below in relation to the species and the potential for the Epic Discovery Project to increase the threat of these factors.

Fire and Fire-Suppression – Potential impacts to local whitebark pine populations and stands exist from the threat of catastrophic fire. A large fire within Heavenly’s Special Use Permit Boundary could impact a large number of whitebark pine. Additionally, over time, fire suppression activities have resulted in the increase in shade tolerant conifer species within whitebark pine stands (USFWS 2011). This change in structure and composition facilitates the increased severity and frequency of wildfire that could result in a stand replacing event and result in the loss of genetic diversity necessary for the species survival in the region.

Disease – By far the largest threat to whitebark pine is from disease in the form of nonnative white pine blister rust. The white pine blister rust (*Cronartium ribicola*) occurs throughout the range of whitebark pine and results in the mortality of infected individuals of all age classes. Typically, white pine blister rust (WPBR) kills cone-bearing branches and seedlings. The existing mortality rate due to WPBR infection is expected to be as high as 57% by 2110 (USFWS 2011). It should be noted a small percentage of whitebark pine are naturally

resistant to infection from WPBR and the potential loss of these individuals may result in the genetic material necessary to stave off extreme levels of WPBR infection.

Whitebark pine is also currently being impacted by predation from the mountain pine beetle (*Dendroctonus ponderosae*). The mountain pine beetle attack trees that are often weakened by drought pressures or other infection (WPBR). Upon attacking a tree, the mountain pine beetle mate in the phloem of the tree just under the bark in the living vascular tissue. The females lay their eggs in the phloem which is eaten by the larvae, effectively girdling the host tree resulting in death. The life cycle of beetle is temperature dependent and usually takes between 1 and 2 years.

The combination of impacts from white pine blister rust and mountain pine beetle result in significant loss to seed cone production. Mountain pine beetle target and kill larger trees which produce the largest number of cones. White pine blister rust often kills cone bearing branches. Together these impacts to seed cone production can decrease the fecundity of the species.

Climate Change – Whitebark pine typically occurs in cold, exposed high-elevation sites. The increase in temperature that is likely to occur as a result of climate change will result in the decrease in suitability of current habitats for whitebark pine through the loss of soil moisture (Hamman and Wang 2006, Schrag et al. 2007, Aitken et al. 2008). Suitable habitat loss could occur through the overall increase in temperature resulting in the species unable to survive or the increase in competition from other conifer species currently adapted to warmer temperatures. As temperatures increase the area of available habitat decreases at high elevations due to limited space on mountain tops. Increased temperatures also have a positive effect on the mountain pine beetle's life cycle which under warm temperatures can be completed in one year.

The USFWS has determined these threats individually and together have the potential to result in the extinction of whitebark pine throughout all or a significant portion of its range. For a detailed discussion of each of the above threats and associated impacts, please refer to the 12-month finding referenced above (USFWS 2011).

Existing conditions – Within Heavenly Mountain Resort, whitebark pine exists at higher elevations in mixed stands above 8,000 feet and as pure stands along ridge tops and slopes above 9,200 feet to the top of Monument Peak at 10,100 feet. The distribution of whitebark pine within the Special Use Permit Boundary is currently being determined through mapping and field verification. EVeg and TEUI layers were utilized together to determine the potential locations of whitebark pine. These potential areas were then re-classified using local knowledge and aerial photography to determine the location of whitebark dominant stands. Based on the re-classification/mapping exercise, a total of 910 acres of whitebark dominant stands were identified and 2,827 acres of mixed stands with the potential for whitebark pine to be present. Subsequent to the re-mapping effort a total of 91 plot locations were sampled within the whitebark

dominant stands to determine the stand characteristics and the degree of infection from WPBR and mountain pine beetle. The data is currently being entered into FSVeg where it will be analyzed using FVS (Forest Veg Simulator) to generate the desired output. Upon completion of the analysis of the data generated from the 91 plots, the overall health of the stands will be determined, and subsequently a Conservation Action Plan will be generated for the whitebark pine stands located within the Heavenly Special Use Permit Boundary.

Direct and Indirect Impacts – Direct impacts to whitebark pine will result due to direct removal of individuals as a result of Epic Discovery Projects. The following projects will result in tree removal with the potential for removal of whitebark pine: Mid-Station Zipline Canopy Tour, Forest Flyer Alpine Coaster, Sky Cycle Canopy Tour, East Peak Zipline Canopy Tour, Sky Meadows Zipline Canopy Tour, Sky Basin Coaster (Alternative), and the Gondola Emergency Evacuation Route. Table 3.8-6 lists projects that will result in the loss of whitebark pine. The Forest Flyer Alpine Coaster, Sky Meadows Zipline Canopy Tour, and Sky Basin Coaster (Alternative) are proposed to occur in whitebark dominant stands. The remaining projects are located in mixed stands that contain whitebark pine.

Table 3.8-6

Epic Discovery Projects Resulting in Whitebark Pine Removal

Project Name	Acres of Whitebark Pine Removal	Acres of Removal within Whitebark Pine Dominant Stands
Mid-Station Zipline Canopy Tour	1.91	0
Forest Flyer Alpine Coaster	0.70	0.70
Sky Cycle Canopy Tour	1.93	0
East Peak Zipline Canopy Tour	1.48	0
Sky Meadows Zipline Canopy Tour	4.12	4.12
Emergency Gondola Evacuation Route	4.70	0
Sky Basin Coaster (Alternative 1)	2.50	2.50
Total Proposed Action	14.84	4.82
Total Alternative 1 (No Forest Flyer)	16.64	6.62
Total Alternative 2 (No Sky Basin Challenge Course)	14.84	4.82

As shown in Table 3.8-6, a total of 14.84 acres of forested habitat containing whitebark pine (4.82 acres in whitebark pine dominant stands) will be permanently removed as a result of project implementation under the Proposed

Action and Alternative 2. Alternative 1 would include the removal of 16.64 acres of forested habitat containing whitebark pine (6.62 acres of whitebark pine dominant stands). Of the total 910 acres of whitebark pine dominant stands located within the special use permit boundary, the projects listed above in whitebark dominant stands (up to 6.62 acres) will result in a loss of approximately 0.8 percent. The remaining projects with the potential to remove whitebark pine in mixed stands (2,827 acres) would result in a loss of 10.02 acres (0.3% loss).

Removal of healthy whitebark pine trees from the area will likely result in the loss of “plus trees” which are potentially resistant to infection from the white pine blister rust (*Cronartium ribicola*). The loss of these “plus trees” could result in a loss of genetic diversity that contains resistance to disease.

Implementation of the Epic Discovery projects will result in an increase in human activity in the forested environment at Heavenly Mountain Resort. This increase in human presence in the forest increases the chances for wildfire. The existing snowmaking system can be utilized in the event of a wildfire in the area, however many of the proposed activities are located in areas away from existing ski trails and associated snowmaking systems. Heavenly Mountain Resort has a strict management directive that prohibits smoking in their facilities or in outdoor areas (Operations Plan), which diminishes the potential for fires from guest activities.

The Epic Discovery projects will not result in any significant changes in climate (see Chapter 3.4, Air Quality and Climate Change) as a result of project implementation, and therefore will not contribute to this risk factor for whitebark pine.

CEQA and TRPA

Analysis: *Less Than Significant; Proposed Project and Alternatives*

Direct and indirect impacts to whitebark pine may occur as a result of Epic Discovery Project implementation. The effects are relatively minor (less than 1% acreage removal of both mixed and whitebark pine dominant stands), and the associated potential for the loss of “plus trees” which are resistant to white pine blister rust. The Epic Discovery Projects will not result in the increase in the threat factors to whitebark pine. This impact is considered less than significant. Further, upon completion of the data analysis for the recently completed stand assessments, a Whitebark Pine Conservation Action Plan will be prepared, reviewed and adopted for future use at Heavenly Mountain Resort. The Plan will include necessary measures for the protection of the existing stands and to promote stand health and will be implemented within the Heavenly Mountain Resort Special Use Permit Boundary for future Master Plan development and operations.

NEPA

Analysis: *No Adverse Effects; Proposed Project and Alternatives*

Direct and indirect impacts to whitebark pine may occur as a result of Epic Discovery Project implementation. The effects are relatively minor (less than 1%

acreage removal of both mixed and whitebark pine dominant stands), and the associated potential for the loss of “plus trees” which are resistant to white pine blister rust. The Epic Discovery Projects will not result in the increase in the threat factors to whitebark pine. Adverse effects will result to the population of whitebark pine through the direct removal of 14.84 acres (Proposed Action and Alternative 2) and 16.64 acres (Alternative 1). However, this loss is considered to be minor compared to the habitat located within the Special Use Permit Boundary and is not expected to result in a trend toward federal listing.

IMPACT: VEG-4: Would the project result in a loss of T&E, P&C, FSS, or Nevada at Risk Botanical Species?

Table 3.8-1 lists the species that are included for evaluation in this document. Of the species listed, only three are known to occur within the Special Use Permit Boundary: *Draba asterophera* var. *asterophera* (Tahoe draba), *Arabis rigidissima* var. *demota* (Galena Creek rockcress), and *Pinus albicaulis* (whitebark pine). Impacts to Tahoe draba are discussed in VEG-2 above and impacts to whitebark pine are discussed in VEG-3 above. Galena Creek rockcress is known to occur in only one location (Occurrence ARRID6b) within the Heavenly Mountain Resort Special Use Permit Boundary. The ARRID6b occurrence location is immediately adjacent to the existing summer roadway that will be utilized by the Mountain Excursion Tour below the Comet Express chairlift. This occurrence was first discovered in 2008. Subsequent surveys of the area in 2009, 2012 and 2013 have not located any plants. It is thought the plants (N=2) were destroyed during construction activities in 2009. Use of the existing summer roadway for construction activities and for the Mountain Excursion Tour will not result in any impacts to the site. Floristic surveys have occurred for all Epic Discovery Project areas. No additional occurrences of Galena Creek rockcress or other sensitive species (with the exception of Tahoe draba and whitebark pine) were noted.

While surveys for sensitive and rare plant species have not detected sensitive species other than those noted above, the potential exists for disturbance to rare/sensitive species habitats. Forest Service botanists mapped suitable habitat for sensitive species using GIS analysis. Based on the GIS analysis, potential habitats are defined for the following rare plant species:

***Arabis rigidissima* var. *demota*, Galena Creek rock cress:** Within the Operations Boundary, there are approximately 185 acres of potential habitat for Galena Creek rock cress identified within or adjacent to the projects proposed.

***Botrychium* species, moonwort complex:** Within the Operations Boundary, there are approximately 25 acres of potential habitat for moonwort species identified adjacent to the proposed projects. However, the habitat will not be impacted as no projects are located within suitable habitat.

***Bruchia bolanderi*, Bolander’s candle moss:** Within the Operations Boundary, there are approximately 25 acres of potential habitat for Bolander’s candle moss identified within or adjacent to the proposed projects.

***Dendrocollybia racemosa*, branched collybia:** Potential habitat for branched collybia is located within the Panorama trail project area. Potential habitat is found in mixed conifer old growth stands that have a mineral soil and duff layer and a source of moisture retention (i.e., a stream, or down woody debris).

***Draba asterophora* var. *macrocarpa*, Cup Lake draba:** Within the Operations Boundary, there is potential habitat for Cup Lake draba identified within or adjacent to the proposed projects. This variety is currently known from one element occurrence; therefore, specific habitat preferences are not well defined.

***Draba crucicata*, Mineral King draba:** Within the Operations Boundary, there is potential habitat for Mineral King draba within or adjacent to the proposed projects in the form of rocky slopes and ridges. Protection measures for Tahoe draba habitat as required under existing MPA 07 mitigation measures will protect this species which has not been observed during floristic surveys.

***Erigeron miser*, starved daisy:** Within the Operations Boundary, there is potential habitat for starved daisy where granitic rock outcrops occur.

***Eriogonum umbellatum* var. *torreyanum*, Torrey's or Donner Pass buckwheat:** Within the Operations Boundary, there are approximately 35 acres of potential habitat for Torrey's buckwheat identified within or adjacent to the proposed projects. No observations of this species have been recorded during project surveys.

***Helodium blandowii*, Blandow's bog-moss:** Blandow's bog-moss was not observed during project surveys. For the proposed Epic Discovery Projects, potential habitat can be found in the riparian zones that may be affected within the East Peak Water Activities project area. No observations of this species have been recorded during project surveys.

***Hulsea brevifolia*, short-leaved hulsea:** Within the Operations Boundary, there is potential habitat for short-leaved hulsea where red fir and mixed conifer forests are the dominant vegetation type. The Panorama trail will be located in this habitat type. No observations of this species have been recorded during project surveys.

***Lewisia kelloggii* ssp. *hutchisonii* and *L. kelloggii* ssp. *kelloggii*, Kellogg's lewisia:** Within the Operational Boundary, there is potential habitat for Kellogg's lewisia where there are open ridgetops or flat areas. This species is often found growing in similar habitat to and looks very similar to pussypaws. The top stations for the Sky Basin Coaster (Alternative) and Sky Meadows Zipline will be located in areas suitable for these species. No observations of this species have been recorded during project surveys.

***Peltigera gowardii*, veined water lichen:** Within the Operations Boundary, there are approximately 5 acres of potential habitat for veined water lichen found downstream of projects and could be affected by activities in the upper watershed.

The Epic Discovery Project will result in both permanent and temporary loss of potentially suitable habitat for sensitive plant habitats noted above and in Table

3.8-1. The Epic Discovery Project (and Alternative) will result in permanent disturbance of up to 8.45 acres (368,243 sq. ft.) and temporary construction disturbance of up to 17.97 acres (782,941 sq. ft.).

CEQA and TRPA

Analysis: *Less Than Significant; Proposed Project and Alternatives*

There are no known threatened or endangered plant species that occur within the Special Use Permit Boundary. MPA 07 design features and MP 96 mitigation measures are included in the Proposed Action and Alternatives to mitigate impacts to known rare plant species. These measures include: 7.5-21: Protect Tahoe Draba Populations within Heavenly Mountain Resort; 7.5-22: Tahoe Draba Long-Term Conservation Strategy; 7.5-23: Minimize Loss/Degradation of Sensitive Plant Species; and 7.5-24 Noxious Weed Management. Tahoe draba and Galena Creek rock cress have the potential to be impacted by project activities since these two special status plant species are mapped and/or known to occur within the project area. Based on the inclusion of recommended mitigation measures in the Proposed Action that would require avoidance within the Lake Tahoe Basin, this impact is considered to be less than significant.

NEPA

Analysis: *No Adverse Effects; Proposed Project and Alternatives*

Measures included in the Proposed Action (referenced above under CEQA and TRPA) require avoidance of Forest Service Sensitive plant species in the Lake Tahoe Basin. Implementation of projects outside of the Lake Tahoe Basin may result in loss of individuals and habitat of Galena creek rock cress or Tahoe draba, but would not result in a trend toward federal listing or loss of viability to these species.

The Proposed Action and Alternatives may affect sensitive species habitat as noted in the analysis above. However, as none of these species have been observed during project surveys, no individuals will be impacted and implementation of the Proposed Project or Alternative will not result in a trend toward federal listing or loss of viability of the species noted above.

IMPACT: **VEG-5: Would the project adversely affect other botanical resources (e.g. CNPS, LTBMU watch list, uncommon plant list communities, special aquatic features or Stream Environment Zones)?**

The Lake Tahoe Basin Management Unit (LTBMU) maintains a watch list of plant species that are of conservation concern, but have not been designated as Sensitive by the Regional Forester. This "Special Interest" plant list includes species that are newly described; locally rare; range expansions or disjunctive populations; plants of specific public interest; or species with too little information to determine their appropriate status. According to the Regional Forester, Watch List plant species should be considered during project planning.

Table 3.8-7

LTBMU Watch List Plant Species

Scientific Name	Common Name	Habitat Characteristics
<i>Arabis rectissima</i> var. <i>simulans</i>	Bristlyleaf rock cress	Dry, sandy, granitic or andesitic soil on mostly gentle slopes of all aspects, in full or filtered sunlight of thinly-littered openings in mature, open Jeffrey pine and white fir; 6,000-7,400 ft.
<i>Meesia longiseta</i>	Meesia moss	Usually in fens but sometimes along freshwater streams at high elevations.
<i>Myurella julacea</i>	Myurella moss	Seep like granitic rock walls; on soil over rocks or in crevices in alpine boulder and rock fields; subalpine coniferous forest on damp soil over rocks; 8,800-9,900 ft.
<i>Orthotrichum shevockii</i>	Shevock's bristle-moss	Dry granitic rock outcrops in Carson Range, Douglas and Carson City Counties.
<i>Orthotrichum spjutii</i>	Spjut's bristle moss	Continually misted, shaded granitic rock faces at high elevations near Sonora Pass.
<i>Pohlia tundra</i>	Tundra pohlia moss	Gravelly, damp soils of alpine boulder and rock fields; 8,800-9,900 ft.
<i>Sphagnum spp.</i>	sphagnum	Wet meadows, bogs, fens; sea-level to subalpine.

Botanical surveys for the project area were completed in 2013 and did not locate any watch list species. Potential impacts as a result of the Proposed Project and the Alternatives will not occur as none of the watch list species are present within the project area.

Section 3.8-3 outlines the Uncommon Plant Communities that have been identified by the Tahoe Regional Planning Agency. TRPA has applied non-degradation standards to these communities which are as follows: deep-water plants of Lake Tahoe; Grass Lake; Osgood Swamp; Hell Hole; Upper Truckee Marsh; Taylor Creek Marsh; Freel Peak Cushion Plan Community; and Pope Marsh.

The Sierra Nevada Forest Plan Amendment (SNFPA) directs Region 5 forests to address "fens and bogs" as a botanical resource during project analyses and to maintain, restore, and/or enhance fens on National Forest System (NFS) lands (USDA 2004). Fens are ground-water dependent wetlands that are hotspots of biological diversity and provide habitat for rare plants such as *Meesia*, *Sphagnum*, and other bryophytes. Fens are among the most sensitive plant communities identified during ecological assessments of the Sierra Nevada (Sierra Nevada Ecosystem Project 1996; USDA 2004). There are 54 known fens within the LTBMU.

Three of the Epic Discovery Projects result in new land disturbance and land coverage in mapped Stream Environment Zones (SEZ). The Sky Meadows Challenge Course is located immediately adjacent to Heavenly Valley Creek. A gravel pathway (604 sq. ft.) is proposed to be installed in the SEZ area for access and maintenance purposes. The SEZ in this area is composed of grasses (*Carex nebrascensis*, *Juncus occidentallis* and *Poa preetensis*) and forbs (*Gayophytum diffusum* and *Phacellia hastata*). Construction of the gravel pathway will result in minor removal of this vegetation but will not result in changes to the functioning of the overall habitat structure that exists closer to the stream channel in the form of large willow bushes.

The installation of the Sky Meadows Challenge Course will also result in the removal of limbs from the trees in the SEZ. The change in canopy cover in this area may have an impact on the quality of the SEZ. The removal of tree limbs may result in an increase in water temperature in Heavenly Valley Creek through decreased shading. Past modification to the tree canopy are evident on historical aerial photographs in the area. The condition of the stream in this area shows evidence of being degraded as noted in Chapter 3.1 Water Quality. Increased sun exposure to this portion of the SEZ may compound existing stressors to the health of the SEZ.

The Sky Meadows Zipline access trail crosses (168 sq. ft.) an ephemeral drainage high in the watershed of a tributary of Heavenly Valley Creek. This crossing location is within a mixed conifer stand and does not contain any SEZ habitat features as the ephemeral nature of the channel does not support SEZ vegetation.

The Panorama Trail also crosses a tributary of Heavenly Valley creek in the Maggie's Canyon area (150 sq. ft.). This trail crossing is within a mixed conifer stand and does not contain any SEZ habitat features as the ephemeral nature of the channel does not support SEZ vegetation. It is likely the Panorama Trail will cross other ephemeral drainages lower in the watershed that exhibit similar vegetation and conditions as those discussed above. While these three activities cross mapped SEZ boundaries, no impacts to SEZ habitats will occur as a result of their construction and operation.

The Sky Basin Coaster (Alternative 1) crosses SEZ boundaries located near the Sky Meadows Lodge and access roadway. The base terminal loading and unloading platforms and the lower segments of the coaster alignment cross SEZ boundaries located between the existing on mountain access roadway and the proposed location for the coaster top terminal (adjacent to the Tamarack Lift top station). Because of its linear nature, the Coaster cannot avoid the mapped SEZs and still unload passengers in the vicinity of the existing mountain access roadway. The SEZ in this location is a mix of grasses and forbs with larger areas of Salix shrubs and aspen scattered throughout the edges of the existing ski trails that currently bisect this area. Since the Sky Basin Coaster can be constructed above the ground with only minimal disturbance required for the coaster footings, vegetation removal will be minimal. The footings required for the coaster will result in minor removal of riparian vegetation, but will not result in changes to

soil compaction, hydrology or otherwise result in an adverse effect on the functioning of the SEZ habitat.

CEQA and TRPA

Analysis: *Less Than Significant; Proposed Project and Alternatives*

The Epic Discovery Project and Alternatives will not result in any impacts to uncommon plant communities or fens and bogs as none of the listed communities or fens and bogs occur within, or adjacent to, the project area. The Epic Discovery Project and Alternatives will result in the loss of riparian vegetation in SEZs, however this loss is minor and will not result in the loss of functioning SEZ habitat, therefore this impact is considered to be less than significant.

NEPA

Analysis: *No Adverse Effects; Proposed Project and Alternatives*

The Epic Discovery Project and Alternatives will not result in any adverse effects to other botanical resources as no watch list species identified by LTBMU were located within, or adjacent to, the project area.

IMPACT: **VEG-6: Will the Project result in the removal of any native live trees larger than 24-inch dbh, and late seral habitat as defined by TRPA or SNFPA?**

The proposed Epic Discovery Projects and Alternative will result in the removal of 24" trees. In order to estimate the number of trees 24" and larger that are proposed for removal, stand data collected for the 2007 Master Plan Amendment EIR/EIS/EIS was utilized. The stands were surveyed in 2006 for project areas where Epic Discovery projects will be located. These stand characteristics remain valid to determine the number of trees in each stand area and the ratio of trees larger than 24" dbh and the number of trees less than 24" dbh. Using this data, the acreage of tree removal required for each project is utilized to calculate the estimated number of trees required for removal and the percentage of trees likely to be 24" dbh and larger. A total of five stands were identified for sampling and the results are outlined in Table 3.8-8. Please refer to Vegetation Impact VEG-3 in the 2007 EIR/EIS/EIS for a description of the methods utilized for the stand analysis.

A total of seven Epic Discovery Projects will require measurable tree removal. Table 3.8-9 identifies the acres of clearing required for each project and the number of trees larger than 24" that are likely to be removed based on the number of 24" or larger trees/acre identified in Table 3.8-8.

Table 3.8-8

Number of 24” or Larger Trees/Acre by Stand

Stand Name	Number of 24” or larger trees/acre
Upper California Stand	13.6/acre
Lower California Stand	8.2/acre
Von Schmidt Flat Stand	9.8/acre
Upper Nevada Stand	9.1/acre
Lower Nevada Stand	14.8/acre

Source: HBA 2006

In order for the trees to be removed in the Lake Tahoe Basin, findings must be made by the TRPA. Two TRPA Code sections (61.1.4 and 61.1.7) address removal of trees at ski areas. Each of the code sections is printed below followed by a discussion of whether the necessary finding can be made.

61.1.4 Standards for Conservation and Recreation Lands or SEZs: Within lands classified by TRPA as conservation or recreation land use or SEZs, any live, dead, or dying tree larger than 30 inches diameter at breast height (dbh) in west side forest types shall not be cut, and any live, dead or dying tree larger than 24 inches diameter at breast height in eastside forest types shall not be cut, except as provided below.

- (6) In ski areas with existing TRPA-approved master plans, trees larger than 30 inches dbh in the westside forest types and 24 inches dbh in eastside forest types may be removed for facilities that are consistent with that master plan. For activities that are consistent with a TRPA-approved master plan, trees larger than 30 inches dbh in the westside forest types and 24 inches dbh in eastside forest types may be removed when it is demonstrated that the removal is necessary for the activity.

Tree removal for the Epic Discovery project is required in order to operate the proposed activities (e.g., ziplines, canopy tours, sky cycle and coasters require tree removal for facility construction or user safety). The design feature included in the 2007 EIR/EIS/EIS to restore a 41 acre stand in High Meadows to advance late seral old growth characteristics has been implemented by Heavenly and will also offset effects of removal of large trees over 24 inches in diameter for the proposed Epic Discovery Project. The 41 acres treated in High Meadows was larger than was required for mitigation of impacts identified in the 2007 EIR/EIS/EIS (19.32 acres) and is sufficient to offset impacts resulting from removal of approximately 161 trees (Proposed Action and Alternative 2) and 188 trees (Alternative 1) larger than 24” dbh. The removal of 14.84 acres of large trees under the Proposed Action and Alternative 2 and the removal of 16.64 acres

under Alternative 1 is offset by the enhancement of the 41 acre stand in High Meadows.

Table 3.8-9

Estimated 24" or Larger Tree Removal By Project

Project Name	Acres of Tree Clearing Required	Stand Location	Number of 24" or larger trees/acre	Estimated # of 24" or larger trees to be removed
Mid-Station Canopy Tour	1.91	Von Schmidt	9.8/acre	19
Forest Flyer	0.70	Von Schmidt	9.8/acre	7
Sky Cycle Canopy Tour	1.93	Von Schmidt	9.8/acre	19
East Peak Canopy Tour	1.48	Upper Nevada	9.1/acre	13
Sky Meadows Canopy Tour	4.12	Upper California	13.6/acre	57
Emergency Gondola Snowcat Evacuation Route	4.7	Von Schmidt	9.8/acre	46
Sky Basin Coaster (Alternative 1)	2.50	Upper California	13.6/acre	34
Total Proposed Action	14.84	--	--	161
Total Alternative 1 (No Forest Flyer)	16.64	--	--	188
Total Alternative 2 (No Sky Basin Coaster or Ropes Course)	14.84	--	--	161

61.1.7 Reasons For Tree Removal: Except for trees identified for retention under subsection 61.1.4, tree removal shall incorporate measures and prescriptions that promote a range of threshold standards and SEZs pursuant to subparagraph 61.1.6.C. Trees may be removed for the reasons provided below.

H. Tree Removal For Ski Areas And Rights-Of-Way: The following tree removal standards apply to ski areas and utility and public rights-of-way:

- (1) For expansion of ski areas, including but not limited to, the widening of runs and the addition or replacement of lifts, only the minimum number of trees necessary for the operation of the ski area shall be removed.

The Epic Discovery projects that require the removal of large trees include coasters, canopy tours, evacuation routes and structures associated with these activities. Each activity would remove the minimum number of large trees required to implement the project. The purpose and need for the Epic Discovery activities is provided in Chapter 1, Section 1.3 of this EIR/EIS/EIS. The proposed

facilities, by their very nature are proposed in a forested location that requires tree removal and cleared areas for safety. The evacuation route also requires trees to be removed to allow for emergency snow cat access during over the snow winter operations.

No Epic Discovery projects will result in the removal of late seral old growth forest habitat. As documented in the analysis in Chapter 3.8 (Figure 3.8-1) of the 2007 EIR/EIS/EIS, late seral forest exists within the Special Use Permit boundary, but none of the Epic Discovery projects or Alternatives require tree removal within mapped late seral forest.

CEQA and TRPA

Analysis: *Less Than Significant; Proposed Project and Alternatives*

No impacts to late seral/old growth forest would result from implementation of the Proposed Action or Alternatives. A maximum of 188 (Proposed Action and Alternative 2 - 161, Alternative 1 - 188) 24” dbh trees or larger have the potential to be removed. As the above findings have been made for tree removal in a Ski Area, and the facilities require the removal of large trees based on their linear nature or to meet safety requirements, this impact is considered to be less than significant.

NEPA

Analysis: *No Adverse Effect; Proposed Project and Alternatives*

No late seral old growth forest will be removed as a result of the Proposed Project or Alternatives. No adverse effects would result as the Record of Decision for the Sierra Nevada Forest Plan Amendment dictates that vegetation management standards and guidelines do not apply to recreation special use projects such as Ski Area Master Plans. Therefore, no adverse effects would occur as a result of the implementation of the Proposed Project or Alternatives.

IMPACT: **VEG-C1: Will the project have significant cumulative impacts to vegetation?**

The following analysis evaluates cumulative effects on an individual species basis from future Heavenly Mountain Resort Master Plan winter development. Quantitative analysis can only be completed for past, present, and future projects as it pertains to known occupied sites. Project areas that support suitable habitat for sensitive plant species but have not been surveyed are analyzed based on the assumption that the habitats would be lost, which would limit the potential for a species to expand the number of occupied sites. While sites with suitable habitat may be occupied, they do not contribute to the current status of the species and therefore would not likely influence a trend towards listing. The types of projects implemented within the Lake Tahoe Basin that may result in cumulative effects to suitable habitats and general forest types include:

- Fuels treatment projects may have direct and indirect impacts if a sensitive species is present; however, projects are not expected to alter the habitat to the degree that it can no longer support the species. Therefore, while fuels treatment projects may have immediate short-term impacts, they generally do not cause permanent loss of habitat. Fuels treatments (i.e. South Shore Fuels Reduction Project and Kingsbury Fuels Reduction Project) modify existing general forest types, but do not contribute to an overall loss or removal. Instead, these fuel treatments provide for better protection of general forest by reducing the chances of catastrophic wildfire.
- Restoration projects are designed to improve ecosystem function and habitat sustainability. While there may be negative short term direct effects, long term effects are hypothesized to be beneficial for sensitive species and therefore restoration projects generally do not result in negative cumulative effects. Restoration projects provide for enhancement of general vegetation types (i.e. riparian areas and general forest) and increase the overall acreage of these vegetation types.
- Ski lift construction and upgrade projects may cause immediate disturbance, fragmentation and permanent loss of sensitive species' habitats. There is potential for direct and indirect impacts to occur to individuals that may be present in project footprints. Once ski lifts are installed, suitable habitats often do not recover due to continued maintenance and modification of overstory canopy cover resulting in changes in microhabitat. Suitable habitat for rare plants often does not recover, as is the case with Tahoe draba (Putnam 2013). Ski lift construction results in a permanent loss of general forest types through direct removal. These projects contribute to the overall loss of forested areas and sensitive species habitats within Heavenly's operating area.
- Trail construction and upgrades (some with snowmaking installation) may cause permanent loss of habitat, due to the constant maintenance of the trails. Trails that are gladed instead of traditionally cleared reduce the amount of habitat loss; however, for this analysis, the assumption is that all trails would be traditionally cleared.
- Lodge construction and expansion may cause permanent sensitive habitat and general forest loss due to the installation of a permanent structure.
- Snowmaking projects may have direct effects to sensitive species if the equipment and pipelines are installed where plants are located. In addition, the increase in snow depths could indirectly affect species' reproductive success. However, most of these projects are located on existing trails where the majority of habitat for sensitive species has already been lost.

CEQA and TRPA

Analysis: *Less than Significant; All Action Alternatives*

Potential impacts to rare plant species may occur as a result of future projects, through the removal of habitat and the potential for direct removal of plants. The exact extent of the potential impacts cannot be determined due to a lack of site specific surveys for future Heavenly and non-Heavenly projects. While it is likely that future effects may occur from future Heavenly operations and implementation of future Heavenly winter Master Plan projects, these effects would be reduced due to compliance with existing standards and regulations, avoidance measures to be implemented with the development of each project, or habitat mitigation plans developed as part of future environmental documentation. Therefore, this potential cumulative effect is considered less than significant. Additionally, the mitigation monitoring plan includes the following measures to prevent the loss of special status plant species and their habitats in the future: 7.4-15 Minimize Removal/Modification of Deciduous Trees, Wetlands, and Meadows; 7.5-21 Protect Tahoe Draba Populations within Heavenly Mountain Resort; 7.5-22: Tahoe Draba Long-Term Conservation Strategy; 7.5-23: Minimize Loss/Degradation of Sensitive Plant Species; and 7.5-24 Noxious Weed Management.

NEPA

Analysis: *No Adverse Effects; All Action Alternatives*

Potential effects to rare plant species may occur as a result of future projects, through the removal of habitat and the potential for direct removal of plants. The exact extent of the potential effects cannot be determined due to a lack of site specific surveys for future Heavenly and non-Heavenly projects. While it is likely that future effects may occur from future Heavenly operations and implementation of future Heavenly projects, these effects would be avoided due to compliance with existing standards and regulations, avoidance measures to be implemented with the development of each project, or habitat mitigation plans developed as part of future environmental documentation. Additionally, the mitigation monitoring plan includes the following measures to prevent the loss of special status plant species and their habitats in the future: 7.4-15 Minimize Removal/Modification of Deciduous Trees, Wetlands, and Meadows; 7.5-21 Protect Tahoe Draba Populations within Heavenly Mountain Resort; 7.5-22: Tahoe Draba Long-Term Conservation Strategy; 7.5-23: Minimize Loss/Degradation of Sensitive Plant Species; and 7.5-24 Noxious Weed Management.